

Commentary

The Relationship between Physical Education Activity Programs and Academic Achievement

Colin G. Pennington ^{1,*}, Andrew Wolfe ¹¹ Department of Sport Science, School of Kinesiology, Tarleton State University, Stephenville, Texas, USA

*Correspondence: Colin G. Pennington (cpennington@tarleton.edu)

Abstract: The benefits of physical activity are immense and indisputable; however, the inclusion of Physical Education Activity Programs (PEAP) within the college setting, specifically the University Undergraduate Core Curriculum, is largely disregarded and viewed as unnecessary. Increased physical activity has shown to have a positive relationship throughout the human development process. Health promotion programs should target people of all ages, since the risk of chronic disease starts in childhood and increases with age. In addition to the physical activity benefits associated with human development, decrease disease rate, and extended lifespan, physical activity has also been thoroughly researched and documented to have positive effects on academic achievement. Despite the evidence identified through the results of the research, PEAP at the college level are consistently being ignored and removed from university undergraduate core curriculum. The purpose for university exclusion of PEAP is unknown; however, addressing the gap within the literature may provide justification for re-installment; research has not yet identified the impact of PEAP on the academic achievement of undergraduate students. A positive outcome could be gained by increasing the curricular value of compulsory PK-12 health and physical education requirements.

Keywords: Physical Education, Physical Activity, Academic Achievement**How to cite this paper:**

Pennington, C. G., & Wolfe, A. (2024). The Relationship between Physical Education Activity Programs and Academic Achievement. *Universal Journal of Sport Sciences*, 4(1), 10–14. Retrieved from <https://www.scipublications.com/journal/index.php/ujss/article/view/1067>

Received: July 13, 2024**Revised:** August 16, 2024**Accepted:** September 26, 2024**Published:** September 27, 2024

Copyright: © 2024 by the authors. Submitted for possible open-access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Beginning with the motor development processes of infants and adolescents progressing to sustained, functional abilities of the senior population, physical activity is a primary focus, essential aspect, and significant contributing factor of a healthy human lifespan (Boot et al., 1997; Blair et al., 1989; Lee et al., 2010; Wei et al., 1999; Warburton et al., 2006) [1-5]. Additionally, physical activity has been thoroughly researched and documented to have positive effects on academic achievement (Belch et al., 2007; Welk et al., 2010; Chomitz et al., 2009) [6-8]. The benefits of physical activity are immense and indisputable; however, the inclusion of Physical Education Activity Programs (PEAP) within the college setting, in this case the University Undergraduate Core Curriculum, is highly disregarded and viewed as unnecessary (Bourke et al., 2009) [9].

2. Benefits of Physical Activity

2.1. Human Development

Increased physical activity has shown to have a positive relationship throughout the human development process. Boot and colleagues (1997) [1] examined 500 children and adolescents ranging from 4-20 years of age and the influencing factors on their bone mineral density (BMD). Questionnaire administration determined the following factors: age, weight, height, puberty, calcium intake, prematurity, low birth weight, smoking, medical history, menarche, regularity of menstrual periods, use of oral contraceptives,

two or more fractures in the past, country of birth of both parents, use of vitamins or fluoride, and physical activity. The results of the study found no significant association between prematurity, low birth weight, smoking, two or more fractures in the past, use of oral contraceptives, or vitamin and/or fluoride intake, and BMD. However, a positive correlation ($p > 0.05$) was identified between physical activity in boys and lumbar spine and total body BMD. Additionally, an increased risk of low bone density levels is associated with inactive and overweight children. Both findings strongly suggest that physical activity is essential for children and adolescent development.

2.2. Disease

Warburton and colleagues (2006) [5] reviewed literature involving a relationship between physical activity and prevention of premature death, cardiovascular disease, diabetes, cancers, and osteoporosis. To accumulate the appropriate connecting literature Warburton and colleagues (2006) [5] utilized the following key terms: physical activity, health, health status, fitness, exercise, chronic disease, mortality, cardiovascular disease, cancer, diabetes, and osteoporosis. After reviewing and analyzing the literature, the study confirmed that regular participation in physical activity relates to the prevention of multiple chronic diseases (e.g., cancer, cardiovascular disease, depression, diabetes, hypertension, obesity, and osteoporosis). Furthermore, the results showed the greatest improvements in health status were identified when less-fit individuals became physically active and when individuals participated in physical activity beyond the recommended standards. Warburton and colleagues (2006) [5] suggest “health promotion programs should target people of all ages, since the risk of chronic disease starts in childhood and increases with age” (p. 807).

2.3. Mortality

Lee and colleagues (2010) [3] examined the influence of leisure-time physical activity and cardiorespiratory fitness on all-cause mortality. A questionnaire was administered to assess participants’ leisure-time physical activity levels. Cardiorespiratory fitness was measured by utilizing a maximal treadmill test. The results of physical activity and cardiorespiratory fitness levels were positively correlated to age in men and women ($p < 0.001$ for both). Results also recognized a significant inverse association with physical activity and mortality in men, but not women. However, cardiorespiratory fitness has a significant inverse association with mortality in both man and women, suggesting that cardiorespiratory fitness protocol should be implemented into physical activity programs.

Blair and colleagues (1989) [2] likewise, examined the effects of physical fitness on mortality in men and women. A preventive medical examination was administered, and physical fitness was assessed using a maximal treadmill exercise test. A follow-up examination was complete approximately eight years from initial examination which recognized 240 deaths in men and 43 deaths in women. The researchers reviewed the age-adjusted mortality rates and found a greater decline in mortality rate in men and woman identified as most-fit versus those identified as least fit. The results indicated and validated that physical fitness is an essential aspect and benefits an increased human lifespan.

2.4. Academic Achievement

In addition to the physical activity benefits associated with human development, decrease disease rate, and extended lifespan, physical activity has also been thoroughly researched and documented to have positive effects on academic achievement (Belch et al., 2001; Chomitz et al., 2009; Castelli et al., 2007) [6,8,10]. Castelli et al. (2007) [10] examined fitness levels and academic achievement of 259 public school students in third and fifth grades. To measure fitness levels, the researchers utilized the American College of Sports Medicine approved FitnessGram Test (Cooper Institute, 2014) involving the

following fitness tests: PACER, push-ups, curl-ups, sit and reach, and body mass index. The results of the fitness tests identified muscular fitness, aerobic capacity, and body composition (BMI; Pennington, 2023) [11]. Academic achievement was evaluated using the Illinois Standards Achievement Test, a routinely administered test for students in grades third through eighth which examines total academic achievement, mathematics achievement, and reading achievement. Pearson product-moment correlation analyses was applied to recognize the relationship between fitness levels and academic achievement of participants. The results of the study found that specifically, aerobic capacity scores were positively related to academic achievement, and BMI had an inverse relationship. The significant finding associated with this study suggests implementation of physical fitness is critical to maximize academic achievement.

A similar study conducted by Chomitz and colleagues (2009) [8] examined the physical fitness levels and academic achievement of fourth-, sixth-, and eighth-grade students from Massachusetts. Again, the Fitnessgram Test (Cooper Institute, 2014) was administered to assess fitness levels. Academic achievement was measured using the Massachusetts Comprehensive Assessment System. And again, the results identified a significant positive relationship between physical fitness levels and academic achievement.

Belch and colleagues (2001) [6] focused on a similar topic, physical fitness and academic achievement, but investigated a different population: college students. The researchers examined the access and utilization of Student Recreation Complex (SRC) by requiring freshman students to scan their identification card prior to entry into the facility. The number of scans per semester was recorded, which established SRC usage. Belch and colleagues (2001) [6] related SRC usage to the students' first-semester grade point average (GPA), first-year cumulative earned hours, and persistence rates. The results of the t test analysis showed a significant difference between users and nonusers. Users had a significant increase in first-semester GPAs, first-year cumulative earned hours, and persistence rates. Although the age of the subjects increased compared to previously reviewed studies, the results remained the same: increased participation in physical activity equals an increase in academic achievement.

3. Conclusion

Despite the evidence identified through the results of the research, PEAP at the college level are consistently being ignored and removed from university undergraduate core curriculum. Bourke and colleagues (2009) [9] examined the core curriculum of 50 institutions in America. Multiple core curriculum courses were parallel among the institutions; however, core required physical education courses were present in just over half of the colleges (52%). Among the top 25 ranked researcher institutions, only nine universities required physical education in the core curriculum (36%). Of the top 25 liberal arts institutes, 17 (68%) include physical education within the core, but the general requirements were appallingly limited to passing a swim test and/or enrolling in one or two physical education courses. The 17 liberal arts institutions believed physical education "... provide for a more holistic or whole-body approach..." (Bourke et al, 2009, p. 229) [9] and evidence from previously reviewed research provides support to these beliefs. However, the overall results exemplified limited incorporation of physical education, which illuminates an issue of ignorance towards the benefits of physical education and physical activity.

3.1. Call-to-Action

As discussed throughout this review of literature, the benefits of physical activity are immense and indisputable: physical activity influences and affects essential aspects of human development, learning, and lifespan. However, the inclusion of PEAP within the college setting, in this case the university undergraduate core curriculum, a critical

developmental and learning stage of life, is highly disregarded and viewed as unnecessary (Bourke et al., 2009) [9]. The purpose for university exclusion of PEAP is unknown; however, the addressing the gap within the literature may provide justification for re-installment: research has not yet identified the impact of PEAP on the academic achievement of undergraduate students.

It has been documented that more options are needed for college students to learn the principles of health and wellness through college physical activity courses (Pennington, 2022; Pennington & Wolfe, 2022a) [12,13]. Naturally this philosophy could be extended to college faculty and staff (McEntyre et al., 2020) [14], but a greater positive effect could be gained by increasing the curricular value of compulsory PK-12 health and physical education requirements (Pennington, & Sinelnikov, 2018; Pennington 2019; Pennington, 2020ab; Pennington & Nelson, 2020; Pennington et al., 2022; Pennington & Wolfe, 2022b) [15-21].

References

- [1] Boot, A. M., de Ridder, M. A., Pols, H. A., Krenning, E. P., & de Muinck Keizer-Schrama, S. M. (1997). Bone mineral density in children and adolescents: Relation to puberty, calcium intake, and physical activity 1. *The Journal of Clinical Endocrinology & Metabolism*, 82(1), 57-62. doi:10.1210/jcem.82.1.3665.
- [2] Blair, S. N., Kohl, H. W., Paffenbarger, R. S., Clark, D. G., Cooper, K. H., & Gibbons, L. W. (1989). Physical fitness and all-cause mortality: A prospective study of healthy men and women. *The Journal of the American Medical Association*, 262(17), 2395-2401. doi: 1989.03430170057028.
- [3] Lee, D. C., Sui, X., Ortega, F. B., Kim, Y. S., Church, T. S., Winett, R. A., Ekelund, U., Katzmarzyk, P. T., & Blair, S. N. (2010). Comparisons of leisure-time physical activity and cardiorespiratory fitness as predictors of all-cause mortality in men and women. *British Journal of Sports Medicine*, 45, 504-510. doi: 10.1136/bjism.2009.066209.
- [4] Wei, M., Kampert, J. B., Barlow, C. E., Nichaman, M. Z., Gibbons, L. W., Paffenbarger Jr., R. S., & Blair, S. N. (1999). Relationship between low cardiorespiratory fitness and mortality in normal-weight, overweight, and obese men. *The Journal of the American Medical Association*, 282(16), 1547-1553. doi:10.1001/jama.282.16.1547.
- [5] Warburton, D. E., Nicol, C. W., & Bredin, S. S. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal*, 174(6), 801-809. doi:10.1503/cmaj.051351.
- [6] Belch, H. A., Gebel, M., & Maas, G. M. (2001). Relationship between student recreation complex use, academic performance, and persistence of first-time freshmen. *Journal of Student Affairs Research and Practice*, 38(2), 220-234. doi:10.2202/0027-6014.1138.
- [7] Welk, G. J., Jackson, A. W., Morrow Jr., J. R., Haskell, W. H., Meredith, M. D., & Cooper, K. H. (2010). The association of health-related fitness with indicators of academic performance in Texas schools. *Research Quarterly for Exercise and Sport*, 81(3), 16-23.
- [8] Chomitz, V. R., Slining, M. M., McGowan, R. J., Mitchell, S. E., Dawson, G. F., & Hacker, K. A. (2009). Is there a relationship between physical fitness and academic achievement? Positive results from public school children in the northeastern United States. *Journal of School Health*, 79(1), 30-37. doi:10.1111/j.1746-1561.2008.00371.x.
- [9] Bourke, B., Bray, N. J., & Horton, C. C. (2009). Approaches to the core curriculum: An exploratory analysis of top liberal arts and doctoral-granting institutions. *The Journal of General Education*, 58(4), 219-240. doi:10.1353/jge.0.0049.
- [10] Castelli, D. M., Hillman, C. H., Buck, S. M., & Erwin, H. E. (2007). Physical fitness and academic achievement in third-and fifth-grade students. *Journal of Sport and Exercise Psychology*, 29(2), 239.
- [11] Pennington, C. G. (2023). Using FitnessGram to Measure the Impact of 'Lost' Physical Education During the COVID Years. *International Journal of Physical Education, Fitness and Sports*. (12)3, 59-68. DOI: <https://doi.org/10.54392/ijpefs2336>.
- [12] Pennington, C. G. (2022). More Options Needed in College Physical Education and Activity Courses. *The Sport Digest*. July 19, 2022. ISSN: 1558-6448.
- [13] Pennington, C. G. & Wolfe, A. (2022a). A Reimagining and Revision of University Physical Activity Course Offerings. *Curriculum and Teaching Methodology*. 5(3), 53-62. <https://www.clausiuspress.com/article/3673.html>.
- [14] McEntyre, K., Brock, J. D., Pennington, C. G., Wolfe, A., & Peak, K. (2020). Building a culture of health: A university model for employee wellness. *Journal of Advances in Sports and Physical Education*. 3(10), 1-4. DOI: [10.36348/jaspe.2020.v03i10.00X](https://doi.org/10.36348/jaspe.2020.v03i10.00X).
- [15] Pennington, C. G., & Sinelnikov, O. A. (2018). Using Sport Education to Promote Social Development in Physical Education: Column Editor: K. Andrew R. Richards. *Strategies*, 31(6), 50-52. <https://doi.org/10.1080/08924562.2018.1516447>.
- [16] Pennington, C. G. (2019). Sport Education and Physical Activity: Recommendations for Maximizing the Model. *International Journal of Physical Education, Fitness and Sports*. 8(1), 122-125. <https://doi.org/10.26524/ijpefs19114>.
- [17] Pennington, C. G. (2020a). Applying the Health-Related Fitness Model and CSPAP to Address Physical Activity Concerns in Physical Education. *Journal of Physical Fitness, Medicine & Treatment in Sports*, 68(1), 6-8. DOI: [10.19080/JPFMTS.2020.08.555730](https://doi.org/10.19080/JPFMTS.2020.08.555730).

-
- [18] Pennington, C. G. (2020b). Models based instruction: The Sport Education curriculum model and accruing physical activity. *Curriculum and Teaching Methodology*. (3), 1-10. DOI: [10.23977/curtm.2020.030101](https://doi.org/10.23977/curtm.2020.030101).
- [19] Pennington, C. G. & Nelson, L. (2020). Physical Activity Contribution of a Modified “Dancing Classrooms” Pilot on Middle School Students Using Accelerometer Technology and Heart Rate Telemetry. *The Physical Educator*. 77(2), 230-256. <https://doi.org/10.18666/TPE-2020-V77-I2-9794>.
- [20] Pennington, C. G., Shiver, T., McEntyre, K., & Brock, J. (2022). Physical Education Preservice Teachers’ Perspectives on Teaching Health-Related Fitness. *The Physical Educator*. 79, 117-130. DOI: [10.18666/TPE-2022-V79-I2-10214](https://doi.org/10.18666/TPE-2022-V79-I2-10214).
- [21] Pennington, C. G. & Wolfe, A. (2022b). An Analysis of Physical Education Requirement in Texas: The Trend from Kindergarten Through Higher Education. *Curriculum and Teaching Methodology*. 5(3), 63-74. <https://www.clausiuspress.com/article/3674.html>.