



## Original Article

### The Role of Physical Education in Shaping Healthy Lifestyle Choices: Encouraging Lifelong Physical Activity and Wellness in Students

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*In this empirical investigation-writing, the fundamental impact of physical education (PE) based on whether students will engage in healthy behaviors throughout the course of their lifetimes, including physical activity, or not is for the most part established, as is the aim of the research, specifically: How does physical education influence students' physical activity, motivation and health? The aim of this study is to investigate the long-term effects of PE on the students who take it and especially under the scope of promoting and developing the behavior that is conducive to a healthy lifestyle, where the major hypothesis is that the PE most greatly influences students' attitudes toward physical activity and health. Using a mixed-methods approach, the study design incorporated qualitative interviews and quantitative surveys with middle/high school students, PE teachers, and school administrators to provide a well-rounded examination of the impact of PE on longer-term physical activity, health knowledge, and wellness. A total of 500 students from three different schools participated in the study, with the data gathered through self-reported questionnaires focused on their fitness, physical activity levels, attitudes and lifestyle — Jan 16a and semi-structured interviews exploring the perspectives of PE teachers and administrators surrounding PE's influence on students' health behaviours. Important results showed that students who took part in thorough, methodologically robust PE programs are more motivated to remain physically active, possess higher levels of knowledge about health behaviours, and are more likely to continue exercising outside the school environment (particularly when health education and self-directed goal setting are integrated into PE programs).*

*The research also establishes a strong link between teacher involvement with the positive contribution of creating an enriched supportive environment for lifelong wellness, stating that sport environments that have good promotion and positive reinforcement and that have personalized fitness plans are more effective for students in the long run. The study results show that PE has an important impact on establishing habits among students that motivate them to make healthier lifestyle choices long-term and the authors conclude that PE curriculum and programs must incorporate health education and fitness participation to help students develop and maintain a lifelong commitment to health and physical activity. Evidence-based PE: a powerful tool for obesity prevention: The potential value of the paper: The implications of the data for curriculum development, teacher training, and school policy are profound, and this research advocates for the use of an evidence-based approach to influencing student health behavior.*

**Keywords:** Physical education (PE), Healthy lifestyle choices, Lifelong physical activity, Student wellness, Health behaviors, Motivation and engagement

#### Introduction

#### Background and Rationale

Physical education (PE) has long been recognized as a key component of a well-rounded education, yet its potential to shape students' health behaviors and influence long-term wellness outcomes has only recently gained widespread attention.

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As childhood obesity rates continue to rise globally, with recent studies indicating that nearly 1 in 5 children and adolescents are obese in the United States alone (CDC, 2021), coupled with the increasing prevalence of mental health challenges such as anxiety and depression, the need for effective interventions that promote physical activity and healthy living has never been more urgent (Guthold et al., 2020). The growing concerns over sedentary lifestyles, exacerbated by the increased use of digital devices and decreased physical activity, have resulted in a generation of students who are less active and more vulnerable to the physical and mental health issues associated with inactivity (Pate et al., 2013). In this context, PE plays a vital role in combating these negative trends by providing students with opportunities to engage in regular physical activity, learn about healthy habits, and develop lifelong wellness skills. PE programs that integrate physical fitness with education on nutrition, mental health, and wellness can help mitigate these issues by not only improving students' physical fitness but also influencing their attitudes toward maintaining healthy behaviors beyond the school environment, ultimately laying the foundation for a lifetime of active living (Naylor & McKay, 2009). By promoting positive health behaviors and offering an inclusive environment where all students can participate and succeed, PE can serve as a preventive measure against chronic diseases such as obesity, heart disease, and type 2 diabetes, while also addressing the growing mental health crisis (Janssen & LeBlanc, 2010).

## Research Problem

Although physical education (PE) is acknowledged as an effective vehicle for promoting physical activity and positive health-related behaviors in children, evidence is limited regarding the long-term influence of PE on student health behaviors and subsequent adoption of life-long physical activity and wellness habits. This research tackles the issue of how physical education (PE) programs play an important role in building a foundation of lifelong healthy lifestyle habits among students with an emphasis on physical activity, nutrition and mental health and aims to examine the impact of PE on the development of sustainable lifestyle choices that continue into adulthood. Although physical education (PE) is an integral part of school-based health education, the extent to which these short-term, school-based programs can promote enduring changes in students' attitudes and behaviors is uncertain due to potential shortcomings, such as limited curriculum time, patchy program implementation and quality, and inequitable availability of resources across schools. The research will explore if, and how, PE can catalyze lifelong participation in physical activity and wellness behaviours in the school and beyond; behaviours that become embedded in students' lives.

## Purpose of the Study

This work seeks to understand the impact of PE programs on students' attitudes toward physical activity, nutrition, and overall wellness, and the correlation between the presence of strong PE programs on health behaviors of students over time. In particular, the purpose of the research project is to explore the potential of PE to promote healthy behaviours outside of school, through the identification of the determinants of long-term participation in physical activity, healthy dietary habits and mental health. This investigation will also explore the impact that PE educators have on students' perceptions/attitudes towards wellness, and curriculum/pedagogy can provide the environment needed to enable and encourage the process of developing lifelong attributes for physical activity/fitness and health. The study aims to gain insights into the mechanisms of impact between PE and students' health behaviours, which can contribute to the development of more effective PE programmes promoting lifelong physical activity and well-being.

## Research Questions

The study will address the following research questions:

1. How do physical education programs influence students' long-term health behaviors, including physical activity, nutrition, and mental health?
2. What role does physical education play in fostering lifelong habits of physical fitness and well-being?
3. How can physical education educators encourage and sustain healthy lifestyle choices through curriculum and pedagogy?

## Significance of the Study

This study can provide knowledge information for the academic world of physical education which is important and relevant for the implementation of health promotion in schools. Attention to detail: As part of being detail-oriented, our multi-disciplinary and multi-method research will guide the creation of improved PE curricula that complement physical fitness instructional focus with health education strategies aimed at these behaviours, by providing prospective longitudinal evidence of the lasting effect of PE on student's health behaviours. In summary, our results are of considerable relevance for school leadership and policymakers who want to favour health outcomes in students by reinforcing the importance of PE for the promotion of life-long health. This research will assist in the design of more inclusive and holistic PE programs that meet the needs of students in a more comprehensive manner, promote continued participation in physical activity, and have the potential to reduce the incidence of chronic diseases over the life course by detailing the factors that encourage long-term participation in exercise and physical activity related healthy lifestyle behaviours. The study results could also help steer policies on where PE can play a role in

larger health policy efforts at the school level to ground broader school policies in a more coherent and comprehensive student wellness strategy that promotes life-course physical and mental health overall.

## **Literature Review related to the study**

### **The Importance of Physical Education in Health**

Physical education (PE) plays a crucial role in fostering students' physical, mental, and social development, as it not only enhances physical fitness but also cultivates critical life skills such as teamwork, discipline, and resilience, all of which contribute to the overall well-being of students (Graham, Holt/Hale, & Parker, 2017). Numerous studies have highlighted the significant impact of PE in promoting healthy behaviors, such as physical activity, healthy eating, and stress management. Research has demonstrated that consistent participation in PE helps students develop the necessary skills to engage in lifelong physical activity, which can reduce the risk of chronic conditions like obesity, cardiovascular disease, and type 2 diabetes (Janssen & LeBlanc, 2010). In addition to physical fitness, PE provides a platform for addressing mental health, particularly in the context of stress management, by promoting physical activity as a means of reducing anxiety and improving mood (Naylor & McKay, 2009). Furthermore, PE classes often provide opportunities for students to learn about healthy eating habits and their importance in supporting overall health, which can contribute to better nutritional choices outside of school (Pate et al., 2013). Beyond the individual benefits, PE also fosters social development by encouraging collaboration and communication among peers, thus improving students' interpersonal skills and social well-being (Macdonald & Kirk, 2021).

### **Physical Education and Lifelong Wellness**

Studies have shown that the benefits of physical education reach beyond the classroom, with early exposure to PE programs dramatically increasing the chances of life-long participation in physical activity. According to Pate et al. (2013) increased physical activity through structured physical education (PE) in childhood is also associated with sustained physical activity in adulthood integrated physical literacy in childhood results in increased levels of physical activity, better cardiovascular health and other parts of health in early adulthood. Research by Eime et al. That belief is further supported by Bailey et al (2013) who found that PE can play an important role in developing positive attitudes to physical activity that will help when students are introduced to lifelong fitness habits and lifelong health behaviours. PE can not only contribute to lifelong physical fitness, but also to the development of healthy habits including making healthy nutrition choices and stretching when they are stressed, which are important factors of lifetime wellness (Trost et al., 2002). Moreover, PE programs that teach fitness as a lifetime endeavor, as opposed to a sport or a game oriented, instill in students an instinct to incorporate physical activity into their daily lives, helping to decrease the chances that children will completely lose interest in exercise when they age.

## **Methodology related to the study**

### **Research Design**

A mixed-methods research design was applied incorporating a combination of quantitative and qualitative data collection instruments identifying PE as a contributor to the healthy lifestyle choices and lifelong wellness of students (Murphy et al., 2019). The quantitative part is used to evaluate the effect of PE on students' physical activity, fitness outcomes, and health behaviours using pre- and post-intervention fitness assessments and the qualitative results are used to gain information about student attitudes toward physical activity, nutrition, and general health and wellness and to gather feedback regarding their experience from PE teachers and school health staff using surveys and interviews. The use of mixed-methods facilitates methods triangulation (Creswell, 2014), providing quantitative data on physical health and qualitative data on personal and social factors contributing to students' health behaviours thus presenting a fuller picture of the potential role of PE in forming sustained healthy habits.

### **Participants of the study**

The study includes a total of 500 students, ranging in age from 12 to 16 years, selected from five public middle and high schools across diverse geographic and socio-economic backgrounds. The participants represent a mix of genders, ethnicities, and socio-economic statuses to ensure a representative sample of the student population. Inclusion criteria for the study required students to be enrolled in the PE curriculum, with no prior physical disabilities or medical conditions that would hinder participation in physical activities. Exclusion criteria included students who had opted out of PE classes, those who had significant health restrictions preventing participation, and those who had transferred in or out of the school during the academic year, as their inclusion could lead to inconsistencies in longitudinal data collection. This broad demographic ensures that the study reflects the diverse experiences and needs of students in typical school settings, while also allowing for an analysis of how PE programs affect various student groups (Macdonald & Kirk, 2021).

### **Instruments and Tools**

The methods of data collection in this study include survey, fitness test and semi-structured interview. The surveys aimed to evaluate students' attitude toward physical activity, nutrition and general health behaviors; Likert

scale questions were used to assess the effectiveness of PE to support healthy lifestyle habits, and self-reported physical activity behavior. Qualitative data were also collected from interviews with PE teachers, school health staff, and a subsample of students ( $n=30$ ) to explore the effects of PE on students' attitudes related to physical fitness and wellness. The fitness assessments comprised both commonly used indicators of students' physical activity behaviours (i.e. daily steps from pedometers and fitness trackers) as well as objective aerobic capacity (VO<sub>2</sub> max) and strength test scores collected at baseline and follow-up, which afford rigorous evidence of physical activity impacts. The physical health impact of PE was also measured on health outcomes like body mass index (BMI). Tools were all developed using existing validated measures within the health education/physical activity field.

## Data Collection Procedures

The data were collected over a 12-week period in the fall semester, and primary data collection activities took place in two phases: the baseline phase and the post-intervention phase. During the baseline phase, fitness assessments were completed with all participants, and surveys were also administered to evaluate students' initial attitudes and practices regarding PA, nutrition, and wellness. PE teachers and school health staff were interviewed to ascertain their perspectives on the impact of PE on students' health practices. At the end of the 12-week intervention, which consisted of regular PE classes supplemented by wellness education, post-intervention fitness assessments were also completed and surveys were readministered or applied in complete form to students. Also, semi-structured interviews were conducted with the same students as in pre-intervention interviews to identify changes in participants' perceptions and practices related to PA and health practices as a result of PE. All data collection activities were performed during PE classes or, if possible, during after-school health education classes; as a result, each activity was completed in the individual's ordinary educational context.

## Data Analysis Methods

Descriptive statistics, paired t-tests, and ANOVA were applied to analyze the quantitative data for any significant changes in students physical activity levels, fitness scores, and health outcomes from baseline to post-intervention. T-tests were utilized to determine mean differences in number of steps taken, BMI and fitness scores and ANOVA was used when comparing outcomes across age, sex, or socio-economic background. Qualitative data were analyzed using thematic analysis in which responses were coded and redescribed in terms of recurrent themes and patterns related to students' perceptions of PE and health behaviour (Braun & Clarke, 2006). Here, key predictors of students' participation in physical activity comprising, perceived barriers, and facilitators including teacher support, peer support, and the applicability of PE content to their lives were highlighted through the analysis. The quantitative and qualitative data triangulation provided a broad understanding of the role of PE programs in students physical, mental, and social development, and how these programs might be maximized to support lifelong health and wellness (Pate & al., 2013).

## Results related to the study

### Quantitative Findings

The qualitative findings showed improvement in physical fitness, physical activity levels, and students' health behaviors after participating in PE programs, while the analysis of quantitative data revealed similar results. The data-driven PE program (experimental group) positively affected the fitness assessment data (step counts, body mass index (BMI), and aerobic capacity) of students as compared to students in traditional PE programs (control group). Students in the experimental group were significantly more active than their counterparts in the control group ( $t(220) = 8.47, p < 0.001$ ) taking an average of 6,000 steps per day at baseline up to 7,680 steps per day post-intervention—the 28% increase at post-intervention for the experimental group compared to only a 5% increase (6,200 to 6,510 steps per day) for the control group. According to BMI data, students in the experimental group experienced a 1.5% reduction in BMI as an average versus a 0.4% reduction in BMI for the control group. Aerobic capacity (measured in VO<sub>2</sub> max) was similarly increased post experimental treatment when comparing pre and post test comparisons ( $M = 45.3, SD = 5.2$  to  $M = 47.6, SD = 4.8$ ), whereas the control group only showed a modest  $t(220) = 4.61, p < 0.001$  increase ( $M = 46.1, SD = 5.4$  to  $M = 46.9, SD = 5.3$ ) compared to pretests. Our findings indicate that innovative PE programs involving technology and wellness education yield larger improvements in physical fitness and health behaviours of schoolchildren. The analysis of student surveys showed that there were marked shifts in student attitudes with regard to physical activity and healthy eating. Eighty-five percent of students found in the experimental group indicated their motivation to be active out of school increased, compared to 60% in the control group [ $\chi^2(1, N = 500) = 15.22, p < 0.01$ ] Likewise, healthy eating habits were also perturbed as 78% of the students from the experimental group stated they had become more aware of their nutritional intake with the increase of fruit and vegetable consumption by 18% in compare to just 45% students from the control group who reported to have changed their eating habits. The results indicate that PE programs that promote wellness are associated with increased physical fitness and healthy lifestyle choices as evidenced by increased physical activity and better nutrition.

## Qualitative Findings

Qualitative data came from interviews and surveys to give insights into the positive and negative roles students and PE teachers thought PE played in physical activity behaviours, healthy eating and emotional wellbeing. From the interviews several themes emerged, positive influence of PE on students' motivation in adopting healthy behaviors. Physical Education Teachers reported a higher activity engagement and a positive change in students' attitude toward fitness. As one PE teacher put it: "The kids are much more excited about being active now they follow how many steps they take or how many burpees they do, and they set personal targets, and just feel really empowered by the data." The personalized feedback and opportunities to set physical activity goals provided by the PE program also promoted out-of-school physical activity motivation among students. As one pupil put it: "I never really liked PE but when I used the fitness tracker I could see how much better I was getting, I wanted to carry on." Along with movement, students reported that PE also influenced mental and emotional health positively. Students' behaviours when interviewed indicated that the PE activities made them feel calmer and increased their confidence. Another student said: "PE helps me get rid of some stress and helps me feel better about myself when I see I am improving." They also noted an increase in self-confidence and a more positive approach to physical activity that could be attributed to the enhanced tailoring and supportive environment of the innovative PE program. Students in the experimental group also reported greater satisfaction with their PE classes; 90% of students in the experimental group rated the program as "motivating" or "engaging" while only 60% of students in the comparison group did so.

## Discussion related to the study

### Interpretation of Results

The findings of this investigation strongly support the notion that physical education (PE) serves as a foundation for positive health behaviors in students and for lasting health outcomes consistent with the hypothesis that PE cultivates healthy habits that carry on outside the classroom. The results, notably the effect sizes specific to the significant increase in physical activity levels, fitness outcomes, and health behaviors in the experimental condition, indicated PE programs focused on personalized learning, contingent use of technology, and wellness-related lessons can effectively promote favorable attitudes toward physical activity, nutrition, and general well-being in students. Consistent with respect to the first research question, which examined the effect of PE on students' longer-term health behaviors outside school in the longer term, students receiving the data-driven PE program engaged in substantially more physical activity at follow-up (28% more steps per day) compared to a modest increase of 5% in the control group (the active feedback from the wearable devices and fitness apps the students received drove them to lead more active lives). Also, the data validated the second research question, which related to the contribution of PE to lifelong habits of fitness, as the experimental group exhibited improvements in aerobic capacity and a reduction in BMI as measures of physical health over time. Meanwhile, 78% of students in the experimental group said they had a better idea of how to eat healthy, which may support the argument that PE programs that incorporate wellness education lead students to make better nutritional choices an idea that also adds to the argument that PE can help promote healthy habits that go beyond physical fitness. With respect to the third research question related to the role of PE educators in sustaining these behaviors, teachers in the experimental group employed data-driven tools to appropriately tailor activities to individual students, which builds a supportive environment where students felt empowered to pursue and achieve their health-related goals, consistent with best practices in personalization (Macdonald & Kirk, 2021). These findings are consistent with the limited research which suggests that physical education provides a strong setting for encouraging long-term physical activity and creating positive health behaviors in the young (Trost et al., 2002).

### Implications for Physical Education

The results of this study provide important insights for PE teachers and curriculum designers. In order to be able to promote healthy lifestyle decisions in students, PE programs have to change from a sport-based model, which focuses on skills and competition. Personalization is not new, but the use of data-driven tools, such as wearables and fitness apps, can help PE programs engage students by moving each individual closer toward relevant forms of feedback, tracking, and individual goal setting. Additionally, wellness education should be integrated into PE by including lessons on nutrition, stress management, and mental health, since those were significant contributors to sustainable health behaviors in the experimental group. PE teachers must also be trained to integrate these elements into their lessons for a more holistic approach to overall student wellness. Some of the best practices determined in the study were establishing a goal and providing feedback throughout the exercise, along with an environment where all levels of fitness felt comfortable to participate, and could achieve the results needed to succeed. Such strategies engaged them and made physical activity more enjoyable, thus encouraging the development of habits that can last a lifetime. And it also highlights the need for aligning pe with overarching school health policies that support physical activity, nutrition, and mental health to provide a well-rounded blueprint for student health and wellness (Guthold et al., 2020).

## Limitations of the Study

Although the study raises important points about the role of PE in building healthy behaviors, it should be noted that it has limitations. This analysis has very big limitations on its sample size because it is enough for this study, but not sufficient for the huge set of student population of regions and type of school's areas. In our case, a larger and more representative sample may better reflect the validity of these findings. The study also relied on self-reported surveys and interviews that may be biased or inaccurate, especially among students self-reporting their physical activity and dietary habits. For example, participants' accelerometer data or dietary logs which are more objective measures may help make findings smoother. In addition, the duration of the study (12 weeks) means that longer-term follow-up is needed to determine the lasting influence of PE on health behavior, as it may take several months or longer for lifestyle changes to emerge. Lastly, it is also possible that external factors, such as extracurricular activities, family habits, and societal influences (eg, technology use and media exposure), may have accounted for the results, given that these factors were not completely controlled for the design of the study. Further study, employing longitudinal designs, larger samples, and a broader assessment of environmental factors is needed to overcome these limitations (Janssen & LeBlanc, 2010).

## Recommendations for Future Research

Depending on the encouraging results of this study, the long-term effect of PE with the adult health behaviour (the physical activity maintenance albeit the nutrition behaviours and the mental health) should be investigated. Longitudinal studies that track students into adulthood may help illuminate the long-term impact of PE on lifelong wellness. Further work should seek to identify concrete avenues for improving PE programs, especially in schools characterized by lower access to technology and wellness resources. It would also be beneficial to explore ways to better incorporate mental health education into PE programs, as conventional PE curricula often neglect the mental and emotional benefits of physical activity. Lastly, looking at how PE curricula may be designed to recognize different needs amongst students, particularly for those with disabilities or special educational needs, will be critical for allowing all students to realise the potential of PE in aiding the implementation of healthy lifestyle choices (Pate et al., 2013).

## Conclusion

This study highlights the significant role that physical education (PE) plays in shaping healthy lifestyle choices and fostering lifelong physical activity and wellness habits, demonstrating that students who participated in a data-driven, wellness-focused PE program experienced substantial improvements in physical activity levels, fitness outcomes, and health behaviors, with the experimental group showing a 28% increase in daily steps, greater reductions in body mass index (BMI), and improved aerobic capacity compared to the control group, as well as a significant increase in students' awareness of healthy eating habits and a greater likelihood of sustaining physical activity beyond school hours, supporting the view that PE is not only an avenue for physical fitness but also a vital mechanism for promoting holistic wellness (Troost et al., 2002); these findings underline the importance of integrating technology and wellness education into PE programs, as real-time data tracking and personalized feedback were identified as key factors in motivating students to set personal health goals, engage in healthier behaviors, and increase their overall participation in physical activity, contributing to long-term improvements in students' physical, mental, and social well-being, as evidenced by the positive psychological impacts reported by students, including reduced stress levels and increased self-esteem, which further supports the notion that PE can foster emotional and psychological benefits that enhance students' quality of life (Naylor & McKay, 2009); the study also underscores the need for PE curricula to incorporate a more comprehensive approach to wellness, integrating education on nutrition, mental health, and stress management, in order to better prepare students for lifelong healthy habits, as students who received this holistic approach reported significant improvements in their attitudes toward health, physical activity, and eating habits, reinforcing the notion that PE should not be viewed merely as a space for physical activity but as an essential educational platform for promoting lifelong wellness (Guthold et al., 2020); the implications of these findings for school policies are clear, as they suggest that PE should be prioritized in the curriculum, supported by professional development for PE teachers on how to use technology to foster engagement and promote health literacy, and integrated with broader school wellness programs that promote physical activity and healthy lifestyles, ensuring that PE serves as a cornerstone for students' long-term health (Macdonald & Kirk, 2021); finally, while the study demonstrates promising results, future research should focus on the long-term effects of PE on students' health behaviors into adulthood, the integration of more diverse pedagogical strategies in PE programs, and the ways in which PE can be adapted to address the needs of students with different learning and health profiles, as well as exploring how to ensure equitable access to high-quality PE programs across schools with varying resources (Pate et al., 2013).

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