Utilizing Movement in the Secondary Classroom

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Abstract

Few individuals would contest research suggesting physical activity is essential for the healthy development of children. Movement stimulates growth and supports their physical, cognitive, social, and emotional progression, but many are quick to forget the benefits of physical activity for adolescent students. Physical activity is continually being limited in secondary education, and it is preventing students from achieving their full potential. Evidence suggests the implementation of physical activity into the classroom environment not only supports academic achievement but also social and emotional development. The following review of literature will address these benefits as well as the barriers preventing educators from implementing activities that utilize movement and suggest practical applications for educators looking to implement classroom-based physical activity.

Keywords: Movement Breaks, Classroom-Based Physical Activity, Physical Activity.

Utilizing Movement in the Secondary Classroom

Chapter One: Introduction

Many adults remember the care-free days of their youth, chasing peers around the school yard at recess and making friends as they traversed the jungle gym, slid down the slide, or swung through the cool, fresh air on the swing set. As students approach their middle and high school years, these activities slowly fade and are replaced with more sedentary behaviors, fewer opportunities for movement, and less physical activity. Physical activity is an essential aspect of development for children of all ages, but many underestimate the importance of movement for secondary students. According to the United States Department of Health and Human Services, students ages 6 to 17 should exercise for 60 minutes per day (U.S. Department of Health and Human Services, 2018); however, as students age, opportunities to remain active while at school are reduced, physical education requirements are lessened, recess and time outside is minimized or eliminated altogether, and most students' educational experiences consist of sitting in a square desk and listening to lectures.

When examining secondary education and the lifestyles of many adolescent and teenage students, it is not difficult to see why a decrease in physical activity occurs. As students age, school schedules become more rigid, academic rigor increases, and students are bombarded with opportunities to fill their already hectic days. Mounting social, parental, and peer pressures contribute to schedules that leave no time for physical activity, and students are expected to carve out these moments on their own. In this important transition from adolescence to young adulthood, research suggests students' lifestyles have become increasingly sedentary (Dumith et al., 2011, as cited in Coimbra et al., 2021). In a stage of development that is so critical for

creating healthy habits it is of the utmost importance for educators to support their students through the inclusion of movement in the classroom.

Importance of the Topic

In a poll conducted by the Harvard School of Public Health (HSPH), 25% of families believed their child's school was not providing enough opportunities for physical activity. Parents of students at the secondary level were found to be more likely to grade their child's school poorly in this area, corroborating the idea that students are given fewer opportunities to remain active as they move through their education (Harvard School of Public Health, 2013). As opportunities for students to participate in physical activity continually decrease – especially at the secondary level – it is important for educators and the general public to understand the positive impact movement has on a student's social, emotional, physical, and cognitive development. Positive outcomes associated with the implementation of physical activity in the classroom include improved cognitive health (Hillman et al., 2005; Fedewa et al., 2018), academic achievement (Iri et al., 2017; Fedewa et al., 2018; Warehime et al., 2019), increased motivation, improved coping skills, and greater self-efficacy (Rodríguez de Souza et al., 2014; Coimbra et al., 2021).

A landmark study conducted by Hillman et al. (2005) discussed the significance of physical activity in supporting the cognitive functions of young people. They found adolescents with higher levels of physical activity to possess better overall cognitive functions, such as working memory and attention spans. Fedewa et al. (2018) discussed similar findings, stating the inclusion of movement breaks in the classroom environment resulted in better cognitive functions. Improved cognitive functions can equate to higher academic performance and is associated with behaviors exhibited by high achieving students.

Studies conducted by Iri et al. (2017), Fedewa et al. (2018), and Warehime et al. (2019) highlight the connections between physical activity and academic achievement. Fedewa et al. (2018) found movement breaks infused into content learning not only improved the cognitive functions of students, but they also accounted for greater academic achievement in math and reading. Iri et al.'s (2017) findings corroborated this discovery, asserting the physical activity levels of secondary students were determinative in their academic success.

Motivation, self-efficacy, and coping skills all impact an individual's ability to succeed in the classroom. Although Coimbra et al. (2021) approached the use of physical activity from the physical education perspective, there are still lessons to be gleaned from their research and applied to the classroom. Coimbra et al. (2021) employed behavioral skill training and found it can significantly improve the motivation, self-efficacy, and coping skills of adolescents. Rodríguez de Souza et al.'s (2014) findings corroborate those of Coimbra et al. (2021) revealing students who experience a greater enjoyment in physical activity develop an increased confidence in their academic abilities leading to greater self-efficacy.

Scope of Research

This review will explore qualitative, quantitative, and mixed-methods research studies where the use of classroom-based physical activity in secondary classrooms was investigated. Three themes will be discussed. The first theme will explore teacher beliefs about the use of movement and physical activity in the classroom. This information will provide the reader with insight into the current state of classroom-based physical activity and discuss the barriers educators face when attempting to implement it in their classrooms. The second and third themes will discuss the importance of physical activity for adolescents. The second theme will examine

the connection between physical activity and academic achievement, and the third theme will take a look at the benefits of physical activity for the social and emotional well-being of students.

Research Question

In light of what is known about differentiated instruction, what is considered best practice for secondary educators utilizing movement in their classrooms to meet the needs of their students and improve academic performance? When educators implement movement into their curriculum and daily lesson plans they are differentiating instruction. All students will benefit from the inclusion of physical activity, even if it does not directly relate to the content area. Benefits to student social, emotional, cognitive, and physical health, as well as academic improvement, can be observed.

Definition of Terms

Movement Breaks are any form of physical activity integrated into an educator's lesson or curriculum. Breaks can be connected to the content being studied, or they can consist of activities unrelated to the purposes of the coursework (Webster et al., 2013).

Classroom-Based Physical Activity is any form of physical movement implemented in the classroom setting intended to provide students with a short break and stimulate both physical and cognitive development (Calvert et al., 2019).

Physical Activity is any bodily movement that expends energy and improves the health of an individual (U.S. Department of Health and Human Services, 2018).

Summary

As students progress through their education, they are provided with fewer opportunities to remain active, yet research continues to suggest the importance of movement for students of all ages. Movement in the classroom setting not only supports students in their academic

endeavors, but more importantly, it supports their social, emotional, cognitive, and physical development. Secondary educators may not be able to take students back to the carefree days of their youth where they had the freedom to roam the playground during recess and expend endless amounts of energy during gym class; however, teachers can make a concerted effort to infuse their lessons and curriculum with movement breaks and activities providing students with the support they need to thrive socially, emotionally, cognitively, physically, and academically.

The review of qualitative and quantitative literature in Chapter Two will provide insight into teacher beliefs about movement in the secondary classroom, movement in relation to academic achievement, and the connection between physical activity and improved social and emotional health. Chapter Two will seek to respond to the research question and concisely summarize the vast amount of research conducted on the impact of physical activity and movement in the classroom. Chapter Three will discuss practical suggestions for educators looking to plan and implement curriculum that effectively merges academic rigor and movement.

Chapter Two: Literature Review

The continued removal of opportunities for movement and physical activity in secondary classrooms is detrimental to the development and academic success of students. Listening to lectures and watching videos for hours during the school day encourages sedentary behaviors and is disadvantageous for teachers attempting to combat the short attention spans of young people today. It is important for educators to intentionally plan lessons and create curriculum that provides time for students to remain physically active. Movement breaks are a great way to accomplish this as they keep students mobile, help retain their attention, and require very little time. Physical activity does not have to be vigorous, rather it can be something as simple as standing up to stretch.

The first section of this literature review examines teacher beliefs about movement in the secondary classroom. The three main barriers to teacher implementation of physical activity in the classroom are lack of administrative support, classroom management concerns, and lack of time. Calvert et al. (2019), Fedewa et al. (2018), Warehime et al. (2019), and Webster et al. (2013) found academic pressure and lack of direct administrative support prevent teachers at all levels from infusing their curriculum with movement breaks. McMullen et al. (2014) and Warehime et al. (2019) discovered classroom management and the fear of problem behaviors prevented educators from attempting to utilize movement breaks, and Domville et al. (2018) and McMullen et al. (2014) discussed lack of time in the school day as potential barriers to implementation.

The second section of this literature review looks at the relationship between physical activity and academic achievement. Fedewa et al. (2018), Hillman et al. (2005), Iri et al. (2017), Rodríguez de Souza et al. (2021), and Warehime et al. (2019) discovered a strong correlation between higher physical activity levels and academic achievement in adolescents. These researchers are all in agreement that physical activity in general, and the implementation of physical activity into the classroom environment can increase academic achievement.

The third section of the literature review investigates the association between physical activity and the social and emotional well-being of students. Brown et al. (2020), Coimbra et al. (2021), Khalsa et al. (2012), Kuiper et al. (2018), McMahon et al. (2017), Rodríguez de Souza et al. (2021), and Soytürk et al. (2019) discovered connections between students with higher physical activity levels and greater confidence, self-esteem, and emotional health. These findings have important implications for educators and school officials at the secondary level.

Beliefs about Movement in the Secondary Classroom

Educators have diverse perspectives on the importance, relevance, and implementation of movement in their classrooms. This section of the literature review will synthesize information from qualitative and quantitative studies and discuss in greater detail how a perceived lack of administrative support, classroom management concerns, and lack of time contribute to educators' inability to infuse lessons with physical activity. A discussion of the proposed benefits of the implementation of physical activity for student academic, social, and emotional success will follow.

Administrative Support

A recurring finding extracted from the review of literature was teacher beliefs about utilizing movement in the classroom. Calvert et al. (2019), Warehime et al. (2019), Webster et al. (2013), and Fedewa et al. (2018) all discovered a lack of administrative support prevented teachers from including movement breaks in their daily lessons. Calvert et al. (2019) conducted research on elementary teachers' use of movement in the classroom and gathered qualitative data on the implementation of classroom-based physical activity in two elementary schools. Teachers received professional development on the implementation of classroom-based physical activity before the study began, and they were asked to track usage of the strategy in a logbook over the course of 12 weeks. After ten weeks, interviews were conducted with teachers at both schools asking them questions about professional development and administrative support. The results of these interviews repeatedly displayed the teacher's desire for support from administration and school leaders surrounding their use of physical activity in the classroom (Calvert et al., 2019).

Unfortunately, the discomfort expressed by primary educators in this study was also found at the secondary level. Warehime et al. (2019) arrived at conclusions similar to those of Calvert through conducting qualitative research on the use of movement in secondary

classrooms. Interviews were conducted with 11 secondary science teachers and responses were analyzed. The results of this analysis displayed teachers' desire for administrative support of the use of physical activity.

The work completed by Calvert et al. (2019) and Warehime et al. (2019) was corroborated by Webster et al. (2013). They conducted quantitative research on classroom teachers' use of movement in the classroom by studying 201 primary and secondary teachers in South Carolina schools. Teachers were asked to complete a questionnaire inquiring about their feelings towards and use of classroom-based physical activity. The results indicated classroom teachers who recognized the school environment as supportive of classroom based physical activity were more likely to apply it in their lessons (Webster et al., 2013). The findings of these three researchers are conclusive and compelling, but the studies have some shortfalls.

Although the findings of the study conducted by Warehime are consistent with those discovered by Calvert and Webster, limitations were present. Limitations included a small, homogenous sample size of only 11 educators in Warehime et al.'s (2019) study, and unlike Calvert, no professional development was provided for teachers before the research began (Warehime et al., 2019). Both Calvert and Webster featured larger sample sizes, but Webster et al.'s (2013) findings only encompassed 12% of the schools they were seeking to research.

Calvert's study focused on elementary educators, Warehime's study focused on secondary educators, and Webster's study focused on both. Another study conducted by Fedewa et al. (2018) studied elementary school teachers and asked them to complete two movement breaks per day. One-hundred and seventy-six students engaged in academic-based movement breaks focused on connecting physical activity to classroom content, while 284 students engaged in aerobic-only movement breaks. The data collected was used by researchers to determine whether

aerobic-only movement breaks or academic-based movement breaks were more successful at supporting the students' academic success (Fedewa et al., 2018). In Warehime et al.'s (2019) research, secondary teachers reported implementing physical activity into their curriculum on an average of one to three times per week. The difference between the amount of physical activity implemented at the primary and secondary levels highlights the belief that movement is not as important for secondary students and supports the purpose of this review.

Lack of administrative support has been discussed as a barrier to the implementation of physical activity in the classroom at the primary and secondary levels. In a study conducted by Calvert et al. (2019), educators were interviewed and asked questions about their use of classroom-based physical activity. One educator stated:

> They [the principal] come in during my thirty second break when the kids are running up the walls... I'm like, 'I promise, I really am teaching.' Like I feel like I have to apologize, and I don't want to have to do that (p. 5).

Implementing classroom-based physical activity, or movement breaks of any kind, can be viewed as a risk, and many teachers choose not to implement these activities out of the fear they will be viewed in a negative light by their administration and risk their control of the classroom environment.

Classroom Management Concerns

Calvert et al. (2019), Fedewa et al. (2018), Warehime et al. (2019), and Webster et al. (2013) conducted research in the primary and secondary settings and they discovered educators desire more administrative support in their attempts to implement classroom-based physical activity. In their qualitative study exploring secondary educator's use of movement breaks,

Warehime et al. (2019) also found fears surrounding classroom management and problem behaviors prevented educators from utilizing physical activity.

McMullen et al. (2014) conducted qualitative research corroborating research conducted by Warehime. Data was collected from twelve elementary and high school educators in one indigenous school district regarding their intentional implementation of classroom-based physical activity. They found the teachers' largest concerns were in the area of maintaining control of the learning environment. After the data was analyzed, five words continually appeared in educator responses: "rowdy, chaos (or chaotic), silly, squirrely and rough" (McMullen et al., 2014, p. 516).

The findings of both Warehime and McMullen point towards educators' fears regarding classroom management when physical activity is utilized, however, both studies had limitations. McMullen et al. (2014) discussed the potential for greater teacher stressors in an indigenous school district where there are high rates of truancy, teacher turnover, and poor performance on standardized tests. This could skew interview data to reflect more classroom management concerns. Unlike McMullen, Warehime et al.'s (2019) study boasted a small sample size of only 11 secondary teachers. A small sample size can lead to data not representative of the opinions of most educators in regards to their use of physical activity in the classroom setting.

The above research discusses the classroom management concerns of teachers implementing physical activity into their lessons and curriculum. Teachers have also cited a lack of administrative support as a potential barrier to implementation. Another trend has emerged from the review of literature regarding teacher use of classroom-based physical activity: a lack of time.

Lack of Time

McMullen et al. (2014) cited classroom management concerns as a barrier to the implementation of classroom-based physical activity, but they also discovered educators' concerns about the lack of time to utilize physical activity in the classroom. One educator is quoted in the study saying, "Not enough time. There's never enough time" (McMullen et al., 2014, p. 520). Domville et al. (2018) also found lack of time to be a contributing factor in the implementation of physical activity. In their qualitative study, they conducted semi-structured interviews with nine primary school educators in an urban school with low socio-economic status. Educators reported a lack of time compounded by academic pressures to be a major reason for not implementing more classroom-based physical activity into their curriculum (Domville et al., 2018).

The findings of both McMullen and Domville point to lack of time as a barrier to teacher implementation of classroom-based physical activity. As previously discussed, limitations of McMullen et al.'s (2014) study included the student populations of the educators being interviewed and how it may have contributed to an increased number of negative responses regarding the implementation of movement breaks. Limitations to Domville's study are similar to those of McMullen. Domville et al.'s (2018) study centered on educators teaching in low socio-economic areas and they caution others from applying their findings to schools with differing demographics.

This section of the literature review discussed teacher beliefs and potential barriers to teacher implementation of classroom-based physical activity. Calvert et al. (2019), Fedewa et al. (2018), Warehime et al. (2019), and Webster et al. (2013) cited a lack of administrative support, while McMullen et al. (2014) and Warehime et al. (2019) specified classroom management concerns, and Domville et al. (2018) and McMullen et al. (2014) referred to lack of time as the

largest barriers. Although there are a multitude of barriers preventing secondary educators from normalizing the use of physical activity in their classrooms, there are many benefits to be discussed. In order to encourage secondary teachers to increase the amount of physical activity and movement in their classrooms, it is necessary to call attention to the strong correlation between movement and academic achievement.

Physical Activity and Academic Achievement

Educators identified a lack of administrative support (Calvert et al., 2019; Fedewa et al., 2018; Warehime et al., 2019; Webster et al., 2013), classroom management concerns (McMullen et al., 2014; Warehime et al., 2019), and lack of time (Domville et al., 2018; McMullen et al., 2014) as factors preventing them from implementing classroom-based physical activity. Neglecting to include physical activity and movement breaks into lessons not only impacts the physical development of students, but it also affects their academic achievement. To encourage more educators, specifically secondary educators, to implement physical activity into their lessons and curriculum, it will be helpful to review literature surrounding the second theme of this review: the relationship between physical activity and academic achievement.

Hillman et al. (2005), Iri et al. (2017), Fedewa et al. (2018), Rodríguez de Souza et al. (2021), and Warehime et al. (2019) discovered strong correlations between higher physical activity levels and academic achievement. A landmark study conducted by Hillman et al. (2005) found the cognitive functions of high-fit preadolescents and high-fit adults were further developed than those of low-fit preadolescents and low-fit adults. This study conducted quantitative research on 51 individuals and grouped them into four categories: low-fit children, high-fit children, low-fit adults, and high-fit adults. Results were similar for both children and adults and indicated faster processing speed, greater attention spans and improvements in

short-term memory for high-fit individuals (Hillman et al., 2005). This study did not specifically target secondary students, but it still holds importance for secondary educators.

Although Hillman et al.'s (2005) study investigated the physical fitness of preadolescent children and adults, there are still implications to be discussed for adolescent students. The adults who participated in this study were on average 19 years of age and high school students typically fall within an age range of 14 to 18 years old. This leads the writer to assert that these findings would also apply to students at the secondary level because of their close proximity in age to the study participants. Much like the findings discussed by Hillman et al. (2005), research has also been identified forging a connection between physical activity and academic achievement in students at the secondary level.

A quantitative study conducted by Iri et al. (2017) corroborated the findings of Hillman et al. (2005). Their study explored the relationship between the physical activity levels and academic achievement of secondary students and discovered the physical activity of adolescents does impact their academic achievement. Iri et al. (2017) randomly selected 1,207 students aged 14 to 17 to participate in their study. The physical fitness levels of students was determined by their completion of a questionnaire inquiring about their physical activity in the last seven days, and information was gathered on the students' academic performance by obtaining test scores from school administrators. Data was analyzed and correlations were discovered between physical activity and academic success; findings much like those of Hillman et al. (2005) who discovered correlations between physical activity and the cognitive functions leading to academic achievement (i.e. longer attention spans, greater short-term memory).

Although Iri et al. (2017) discovered a correlation between students with higher physical fitness levels and those with greater academic success, this was not found to be the main factor in

determining students' academic achievement. One limitation discussed was the researchers' failure to collect data about the students' socio-economic levels (Iri et al., 2017). Iri et al. (2017) stated literature surrounding the topic of physical activity and academic achievement revealed students in higher socio-economic brackets typically possess higher levels of fitness because they are usually more involved in organized sports.

Thus far, the relationship between movement, cognitive growth, and academic success has been identified (Hillman et al., 2005; Iri et al., 2017). If physical activity and movement do in fact lead to better academic performance, then what is considered best practice for secondary educators? To help answer this question, Fedewa et al. (2018) explored the effectiveness of different types of movement breaks in the achievement of elementary school students. Four-hundred and sixty elementary students were recruited and placed into two groups: academic-based movement breaks or aerobic-only movement breaks. Teachers at these schools were assigned at random to complete one of the above types of movement breaks. Students' physical activity levels during these breaks were monitored utilizing pedometers, and their academic achievement was evaluated using the FastBridge Learning standardized assessment (Fedewa et al., 2018). After analyzing data comparing the academic performance of students who completed academic-only movement breaks and aerobic-only movement breaks, it was determined aerobic-only movement breaks led to better math and reading scores.

Much like Iri et al. (2017), Fedewa discovered increased academic achievement; however, Fedewa's (2018) results zeroed in on specific subject areas. This carefully crafted study produced great results carrying implications for teachers at the primary and secondary levels, but there were limitations. Limitations included a failure to account for teacher experience and motivations for implementing movement breaks in their classrooms. Both variables could have a

large impact on the results and could be used to explain variations found in the data (Fedewa et al., 2018).

Fedewa et al.'s (2018) findings support the conclusions of both Hillman et al. (2005) and Iri et al. (2017). Hillman et al. (2005) discussed the connection between physical activity and cognitive development, and even though the relationship to academic achievement was not observed, greater cognitive skills were, and these skills are typically associated with greater academic achievement. Unlike Hillman et al. (2005), Iri et al. (2017) explicitly studied the relationship between movement and academic performance and discovered significant statistical results supporting the relationship between the physical activity levels and academic performance of adolescents.

Fedewa et al. (2018), Hillman et al. (2005), and Iri et al. (2017) discovered connections between physical activity inside and outside of the classroom and the academic performance of students. Rodríguez de Souza's work corroborated these findings. Rodríguez de Souza et al. (2021) conducted quantitative research by surveying 442 adolescent students about their intrinsic motivation and enjoyment of physical activity. Results revealed a positive correlation between student enjoyment of physical activity and confidence in academic abilities (Rodríguez de Souza et al., 2021). Warehime et al.'s (2019) study has already been discussed in this review to help understand barriers to teacher implementation of physical activity in the classroom, but their findings can also connect to academic achievement. Like Fedewa et al. (2018), Hillman et al. (2005), and Iri et al. (2017), Warehime et al. (2017) also found connections between physical activity and academic achievement, stating teachers reported improvements in their students' academic performance.

Conclusion

Hillman et al. (2005), Iri et al. (2017), Fedewa et al. (2018), Rodríguez de Souza et al. (2021), and Warehime et al. (2019) researched the impact physical activity has on students' academic performance. Their findings discussed a strong correlation between higher physical activity levels, both inside and outside the classroom, and better educational outcomes. Although performance in the classroom is important, it is of the utmost importance for educators to support their students' social and emotional health. The third theme of this review will discuss physical activity and its connection to the social and emotional well-being of secondary students.

Physical Activity and Social/Emotional Well-Being

The first theme of this review identified a lack of administrative support (Calvert et al., 2019; Fedewa et al., 2018; Warehime et al., 2019; Webster et al., 2013), classroom management concerns (McMullen et al., 2014; Warehime et al., 2019), and lack of time (Domville et al., 2018; McMullen et al., 2014) as factors preventing educators from implementing classroom-based physical activity into their curriculum. After the barriers to implementation were addressed, the second theme discussed the importance of classroom-based physical activity for student academic achievement (Fedewa et al., 2018; Hillman et al., 2005; Iri et al., 2017; Rodríguez de Souza et al., 2021; Warehime et al., 2019). The implementation of physical activity in the classroom not only impacts students' academic performance, but it also positively influences their social and emotional well-being. Soytürk et al. (2019), Kuiper et al. (2018), Rodríguez de Souza (2021), McMahon et al. (2017), Khalsa et al. (2012), Brown et al. (2020), and Coimbra et al. (2021) conducted research establishing this connection and the third theme of this review will unpack their findings.

A quantitative study conducted by Soytürk et al. (2019) surveyed 374 ninth grade students about their physical activity, self-esteem, and decisiveness. Researchers utilized

correlational analysis and found an increase in physical activity improved the self-esteem of participants and decreased indecision. Kuiper et al. (2017) discovered similar patterns to those of Soytürk et al. (2019) in their quantitative study of 96,617 adolescents. Survey participants were asked to complete the Dutch National Youth Health Monitor and an analysis of the data indicated physically active students experienced fewer psychological and social problems. Kuiper et al.'s (2017) findings also connect to the second theme of this review when they stated, "Psychosocial problems negatively affect school performance, social skills and mental development" (Kuiper, et al., 2017, p. 468).

Supporting students' social and emotional health directly impacts their academic performance and after reviewing the literature discussed above it is clear that consistently infusing physical activity into the classroom environment not only supports students academically, but also cognitively, socially, and emotionally. Rodríguez de Souza et al.'s (2021) work was also discussed in the second theme of this review and their findings corroborate those of Soytürk et al. (2019) and Kuiper et al. (2017). Rodríguez de Souza et al. (2021) stated students who exhibited higher levels of enjoyment of physical activity exhibited greater self-confidence and sense of self-worth.

Kuiper et al. (2017) and Soytürk et al.'s (2019) findings carry important implications for secondary educators, but there were limitations. Researchers stated they wished they had included more specific questions about the intensity and type of exercise students completed (Kuiper et al., 2017). Both Kuiper et al. (2017) and Soytürk et al.'s (2019) studies also did not specifically address adolescent physical activity in the classroom environment; rather, they sought to understand the relationship between physical activity conducted outside the classroom and student social and emotional well-being.

McMahon et al. (2017) also discovered a correlation between higher levels of physical activity and lower levels of anxiety. In their quantitative study, they surveyed 11,110 adolescents on their physical activity, sport participation, depression, anxiety, and overall well-being. Distinctions were made between survey participants and they were placed in three groups: least active, somewhat active, and most active. The largest difference in overall well-being was found between the least active and somewhat active students (McMahon et al., 2017). To better support students in the least active category, it is in the best interest of educators to implement classroom-based physical activity with varying levels of intensity.

Physical activity is defined as any form of moderate to vigorous exercise raising an individual's heart rate (U.S. Department of Health and Human Services, 2018). Yoga is a form of physical activity that can vary in difficulty and place a focus not only on physical exercise, but also on mental well-being. Khalsa et al. (2012) conducted a quantitative study exploring the connections between yoga and mental health benefits in secondary students. They administered yoga instruction to 11th and 12th grade students and surveyed them regarding mood, resiliency, and perceived stress before, during, and after the classes. Khalsa et al. (2012) discovered the implementation of yoga classes had a preventative effect on the mental health of participants and it led to calmer students who exhibited a higher capacity to cope with stress.

Similar to the studies conducted by Calvert et al. (2019) and Fedewa et al. (2018) discussed in the first and second themes of this review, Brown et al. (2020) conducted a mixed-method study and interviewed 511 elementary and secondary educators regarding their implementation of classroom-based physical activity. Educators reported they were aware of the positive effects of physical activity for students' social and emotional health, but they were also aware of the negative impacts. They understood bullying and rejection can influence students to

avoid physical activity. In both Soytürk et al. (2019) and Kuiper et al.'s (2017) studies a percentage of student survey results indicated a disdain for physical activity. Negative experiences with physical activity early in a students' education can drastically influence their perceptions of exercise and movement. Educators should be aware of the negative influence peers can have and seek to foster a positive and safe learning environment for all.

Coimbra et al. 's (2021) research in the implementation of behavioral skill training in physical education found connections similar to those of Brown et al. (2020), Kuiper et al. (2017), McMahon et al. (2017), and Soytürk et al. (2019). Behavioral skill training was implemented into secondary schools for a seven-week period and students reflected on their experiences. Behavioral skill training typically seeks to improve motor skills, but this study attempted to research its connection to physical activity. After an analysis of the data was completed it was discovered that behavioral skill training led to more sport participation amongst adolescents and could help foster physically active lifestyles (Coimbra et al., 2021). This is relevant to the review because students with greater levels of physical activity were proven to perform better academically and have better social and emotional health.

Review of Proposed Problem

When children begin their journey through education they are provided with ample opportunities for physical activity and movement inside and outside of the classroom. However, as they transition from childhood to adolescence something changes, and research suggests student's lifestyles have become increasingly sedentary (Dumith et al., 2011, as cited in Coimbra et al., 2021). In order to combat the sedentary lifestyles of young people today educators need to intentionally implement classroom-based physical activity into their lessons and curriculum.

Review of Importance of Topic

Opportunities for students to remain physically active in the school environment are continually decreasing. They sit in lecture after lecture throughout the course of the school day and the monotony is only relieved by a brief five minute walk between class periods. The extent of their physical activity is confined to 1 or 2 physical education courses that many school districts no longer require. This encourages sedentary behavior and negatively impacts students' well-being. Secondary educators can reinvigorate their classrooms and curriculum through the implementation of movement breaks and better support their student's physical, cognitive, social, and emotional health.

Physical activity can seamlessly be implemented into the general education classroom at the secondary level and it is absolutely essential for educators to understand its importance. Infusing lessons and curriculum with classroom-based physical activity not only has a positive impact on students' physical health, but it also supports their academic achievement (Fedewa et al., 2018; Hillman et al., 2005; Iri et al., 2017; Rodríguez de Souza et al., 2021; Warehime et al., 2019) and social and emotional development (Brown et al., 2020; Coimbra et al., 2021; Khalsa et al., 2012; Kuiper et al., 2018; McMahon et al., 2017; Rodríguez de Souza et al., 2021; Soytürk et al., 2019). If educators truly wish to support the entirety of their students' development, then they will seek to implement movement and physical activity into their courses.

Summary of Findings

The first theme of this review discussed the barriers to teacher implementation of classroom-based physical activity. Lack of administrative support, classroom management concerns, and lack of time were found to prevent the use of physical activity in the classroom. If educators are able to navigate these roadblocks, then their students will glean important benefits.

The second and third themes of this review focused on the potential benefits of implementing classroom-based physical activity. A strong correlation between higher physical activity levels and academic achievement in students of all ages was discovered. Academic achievement is important, but the connection between academic achievement and social and emotional health cannot be ignored. Findings also indicate the social and emotional health of students tends to be better when higher levels of physical activity are present.

Conclusion

Research suggests the implementation of physical activity inside and outside of the classroom supports the academic achievement and social and emotional well-being of students. Research also suggests educators seeking to implement movement into their curriculum lack the support and training necessary to effectively apply these findings. The remainder of this review will be dedicated to discussing practical applications for educators seeking to infuse their lessons and curriculum with meaningful classroom-based physical activities and answer the proposed research question: In light of what is known about differentiated instruction, what is considered best practice for secondary educators utilizing movement in their classrooms to meet the needs of their students and improve academic performance?

Chapter 3: Implications for Practice

Insights Gained from Research

Movement breaks and physical activity are commonplace amongst elementary school teachers, but when young people enter their middle and high school years they find themselves sitting in desks for entire class periods at a time with no opportunities to stand up, stretch, or move around. Secondary educators have expressed a desire to utilize classroom-based physical activities, but struggle to find tangible ways to implement them into their classrooms (Calvert et

al., 2019; Domville et al., 2018; Fedewa et al., 2018; McMullen et al., 2014; Warehime et al., 2019; Webster et al., 2013). Chapter Three will explain insights gained from the review of literature, provide educators with practical applications, and discuss future areas of study.

Insights gained from the review of literature above include the strong connection between physical activity and social and emotional well-being, the importance of physical activity to support students' academic growth, and the importance of adequate professional development. Soytürk et al. (2019), Kuiper et al. (2018), Rodríguez de Souza et al. (2021), McMahon et al. (2017), Khalsa et al. (2012), Brown et al. (2020), and Coimbra et al. (2021) all conducted research discovering connections between higher levels of physical activity and greater social and emotional well-being. Kuiper et al. (2018) and Soytürk et al. (2019) found greater physical activity levels increased the self-esteem of their participants, while McMahon et al. (2017) discovered lower levels of anxiety in students who remained physically active. Rodríguez de Souza et al. (2021) even connected the importance of supporting students' social and emotional health to their academic achievement, stating students who exhibited greater enjoyment of physical activity had more confidence in their overall abilities.

Social and emotional health is tied closely to academic achievement and the second insight gained from the review of literature will discuss the importance of physical activity to support students' academic growth. Hillman et al. (2005), Iri et al. (2017), Fedewa et al. (2018), Rodríguez de Souza et al. (2021), and Warehime et al. (2019) discovered strong correlations between higher physical activity levels and academic achievement. After surveying a large group of secondary students, Iri et al. (2017) discovered a connection between the physical activity and academic performance of adolescents, while Fedewa et al. (2018) studied specific types of movement and their effect on student achievement.

Movement has been proven to support the healthy development of students physically, academically, socially, and emotionally, but educators feel as though they are not prepared to implement classroom-based physical activity. The third insight gained from this review is the importance of adequate professional development surrounding the use of physical activity in the secondary classroom. Educators continually expressed their desire to implement these activities, but felt a lack of administrative support, classroom management concerns, and time restraints prevented them from doing so. Warehime et al.'s (2019) research corroborates this claim stating educators see the importance of implementing classroom-based physical activity and desire more professional development on how to effectively utilize it in their classrooms. Providing educators with the support they need to implement physical activity in their classroom will allow them to better meet the needs of their students. The next section of this review will discuss practical applications for educators attempting to implement classroom-based physical activity.

Applications

Important insights were discussed regarding the implementation of classroom-based physical activity including the strong connection between physical activity and social and emotional well-being, the importance of physical activity to support students' academic growth, and the importance of adequate professional development. Practical applications for educators seeking to implement classroom-based physical activity into their curriculum will be discussed. Applications to be discussed include: aerobic-only movement breaks, academic-based movement breaks, and the importance of fostering meaningful relationships.

Implementing physical activity into the secondary classroom can take many forms. One option for educators is aerobic-only movement breaks. Aerobic-only movement breaks require very little time and consist of teacher led physical activity. Aerobic-only movement breaks are

more effective at improving the academic performance of students and can include both structured and unstructured activities (Fedewa et al., 2018). Structured activities include games or the completion of small classroom tasks, while unstructured activities include time for students to stand up and stretch, talk with their peers, or simply go outside for a breath of fresh air. Regardless of what activities or movement breaks educators decide to implement, the importance of physical activity for secondary students cannot be overstated. If secondary educators desire to support the physical, cognitive, social, emotional, and academic growth of their students, then physical activity needs to be implemented into their curriculum.

Another option for educators seeking to implement physical activity into their classrooms is academic-based movement breaks. Academic-based movement breaks seek to connect classroom content to some form of movement. Examples of academic-based movement breaks include gallery walks, question trails, or classroom walkabouts. Educators can post questions around the room for students and ask them to walk around and answer them, or educators can be more creative and implement activities such as a scavenger hunt. A scavenger hunt activity requires students to explore the classroom and find vocabulary terms or questions the teacher has hidden. Although both aerobic-based movement breaks and academic-based movement breaks boasted positive results for student achievement, a study conducted by Fedewa et al. (2018) found aerobic-based movement breaks produced better academic results for students.

Perhaps the most important application for educators is the importance of fostering meaningful relationships with their students. Although this application was not discussed in the review of literature above, it can be connected to the barriers brought forth by educators regarding their inability to implement classroom-based physical activity. Most, if not all, of the concerns discussed by educators regarding their implementation of classroom-based physical

activity can be addressed when meaningful student-teacher relationships are established. Classroom management becomes easier because students feel valued and transitions between activities unfold more smoothly. The lack of time previously discussed as a barrier is no longer applicable because educators are better equipped to seamlessly transition their classes from one activity to the next.

Future Studies

The research conducted on the importance of physical activity for the healthy development of adolescence is vast, but research is lacking in the following areas: the implementation of classroom-based physical activity at the secondary level, classroom-based physical activity and its effect on classroom management, and the effectiveness of professional development surrounding classroom-based physical activity. The academic, social, and emotional benefits to physical activity outside the classroom loom large, but more research is needed to discover how secondary educators in the general classroom setting can leverage those benefits to better support students in their classrooms.

More research in the area of classroom management and student behavior regarding the implementation of physical activity is necessary. Effective classroom management is pivotal for educators attempting to create a safe learning environment conducive to student development. More research is needed to uncover the effect physical activity has on student behavior and subsequently academic, social, and emotional success.

In the review of literature above, educators continually voiced their desire for professional development regarding the implementation of classroom-based physical activity. Only one of the studies included a sample size of teachers who were provided with professional development, while all others neglected this important strategy. It would be interesting to

examine educators' perceptions of classroom-based physical activity before and after the professional development as well as the academic, social, emotional, and behavioral impacts it has on their students.

Conclusion

Throughout the review of literature discussed above one message rings clear: physical activity is an essential aspect for the healthy development of adolescents. Physical activity not only supports adolescent physical development, but also their cognitive, academic, social, and emotional growth. Secondary students are continually encountering fewer and fewer opportunities for movement throughout their school day and this can be combated by educators seeking to implement movement into their classroom routines and curriculum.

Barriers to the implementation of classroom-based physical activity are present, primarily at the secondary level, and educators identified a lack of administrative support, classroom management concerns, and time constraints as the largest preventative factors. Solutions to the aforementioned problems are complex, but not impossible. Solutions to these concerns include increased professional development for both teachers and administrators, the implementation of aerobic-based and academic-based movement breaks, and a focus on relationship building in the classroom.

The care-free days of students' youth do not have to be replaced with sedentary activities as they age. Listening to lecture after lecture and remaining seated for hours at a time does not have to be the norm. This is not to say a student's educational experience should stay the exact same as they grow and develop from a child to an adolescent; instead of chasing peers around the schoolyard, traversing the jungle gym, sliding down the slide, or swinging through the cool, fresh air, students should be able to take walks with their classmates, engage in activities outside the

confines of their desk, and be challenged both mentally and physically through the effective implementation of classroom-based physical activity.

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Appendix

Article Tracking Matrix

Articles: Author(s) name and year of publication	**Method:** Qualitative/ Quantitative/ Meta-Analysis Mixed-Methods	**Theme 1:** Beliefs about Movement in the Secondary Classroom	**Theme 2:** Physical Activity and Academic Achievement	**Theme 3:** Physical Activity and Social/Emotional Well-Being
Brown, Monica; Burriss, Kathleen G.; Snead, Donald; Burriss, Larry L. (2020)	Mixed-Method			X
Calvert, Wennerb, Turners (2019)	Qualitative	X		
Coimbra, Cody, Kreppke and Gerber (2021)	Quantitative			X
Domville; Watson, Richardson, Graves, (2019)	Qualitative	X		
Fedewa, Fettrow, Erwin, Ahn, Farook (2018)	Quantitative	X	X	
Hillman, Castelli, Buck (2005)	Quantitative		X	
Iri, Ibis, Aktug (2017)	Quantitative		X	X
Khalsa, S. B., S., P., Hickey-schultz, L., Cohen, D., M.Ed, Steiner, N., M.D., & Cope, S., M.S.W. (2012)	Quantitative			X

Kuiper, J., Broer, J., & van der Wouden, J. C. (2018)	Quantitative			X
McMahon, E. M., Corcoran, P., O'regan, G., Keeley, H., Cannon, M., Carli, V., Wasserman, D. (2017)	Quantitative			X
McMullen, J., Kulinna, P., & Cothran, D. (2014)	Qualitative	X		
Rodríguez de Souza, Andrea Alessandra, Pajuelo, Alexandra Fabiola Tarazona, Luján, Mario Reyes, Bossio (2014)	Quantitative		X	X
Soytürk, M., & Öztürk, Ö. T. (2019)	Quantitative			X
Warehime, Snyder, Schaffer, Bice, Adkins-Bollwit, & Dinkel (2019)	Qualitative	X	X	
Webster, C. A., Caputi, P., Perreault, M., Doan, R., Doutis, P., Weaver, R. G., (2013)	Quantitative	X	X	