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Teachers' Perspectives on the Impact of Physical Activity on Classroom Behavior

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Abstract

Research shows that there are numerous benefits to allowing students to be physically active throughout the school day, such as increasing motivation, decreasing behavioral issues, and improving on-task behavior (Centers for Disease Control and Prevention, 2018) The purpose of this research was to assess, from the perspective of teachers and teacher aids, the relationship between physical activity and elementary school aged students' academic and behavioral performance in the classroom. Previous research conducted supports that the inclusion of physical activity during the school day helps improve students academic and behavioral performance in the classroom. Teachers and teacher aids were chosen as participants because they observe and interact with students on a daily basis. The survey asked participants to indicate if they include physical activity during class-time, the duration and types of such activities, and what benefits they believe come from these activities. The overall findings of this study show most participants include exercise breaks for their students and favor the idea that class-time physical activity is beneficial for students.

Introduction

According to the 2008 second edition Physical Activity Guidelines for Americans, the health recommendation for children and adolescents, ages six to seventeen, is to obtain a minimum of sixty minutes of moderate to vigorous physical activity per day. Statistics published by the Centers for Disease Control and Prevention (CDC) indicate astonishingly low numbers of children actually meeting these guidelines; only twenty-four percent of children ages six to seventeen meet the recommendation of sixty minutes of physical activity per day (Center for Disease Control and Prevention, 2018) .

School districts across the nation have different policies and practices regarding classroom physical activity. Classroom physical activity is defined as planned physical activity that takes place during the school day and often occurs in multiple brief periods (Center for Disease Control and Prevention, 2018). According to the CDC, only forty-three percent of elementary schools participate in regular planned physical activity breaks, not including physical education class, throughout the school day. Additionally, only eleven percent of elementary schools require that students are given planned classroom physical activity breaks during every school day (Center for Disease Control and Prevention, 2018) .

Children spend an extensive amount of time in their early years at school, which makes schools a highly influential position in children's lives. The school environment could be an ideal setting for educating students about what a healthy and active lifestyle looks like. Schools have the potential to go beyond the realm of strictly teaching children academic subjects but could also help to promote and instill lifelong healthy behaviors. A study performed out of Brown University, that surveyed approximately 50,000 American families, suggests that routines and habits are well established in children by age nine (Pressman, Owens, Evans, & Nemon, 2014).

This finding stresses the importance of helping children form healthy habits from early development. Children spend a significant amount of their time in school during this critical development period, making schools a great environment to instill the importance of, and strategies to maintain an active healthy lifestyle.

The purpose of the current research project was to further the understanding of how physical activity throughout a student's school day could positively influence their overall behavioral and academic performance. A review of previous research describes how exercise affects the physical and cognitive performance as well as classroom behavior. The literature review will also provide data on barriers and attitudes of the incorporation of physical activity during the school day from the perspective of teachers and principals. The current study was conducted to provide insights from those who experience working with children in a classroom setting in Northeast Ohio. Teachers and teacher aids were asked questions regarding their opinions about prioritizing opportunities for physical activity and barriers to physical activity throughout the school day.

Literature Review

The Physiological Process Happening in the Brain During Exercise

To better understand the importance of physical activity, it is important to understand what happens to the brain while a person participates in exercise. During physical movement heart rate increases which leads to a greater flow of blood to the brain. This greater flow of blood provides a greater amount of oxygen, protein, and nutrients to the brain that promotes health and the formation of new brain cells. Overall this process supports brain health and function. Mood enhancement is another process that takes place in the brain during a bout of physical activity. The release of feel-good chemicals such as endorphins and dopamine are the driving reason

behind improvements in mood and the reduction of stress that often takes place during exercise (Weaver & Doyle, 2019). Norepinephrine is released in addition and plays a key role in triggering the signals that affect attention, perception, and motivation (Australian Institute of Fitness, 2020).

Bodily movement also allows for the production and transfer of proteins through the bloodstream into the brain which contributes to the growth of brain cells. In addition to these processes, exercise can also lead to an increase in brain-derived neurotrophic factor (BDNF). This type of neurotrophin allows for the synapses in the brain to take in, process, associate, remember, and put new information into context. BDNF is also responsible for causing neurons to connect and grow which plays an important role in neuroplasticity and neurogenesis (Australian Institute of Fitness, 2020). Neuroplasticity is the brain's ability to adapt to new situations and environments. This adaptation process contributes to how a human is able to master new skills and store new information (EMOTIV, 2021). The process is especially crucial after the brain has been injured or while the brain is learning new information. So a strong ability to carry out this process can be a great contributing factor to learning.

The Impact of Physical Activity on Cognitive Performance

Research has shown that regular participation in physical activity supports cognitive functioning (Bidzan-Bluma & Lipowska, 2018). A study published by the International Journal of Environment Research and Public Health provided insight into this topic through a systematic review of research studies looking at physical activity and its impact on cognitive function. Results suggested that regular physical activity in students was found to have a positive effect on attention to a given task, improved executive functions such as the planning ability, creative thinking, language development, and learning and memory (Bidzan-Bluma & Lipowska, 2018).

The Impact of Physical Activity in the Classroom on Behavior

A major aspect of behavior of a student is focus and on-task behavior during class time. A potential barrier to including physical activities throughout the school day is the lack of time available due to a full curriculum. Conversely, the point should be raised that a student engaging in off-task behavior can use up valuable education time for not only themselves but for their teacher and student peers as well. Research has been conducted to explore the idea that allowing students to participate in breaks to physically move around may be associated with decreasing the amount of off-task behavior (Goh, 2017). For instance, a study was performed using a physical activity program designed for in-class participation from the International Life Sciences Institute, called TAKE 10!. This program used a multitude of ten minute activities that coincide with an academic subject. The sample used in this research was students (n=37) from an elementary school in the United States. In-school physical activity measurements were taken through the use of pedometers, which measured step count. These were only used during the school day. Direct observations were used to measure student's on-task classroom behavior. If observers noticed students obeying class rules, paying attention to teachers, and engaging in learning activities they were coded as showing on-task behavior. Students were coded as having off-task behavior if they were yawning, gazing off, laying their head on their desk, working on unassigned activities, talking to other students when not a part of an assignment, or leaving their desk without permission granted by the teacher. Teachers were instructed to allow students to participate in the TAKE 10! program at least one time per school day. Results from this study noted that there was an increase in the students' average steps per day by the end of the intervention. By mid-data collection there was an increase of about 421 daily steps per student and by the final data collection there was an increase of about 853 daily steps per student

throughout the school day. The ratings for students' classroom behavior were given a numerical score. Overall, students' on-task behavior improved by 5.5% from the baseline data to the final data collection. This research describes and addresses lack of time as being a barrier for physical activity breaks throughout the class day. Providing students with the opportunity to participate in small breaks of movement throughout the day can lead to improvements in students' on-task behavior, reducing the time wasted by incidences of off-task behavior (Goh, 2017).

The BioMed Research International journal published a study that provides additional evidence of the association between student's participation in physical activity and attention levels. Participants in this study were given a test before and after physical activity interventions that assessed their attention and concentration. The subjects of this study were from two different elementary schools- one intervention group and one control group. Students in the intervention group participated in six-minute physical activity videos once a day after they had been sedentary in class for at least twenty minutes. The control group continued with their normal school routines. Results from this research found that the students who were in the intervention group had significantly better scores on the posttest than those who were in the control group. The posttest demonstrated that students who engaged in the physical activity breaks showed improvements in processing speed, focused attention, concentration, and attention span (Harris, Corinta, Templin, Colabianchi, & Chen, 2018).

Teachers' and Principals' Perspectives on Physical Activity Programs and Barriers

A shockingly low 42% of children ages six to eleven and 8% of adolescents meet the recommended goal of sixty minutes of physical activity per day (Goh, 2017). These statistics indicate that change needs to be undertaken to help children reach recommended daily movement goals. Schools are a great starting point to develop healthy exercise habits among

youth because they hold such a heavy influence on children. There are many barriers that are faced while trying to implement such strategies (Goh, 2017). Research has been performed to discover potential obstacles that prevent students from meeting their daily movement needs during the school day. The International Journal of Environmental Research and Public Health published a study called "It's a Battle… You Want to Do It, but How Will You Get It Done?": Teachers' and Principals' Perceptions of Implementing Additional Physical Activity in School for Academic Performance." Participants included teachers and principals (n=26) working in primary education schools. The motives behind this study were to discover teachers' and principals' attitudes towards the implementation of physical activity programs to improve academic performance and find out their opinions on the most effective ways to achieve student participation in these programs. Interviews were used to gather the data and the responses were analyzed. The study found that the teachers and principals who participated all displayed positive attitudes towards the inclusion of physical activity throughout the school day. The most prominent factors they noticed were academic benefits, physical health benefits, and social and emotional benefits. A common opinion found among teachers was that allowing students small breaks to release their energy was helpful in regaining attention. Most teachers also agreed that having a healthy body leads to better cognitive performance. An increase in social skills and self-confidence among students was another general opinion that most teachers held towards allowing for physical activity throughout the school day. They noted that the development of these skills are especially noticeable when students participate in group activities or games that require collaboration with other students. Most participants expressed that they would like to include physical activity throughout the school day but that there are several barriers that prevent them from doing so. One of the most emphasized barriers was the lack of time and priority for

student physical activity. With a highly demanding curriculum and school schedules already full teachers find it is incredibly difficult to find ways to include time for bouts of exercise on a school day. Another constraint was the issue of not enough space for all the students to participate in physical activity breaks in the classroom. With large classes sizes in limited areas the task of increasing physical activity is less achievable. The study concluded with discussion on how increasing the amount of physical activity students could become more feasible. One of the suggestions made was that teachers need to implement physical activity themselves in their own classrooms. However, taking their class to another location for exercise makes the process more time consuming and ineffective. Teachers did agree on the idea that short five-to-ten-minute bouts of physical activity throughout the school day was an effective way to reach students' physical activity goals. The overall theme of this study was that the teachers and principals who participated saw great value in incorporating physical activity throughout the school day but also felt that there are many barriers to achieving this goal. Additional research is needed to determine ways to make the inclusion of class time physical activity a realistic goal (Berg, Salimi, Groot, Jolles, Chinapaw, & Singh, 2017). The current study addressed this need by recognizing the importance that teachers see in providing their students with physical activity throughout the school day. Data also provided suggestions on different types of activities that teachers could use to provide students with the opportunity to be physically active.

Method

Design, Setting, and Participants

The study was approved by The University of Akron Institutional Review Board (Appendix A). An authorization letter and participant waiver was then signed and collected from the principal of Royalview Elementary School to administer permission to send surveys to

faculty members (Appendix B). Once permission was received an informed consent was given to each potential participant for them to sign and provide their email (Appendix C). To participate in the study, participants had to be a current teacher or teaching aid at Royalview Elementary School in North Royalton, Ohio. The survey was sent to twenty four participants of which nineteen responded. The survey asked participants to identify the grade level with which they worked with and allowed them to select more than one. Of the total responses, 7 selected kindergarten, 7 selected 1st grade, 8 selected 2nd grade, 6 selected 3rd grade, and 4 selected fourth grade. Participants were given the option to select "other" and provide their answer. This section included two who work with multiple disabilities unit K-4, one that works with preschool, and one that is an intervention specialist.

Sampling and Data Collection Procedures

The signature form was sent out to participants to sign if they agree to fill out the survey and to confirm that they meet the participation criteria. After the collection of these forms the electronic survey was sent out on February 12, 2021 and participants were allowed one week to complete the survey. Google forms (Google LLC, Mountain View, CA) is an online survey program that allows for surveys to be sent via email and keeps respondents anonymous. Our survey consisted of ten multiple choice and short answer questions (Appendix D).

Results

The findings of this study are solely based upon the opinions and estimations of participants. For the purpose of this study, physical activity was defined as any type of voluntary bodily movement (Center for Disease Control and Prevention, 2018). The survey provided this definition to the teachers and asked them if they provide any physical activity interventions for students through the school day. Participants were instructed to answer yes if they allow for

students to have at least one break during class time every day to get up and move or engage in a physical activity for at least five minutes. The majority (88.9%) answered yes, while 11.1% answered no. An open-ended question had participants estimate the duration of each activity that students participated in, with results ranging from two to five minutes all the way up to twenty to thirty minutes. Some answers indicated that they include these activity breaks multiple times throughout the day, depending on the activity and the coursework that is needed to be completed that day. Below are the results:

Table 1
Participants Estimated Duration of Class-time Physical Activity

Estimated Time (In Minutes)	Number of votes (n=19)
0 Minutes	3
2-5 Minutes	4
5-10 Minutes	6
10-15 Minutes	2
20-30 Minutes	1
Varies by day	3

The data suggests that there is a possible correlation between the grade level taught and the duration of the classroom physical activity performed. The participants that teach second grade and below all selected that they keep the duration of the activity under ten minutes, while those who teach older grade levels or work in a classroom with multiple disability students provide activities of longer durations.

Additionally, participants asked, "Excluding physical education classes, how much would you estimate that students are physically active during each school day?" 33.3% said ten to

twenty minutes, 27.8% said twenty to thirty minutes, 22.2% said thirty to sixty minutes, and 16.7% said more than sixty minutes. Below are the results:

Table 2
Participants' Estimation on How Much Time Students are Physically Active Per Day

Estimated Time (In Minutes)	Number of votes
10-20 Minutes	6
20-30 Minutes	5
30-60 Minutes	4
>60 Minutes	3
No response	1

These data were further broken down by grade level. Of the teachers who selected multiple grade levels, one participant estimated ten to twenty minutes, two participants estimated twenty to thirty minutes, two participants estimated thirty to sixty minutes, and one participant estimated over sixty minutes. The two participants who work with strictly first grade students approximated twenty to thirty minutes and thirty to sixty minutes. The participant who works solely with third grade estimated twenty to thirty minutes. All of the three participants who teach kindergarten only, chose ten to twenty minutes. Two of the participants who work in the multiple disabilities' unit, both estimated that their students receive more than sixty minutes of physical activity per day.

The next research question asked teachers how many years they have included physical activity breaks for students in their classroom. Four participants said they have done this for as long as they have been a teacher or can remember. "Many years. Little kids need time to move!" was a statement included in one of the answers. Others indicated anywhere from two to fifteen

years. One participant said they always have but have become more intentional about it within the past five years. The data can be further broken down based upon each grade level participants chose. Of those who selected multiple grade levels, one selected that they have incorporated physical activity for their entire career, one answered fifteen years, and two selected that they began within the past year. All three of the participants who selected that they teach first grade, claimed that they have always incorporated physical activity into class time. Of the participants who stated that they work with second grade, one said they have always provided class time physical activities and one said they have for thirty-four years. The participant who works with third grade students only, stated that they have always included physical activity in the classroom. Two of the kindergarten teachers chose twenty-two years and one stated that they have included physical activity in the classroom for their whole career. The two participants who work in the multiple disabilities unit both selected that they have included physical activity in their classroom for the past two years.

Participants also described in their own words the physical activities in which they have their students participate. Only those who included these physical activity breaks answered. Below are the results:

Table 3
Types of Physical Activity Participants Include During Class Time

Dancing, yoga, exercises, action phonics, extra recess
Jack Hartman videos, movement songs on YouTube, Cosmic Kids Yoga, Go Noodle
Teacher-led exercises, yoga stretches, walk around the building

Learning movement songs on YouTube, Go Noodle songs, and dance music. All of these are adult modeled or assisted. Students ride tricycles, use scooter boards, jump on trampolines, and take walks.

Physical education which is teacher led, stretching and running in place which is teacher led, Go Noodle, and interactive videos

Movement break songs

Taking a walk, bouncing on a ball, yoga videos

Dancing, stretching, jumping, walking around, etc.

Exercise, yoga or dance videos; or just moving from their seat to the carpet area or to their mailbox and such

Go Noodle, Simon Says, Calendar Songs

Sometimes I lead it, Go Noodle, DJ Raphi, various Brain Breaks videos and exercise videos

Teacher and student led activities, exercise videos

Just Dance videos, stretch breaks, walks, movement games, recess

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Additionally, the current study gathered information about the types of barrier teachers and teacher aids believe prevent the allocation of physical activity throughout the school day for students. The options listed were "limited time," "limited space," "lack of student motivation," "lack of resources," and an "other" option that allowed respondents to provide another reason. They were allowed to select more than one option. A majority of the answers (14 votes) indicated limited time, with limited space as a close second (13 votes). No one selected lack of student motivation or lack or resources. Two participants chose the "other" option and stated

"COVID and weather" and "COVID Guidelines." Due to recent events with the COVID pandemic many schools have been forced to use virtual learning.

Participants were asked if they continued to incorporate physical activity into class time if they were ever required to teach virtually. The majority (78.9%) answered yes to including physical activity breaks into virtual class time, while only 21.1% answered no. These data were further broken down by grade level. Five of the participants who work with multiple grade levels agreed that they still included physical activity exercises during class time while teaching virtually, and only one said that they do not. Those who selected that they still included exercise activities during virtual class time also included two first grade teachers, one second grade teacher, one third grade teacher, four kindergarten teachers, and two multiple disabilities teachers.

The survey asked participants to indicate all the aspects of classroom behavior they believe have been positively impacted for students by physical activity bouts throughout the school day. Such aspects included "academic performance," "focus," "behavior," "social/emotional," "memory," "energy level," "listening," and "motivation." An "other" section allowed participants to write in an answer that was not listed. They were allowed to vote on multiple options. Below is a summary of the results:

Table 4
Opinion-based Votes on Positively Impacted Areas for Students

Category	Number of votes
Behavior	17
Focus	16
Social/Emotional	16

Listening	16
Motivation	16
Academic Performance	13
Energy Level	11
Memory	5
Other	1
None	0

There were seventeen votes for behavior, sixteen votes for focus, sixteen votes for social/emotional, sixteen votes for listening, sixteen votes for motivation, thirteen votes for academic performance, eleven votes for energy levels, and five votes for memory. Focus is a notable area of improvement that teachers selected. Sixteen of the participants noted that they believe that focus is increased by the incorporation of physical activity in the classroom. One of the responses from a participant stated that, "it's important that students have some type of physical activity throughout the school day because it energizes them, and they feel more apt to focus on academic activities." Another comment made by a participant stated, "Everything is better the more we move. The kids are happier, they build relationships with their peers, and learn how to move their bodies/coordination."

The data suggested a possible correlation between a students' grade level and the benefits their teacher believes they gain from being physically active during the school day. Many of the participants who teach the same grade level submitted similar responses to this question. This observation could potentially indicate that physical activity affects children differently based on their grade level. Teachers and teaching aids who work in the multiple disabilities' unit all selected that they believe their students' behavior, their social and emotional skills, listening

skills, and motivation all improved through the incorporation of these activities. The majority of the participants who work in kindergarten classrooms selected all of the options listed in the survey. Focus, behavior, social and emotional skills, listening skills, and motivation are the options that were selected by the majority of the first-grade teachers. All of the participants who work solely in a third-grade classroom agreed that they believe physical activity improves a student's academic performance, focus, behavior, social and emotional skills, energy, and listening skills.

Discussion

Overall, results showed that the teachers and teachers aids included in this study had positive attitudes towards the incorporation of physical activity during class time. Additionally, participants make a strong effort to provide physical activity breaks for their students and believe that there is great value in doing so.

The current study has found that the inclusion of physical activity during class time is an established component of classroom management for the teachers surveyed. A majority of the answers indicated that these faculty have been including physical activity during class time for most of their teaching career. Nearly 90% of the participants see the value and make the incorporation of physical activity in the classroom a priority. Although class time is limited due to the intense curriculum for students, teachers must see value in physical activity throughout the school day. Some answers revealed that these teachers had not started integrating physical activity into class time until the past year or two. This could be due to a greater need for children to be active because of increased screen time. The Center for Disease Control and Prevention states that children, ages eight to eighteen, on average spend about seven and a half hours in front of a screen for entertainment. This statistic does not include the time children spend in front

of a screen for educational purposes (Center for Disease Control and Prevention, 2018). This issue has become increasingly prevalent as advancements have been made in technology. Research published in the Journal of American Medical Association, stated that the average amount of time Americans spend in front of a screen has nearly doubled between 2001 and 2016 (CardioSmart American College of Cardiology, 2019). This statistic is another key reason that the incorporation of physical activity in the classroom is so essential for students today.

There was variability among the data when participants estimated how much physical activity they believe students achieve throughout the school day (excluding physical education classes). Class activities may vary day to day, so this is a potential reason for the diversity among the results. Some school days may include a heavier academic load, allowing less time for physical activity. Other days may have a lighter curriculum and possible lessons that could allow for the students to be more active during class. A notable trend seen was that all of the participants who work in the multiple disabilities' unit estimated that their students are physically active for more than sixty minutes per day, which is greater than teachers in the class settings. This shows that being physically active plays an important role in class time for students with disabilities. These children experiencing disability may have less opportunities in participating in sports and exercise outside of school, so it is important that they are provided with the opportunity to be physically active during school. Data have shown that children with disabilities only reach about 14.6% of the total recommended physical activity per week (Emonson, McGillivray, Kothe, Rinehart, & Papadopoulos, 2019). Such disabilities that children are challenged with include impediments in several areas of functioning such as sensory and speech, psychological, physical, and/or intellectual. Physical activity is incredibly important for these children because it can provide many benefits to children with disabilities such as

preventing obesity, improving motor function, encouraging social interaction, and improving cognition (Emonson, McGillivray, Kothe, Rinehart, & Papadopoulos, 2019).

The review of literature conducted for this study suggested that the inclusion of physical activity in a student's daily school life has multiple benefits. These benefits include improved cognitive performance and classroom behavior such as increased concentration, speed processing, and attention span. The current study looked at the opinion of teachers who experience a student's academic life first hand. All the teachers in the study were in favor of the idea that physically active students have overall better academic and behavioral performance. They agreed that behavior, focus, listening, motivation, and social skills were positively impacted when physical activity was offered throughout the day. Although none of these areas of academic performance and classroom behavior were directly tested through standardized tests or observation studies, like they were in the previous literature studies discussed, the support comes from anecdotal information from professionals who witness children's school time behavior daily. One of the participants in the survey expressed that they themself do not like to work or listen nonstop while learning, so how are students who are filled with more energy expected to do so. Additionally, many participants made claims about the effectiveness physical activity has for a student's attention span. These claims support the information presented in the literature review on the importance of having breaks for students to engage in physical activity for more concentration and on-task behavior.

Interactive online videos were common among the types of activities students participated in during the school day. These videos include activities such as song and dance, a variety of exercises, and yoga. An interactive online computer program called "Go Noodle" (Go Noodle, Nashville, TN) was mentioned frequently in answers. This is a free program that can be

accessed by anyone online and was created by childhood development experts. There are a variety of physically active games and activities that will help children to be up and moving. Another technique that was common in the results was providing physical activity through teacher-led exercise or activities. Examples of such activities include Simon Says or a walk around the school. Simon Says is a great activity to get students up and moving as well as work on their listening skills by requiring students to follow directions while using up energy through physical movement. Walking around the school is another great activity especially when space in the classroom is a limitation. This can be as much as simply having the students walk up and down the hallway and then go back to class to become re-focused on the class work at hand.

The current study also suggests that teachers may have barriers that prevent them from keeping their students physically active throughout the school day. The issue with keeping students engaged with exercise activities is not suggested by a lack of effort or willingness on the teacher's part but other obstacles such as limited time or space. It may be obvious that the main priority in school would be a student's academic performance so if the curriculum for the day is packed full of tasks needed to get done it would be no surprise that exercise breaks do not take high priority. Further research needs to be done to see if physical activity breaks could help create more focus and efficiency in students which could in turn reduce the amount of time needed to complete academic tasks. Another obstacle is the lack of space in a classroom for students to get up and participate in different activities. Taking an entire class of students outside or to a larger room such as a gymnasium for exercise breaks could be an inefficient use of class time. The recent pandemic was also brought up as another barrier towards the incorporation of physical activity in the classroom and was noted by participants in the additional comment section when they brought up the point that COVID regulations may use up classroom space.

Requiring students to be a certain physical distance away from one another can take up a prominent amount of space in the classroom, making it nearly impossible to allow the students to get up and move.

This research also suggests that teachers see incredible value in physical activity for students because even with a virtual classroom a majority of the participants still included these movement breaks during their class time. Keeping students physically active may actually be more important than ever while teaching virtually because of the increase of screen time. Like how it would be in a physical classroom, these exercise activities may also have a positive impact on keeping students engaged and focused.

Finding ways to increase classroom physical activity needs to be made a high priority among school systems. One basis for this could be providing professional development programs about the use of classroom physical activity for teachers. Only forty-two percent of elementary school teachers have participated in professional development courses on techniques to integrate physical activity into the classroom (Center for Disease Control and Prevention, 2018). Teachers given more training on how to provide class time exercise activities effectively should be the first step.

There are additional guidelines that can be used to help reinforce regular physical activity in the classroom. Integrating physical activity into planned activities that apply academic concepts are a possible approach that could be used (Center for Disease Control and Prevention, 2018). Teachers would have to take on the responsibility of finding appropriate opportunities to incorporate physical activity into their lesson plans. This could be especially beneficial in instances where time constraints are limiting factors.

Additionally, the constraint of limited space can be addressed through creative ways to maximize space. Many classrooms are full of physical objects and furniture arrangements that create challenges and possible safety hazards for allowing students to move around for activities. Classrooms would need to be thoughtfully arranged and activities should be chosen based to accommodate for space limitations. In smaller spaces, teachers may need to lead activities that can be done at or next to students' desks (Center for Disease Control and Prevention, 2018).

Limitations

The current study was limited to a small sample size. For further insights this research should be conducted with a larger sample size. The sample was taken from one school so further research should be done using samples from multiple schools from a variety of areas. Results may be affected by the economic status and resources of a community. To make more generalized conclusions, data should be collected from multiple schools from a variety of socioeconomic demographics and availability of resources. Royalview Elementary School is located in a suburban medium sized town, made up of primarily middle to upper class families.

Additionally, forming potential conclusions based on grade level taught were slightly limited because many of the participants worked with multiple grade levels. Results were unable to suggest if there was a possible relationship between a participant's opinion on physical activity in the classroom and the grade level they teach. If the study were to be conducted again, participants should be limited to those who work with a single grade level to see if there is any correlation between the two factors. Teachers may also use different classroom physical activity programs based on the grade level. Some activities may be too complex for younger students while others may be too immature for the older students.

Another limiting factor that arose were the limitations due to COVID guidelines. All research was required to be conducted virtually and no contact with human subjects was permitted. A survey was chosen as the research method because it could be performed virtually to follow the COVID guidelines. In future research, direct contact with participants could be beneficial to gather more specific information. Direct observations of students and teachers in a classroom should be considered for future research once the COVID restrictions have been lifted.

If this study were to be conducted again, a question asking participants how they believe barriers against keeping students physically active can be overcome would be included. As people who work with children in an educational setting every day I think they would have great insight into making class time physical activity more achievable. I would also include a question for participants who included exercise breaks during virtual learning. They would be asked what types of activities they did and what outcomes they got from that experience. Results from these questions would be especially relevant in a society that has had to turn to virtual learning as the primary mode for education and could help to improve that education system.

The school that was included in this study seems to have a strong foundation for making physical activity a priority for learning and leading a lifelong healthy lifestyle by incorporating physical activity breaks during the school day and encouraging teachers who have strong feelings about the issue. This may not be the case in every school, so it is imperative that more research and attention is given to this topic. The youth in this country are the future for the United States so the pressure is high to create school environments that form well-rounded students. Not only does integrating physical activity during class time have potential to improve students' learning and classroom behavior but may help establish healthy lifelong habits.

As an exercise science student, I have always been educated on the importance of physical activity for not only physical health, but mental and emotional health as well. I wanted to take this opportunity to learn about the role physical activity plays in the education system through the perspectives of those who experience it firsthand. The results showing high levels of support for keeping students physically active were not surprising to me. There is much research and support that exercise is beneficial in many areas especially in education. What did surprise me was how much physical activity is actually included during class time. There can be many hardships against allowing students to participate in different physical activities throughout the day, so it is incredible that the teachers make it such a high priority. It is my hope that more research and attention is given to this subject so that other schools can experience the benefits that come with allowing their students to be physically active.

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Appendix A

Office of Research Administration
Akron, OH 44325-2102

NOTICE OF APPROVAL

Date: 2/16/21

To: Emma Vasek

From: Kathryn A Watkins, Associate Director and IRB Administrator

IRB Number: 20210114

Title: A Teacher's Perspective on the Impact of Physical Activity on Classroom Performance

Approval Date: 2/4/2021

Thank you for submitting your Change Request for review. Your change does not represent an increase in risk to subjects and qualifies for exemption from the federal regulations under the category below:

- ☐ **Exemption 1** – Research conducted in established or commonly accepted educational settings, involving normal educational practices.
- ☑ **Exemption 2** – Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior.
- ☐ **Exemption 3** - Research involving the use of benign behavioral interventions in conjunction with the collection of information from adult subjects through verbal or written responses (including data entry) or audiovisual recordings, and subjects have prospectively agreed to the intervention.
- ☐ **Exemption 4** – Research involving the collection or study of existing data, documents, records, biospecimens specimens, pathological specimens, or diagnostic specimens.
- ☐ **Exemption 5** – Research and demonstration projects conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine public programs or benefits.
- ☐ **Exemption 6** – Taste and food quality evaluation and consumer acceptance studies.
- ☐ **Exemption 7** – Research involving the use of a broad consent for the storage or maintenance of identifiable information and/or biospecimens for future research.
- ☐ **Exemption 8** – Research involving the use of a broad consent for the use of identifiable information and/or biospecimens for future research.

Annual continuation applications are not required for exempt projects. If you make changes to the study's design or procedures that increase the risk to subjects or include activities that do not fall within the approved exemption category, please contact the IRB to discuss whether or not a new application must be submitted. Any such changes or modifications must be reviewed and approved by the IRB prior to implementation.

Please retain this letter for your files. This office will hold your exemption application for a period of three years from the approval date. If you wish to continue this protocol beyond this period, you will need to submit another Exemption Request. If the research is being conducted for a master's thesis or doctoral dissertation, the student must file a copy of this letter with the thesis or dissertation.

☑ Approved consent form/s enclosed

Appendix B

Dear Mr. Pavelich:

I am writing to request permission to conduct a survey at Royalview Elementary School. I am currently enrolled in the Exercise Science program at the University of Akron, and am in the process of completing my honors research project.

I am asking for permission to send an anonymous survey through email to the faculty members. The survey will be asking questions about students' physical activity during the school day.

Your approval to conduct this survey would be greatly appreciated and if you have any questions my email and phone number are listed below.

If you agree to allow this survey to be conducted please sign on the line below.

[signature] 1-11-24

Signature Date

Principal

Title

Sincerely,
Emma Vasek
eav23@zips.uakron.edu
(330) 785-8193

NORTH ROYALTON CITY SCHOOLS

"We Inspire and Empower Learners"

Kirk V. Pavelich
Principal

Royal View Elementary School
13220 Ridge Road
North Royalton, Ohio 44133

Phone: 440-582-9080
Cell: 216-346-4350
Fax: 440-582-7254
kirk.pavelich@northroyaltonsd.org

Protocol Title: The Impact of Physical Activity Programs on Elementary School Students Academic and Behavioral Performance in the Classroom From a Teachers Perspective

Informed Consent Form
For Prospective Collection of Data/Information

Description: The purpose of this document is to invite you to participate in a research study that looks at teachers opinions on the relationship between physical activity and elementary school students. The principal investigator, Emma Vasek, will be conducting research through the Department of Sports Science & Wellness Education at the University of Akron. Teachers from Royalview Elementary School will be participating in this study. The goal of this study is to determine how teachers feel physical activity can impact their students performance in the classroom.

Procedures: Once you have signed the informed consent agreement you will be sent an email containing a link to take a survey. The survey will not require participants to include their name or demographic information. Participants will answer a series of questions regarding their opinions and experiences with incorporating physical activity throughout the school day. Once the survey is completed they will submit electronically.

Inclusion Criteria: Participants must be a teacher or teacher aid at Royalview Elementary School. They must work with students between kindergarten and fourth grade.

Exclusions: If you are not hired by Royalview Elementary School to work as a teacher or teacher aid you are not eligible to participate in the survey.

Risks: There are no physical risks of participating in this survey, all data will be collected electronically. Data will be kept anonymous to avoid any breach in confidentiality.

Benefits: You may benefit from participating by learning more about the potential positive impacts of including physical activity throughout the school day.

Once all the data is collected it will be analyzed and used to help draw conclusions about teacher's opinions on the relationship between physical activity and a student's academic and behavioral performance. Responses will be looked at in the form of graphs to note any common trends seen in the results. The final presentation will be in the form of a written report and will be used for an honors research project. The paper will be found on the University of Akron website for public access.

This research study has been reviewed and approved by The University of Akron Institutional Review Board (IRB). The IRB can be contacted by calling (330) 972-7666, for any questions regarding the rights of being a research participant.

I am aware that participating in this study is voluntary and I define myself as a faculty member of Royalview Elementary School. I understand that if I have any questions about this research study I can contact the investigator with contact information listed below. I fully understand that my answers to the survey will be used in this research study and that my identity will be kept anonymous. I understand that I will not receive any compensation for participating in this research study.

Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

_____ _____

Signature of participant Date

Approved University of Akron
Institutional Review Board
Exempt 2
2/4/2021

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Jennifer L Petty 2/9/21

Signature of participant Date

Jennifer.Petty@northroyaltonsd.org

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Mary E Hayn 2/8/21

Signature of participant Date

mary.hayn@gmail.com

This research study has been reviewed and approved by The University of Akron Institutional Review Board (IRB). The IRB can be contacted by calling (330) 972-7666, for any questions regarding the rights of being a research participant.

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Signature of participant

2/8/21

Date

lora.hertel@northroyalton.sd.org

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Tracy Csizmadia 2/8/21

Signature of participant Date

tracy.csizmadia@northroyaltonsd.org

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Signature of participant

2-8-21

Date

carrie@packardnet.com

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Cathy Rush 2-8-21

Signature of participant Date

cathy.rush5@gmail.com

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Donna Sadowski 2-08-21

Signature of participant Date

donna.sadowski@northroyaltonsd.org

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

LeAnn Morris 2-8-21

Signature of participant Date

leeann.morris@northroyalton-sd.org

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Barb McGaugh 2.5.21

Signature of participant Date

barbmc9c@gmail.com

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Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Tammie Lilly 2/5/21

Signature of participant Date

tammie.lilly@northroyaltonsd.org

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Jessi Kobza 2-5-21

Signature of participant Date

russojLe yahoo.com

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Sheri Miller 02·05·21

Signature of participant Date

Sheri. miller @ northroyaltonsd. org

miller. Sherid @ gmail. com.

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Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Judy Plonski 2/5/21

Signature of participant Date

judy.plonski@NorthRoyaltonsd.org

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Michelle Fozio 2/9/21

Signature of participant Date

michelle.fozio@northroyaltonSd.org

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Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Signature of participant

2/8/21
Date

Lyndseyorges

lyndsey.orges@northroyaltonsd.org

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Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Signature of participant

2/9/21
Date

nrteachmom@gmail.com

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Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Kathy Filuta 2/10/21

Signature of participant Date

kathleen.filuta@northroyaltonsd.org

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Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Lora Rung 2/10/21

Signature of participant Date

lora.rung@northroyaltonsd.org

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Debbie Ahearn 2-10-21

Signature of participant Date

debbie.ahearn@northroyalton sd.org

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Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Arynn Leety 2/10/21

Signature of participant Date

Arynn.leety@northroyaltonsd.org

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

[signature] 2/10/21

Signature of participant Date

Sma36@zips.uakron.edu

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

[redacted] 2-10-21

Signature of participant Date

Judy.Wilkosz@northroyaltonsd.org

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Sue Sutton
sue.sutton@northroyaltonsd.org

Signature of participant

2-10-21

Date

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Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Cheri L Rourke 2-10-21

Signature of participant Date

cheri.rourke@northroyaltonsd.org

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Contact information for questions regarding the study:

Emma Vasek (330) 785-8193 eav23@zips.uakron.edu

Signature of participant

2/11/2021

Date

Emma Vasek's Research Project

Teachers' Perspective on the Affects of Physical Activity in the Classroom

1. What grade level are you currently assigned? (Pick as many as apply)

Check all that apply.

- [ ] Kindergarten
- [ ] 1st
- [ ] 2nd
- [ ] 3rd
- [ ] 4th

Other: [ ] _____

2. Physical activity is any type of voluntary bodily movement. Do you provide any physical activity interventions for your students throughout the school day? (Answer yes if you allow your students to have at least one break during class time every day to get up and move or participate in a physical activity for at least five minutes.)

Mark only one oval.

- ◯ Yes
- ◯ No

3. What is the duration of each activity the students participate in?

_____

4. How long have you been incorporating physical activity into the school day for your students?

_____

5. What types of physical activities do students participate in? (Example- teacher led exercises, exercise videos, etc...)

_____

_____

_____

_____

_____

6. Excluding physical education classes, how much time would you estimate that students are physically active during each school day?

Mark only one oval.

- ◯ None
- ◯ <10 minutes
- ◯ 10-20 minutes
- ◯ 20-30 minutes
- ◯ 30-60 minutes
- ◯ >60 minutes

7. In your opinion, please select the factors that prevent you from allowing time for physical activity throughout the day.

Check all that apply.

- ☐ Limited Time
- ☐ Limited Space
- ☐ Lack of Student Motivation
- ☐ Lack of Resources

Other: ☐ _____

8. Which of the following areas do you believe have been positively impacted for students by physical activity throughout the school day? (You may select more than one)

Check all that apply.

- [ ] Academic Performance
- [ ] Focus
- [ ] Behavior
- [ ] Social/Emotional
- [ ] Memory
- [ ] Energy Level
- [ ] Listening
- [ ] Motivation
- [ ] None

Other: [ ] _____

9. If you have ever taught virtually, did you continue to include physical activity during class time?

Mark only one oval.

- ◯ Yes
- ◯ No

10. Do you have any additional comments about physical activity and overall student well-being?

_____

_____

_____

_____

_____