



Teacher Practices, Time for Physical Activity, and the School Day: A Preliminary Analysis

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Abstract

Existing data describe the positive relationships across children's play/physical activity, mental wellness, physical health, and intellectual success (Carter, 2016; Crnic & Kondo, 2019; English 2019; Tomporowski, Davis, Miller, & Naglieri, 2007). This current mixed-method study identifies ways in which classroom teachers describe implementing physical activity and play

opportunities during a typical school day. Classroom teachers (N = 511), pre-k through sixth grades, completed surveys identifying the types of play and physical activities (recess, games, movement) they implemented during the day, the time allowed for each type of experience, use of software to support the movement, and training associated with physical activity and play. Data describe teachers' pervasive use of GoNoodle as an activity break during the school day. These findings support previous research demonstrating a concern for children's outdoor recess time. Implications describe how teachers' lack of adequate training may undermine children's developmentally appropriate physical activities and play experiences. Authors discuss the potential of these data in planning for children's long-term physical and mental health and well-being.

Keywords: physical activity, recess, play, children's well-being, teacher planning

Background and Introduction

The premise for the current study is that appropriate physical activity and play significantly affect children's health, wellness, and academic learning (Motta, McWilliams, Schwartz, & Cavera, 2012; Pellegrini, 2005; Tomporowski et al., 2007). In spite of the data-driven and standards-based public-school arena, ensuring appropriate physical activity and quality play remain integral for children's holistic learning and development (Motta, 2018; NASPE, 2013). During the school year, children spend more than one thousand hours of their time in a classroom. These waking hours for children's learning and development become substantive in framing how they make future choices. Choosing to be inactive is a choice and leads to long-term harmful effects in adulthood (Booth, Roberts, Thyfault, Ruegsegger, & Toedebusch, 2017; Motta, et al., 2012). Physical activity is positively holistic and evidences far more benefits than what can be seen as merely a cathartic event or as means to winning a competitive game. Instead, physical activity is the natural way in which the body stimulates, supports, and changes body functions. Appropriate physical activities, in combination with current nutritional guidelines, evidence the potential to nurture children's long-term health and wellness (Motta et al., 2012; Pellegrini, 2005; Tomporowski et al., 2007).

In order to provide data to plan for the implementation of appropriate physical and play activities into the daily school routine, this study identifies the range and duration of different types of physical activities used by classroom teachers and describes teachers' practices to consistently include physical activity throughout the daily schedule. Additionally, the authors consider the contributions of play for children's learning and development and discuss how both physical activity and play remain integral in contributing to children's holistic health and wellness.

Review of the Literature

Physical Activity

Physical activity is any movement causing muscles in the body to contract beyond what they would at rest, which is a state of inactivity (Office of Disease Prevention and Health Promotion, 2016). Physical activity contains two components: 1) *Baseline activity* requires less energy and occurs in activities such as slowly walking or standing; 2) *Health-enhancing physical activity*

requires more energy and is associated with events such as dancing, climbing on playground equipment, or brisk walking. When individuals exhibit a minimum of baseline activity, they are inactive and not considered as taking part in the adequate amounts of physical activity. Children who take part in sixty minutes of health-enhancing physical activity a day meet the recommendations set by the Office of Disease Prevention and Health Promotion (2016).

Health-enhancing physical activities include outdoor recess and ‘break times’ within the classroom. ‘Break-times’ refer to amounts of time distributed throughout the day to allow students a change of pace from the traditional assigned academic tasks. For example, indoor breaks may include jumping jacks, running in place, or moving to a video/recording. In many instances, teachers claim children need to “get their wiggles out” and therefore ensure an outdoor recess or break-time activity during the school day. For some educators, the underlying belief is by their providing time for recess, play, or movement breaks, children release pent-up and surplus energy and become better able to return to the academic tasks with renewed focus. It is true that through physical activity, children become refreshed and more attentive in returning to school day routine; it is not because children released surplus energy. Research does not provide data to support a “Surplus Energy Theory” (Evans & Pellegrini, 1997).

Physical activity is holistic and proactive and leads to enhancing specific components of mental processing in social and cognitive development. When children engage in physical activity, such as stretching, amounts of cerebrospinal fluid in the central nervous system increase. Additionally, physical activity produces neurotransmitters within the body that become natural motivators: noradrenaline and dopamine help increase retention of learned material and increase the likelihood the child will feel energized as they learn new material (Jensen, 2013).

One of the long-term consequences for children who do not regularly take part in physical activity is the possibility of becoming overweight or obese. Childhood obesity continues to be a leading public health concern for both healthcare professionals and school personnel (Burriss & Harrison, 2004; Center for Disease Control and Prevention, 2018; Frye, 2018). *Obesity rates* remain at approximately 18 percent for the last ten years; 14 percent of children (ages two-to-five years of age, enrolled in the program Women, Infants and Children (WIC), represent *obese categories*. Furthermore, findings describe how nearly one-third (31.3 percent) of children, ages 10-to-17 years, can be categorized overweight or obese; data also describe 13.9 percent of high school students as *obese* (Center for Disease Control and Prevention, 2018, 2019a).

Childhood obesity increases the risk of a multitude of preventable diseases including Type 2 diabetes, asthma, high blood pressure, cardiovascular disease, colon cancer, and arthritis (Center for Disease Control and Prevention, 2015a, 2018, 2019a, 2019b). The combination of poor health status and lack of physical activity significantly affects a child’s long-term health and may lead to premature death (Center for Disease Control and Prevention, 2019a, 2019b). Carrel and Bernhardt (1996) indicate U.S. school personnel report a lack of training with regard to intervention and assert coordinating school efforts will diminish childhood obesity.

Physical activities include aerobic activity such as brisk walking or running. Critical for children’s development, physical activity promotes muscle and bone strengthening. Informed

adults/educators cautiously implement “age-appropriate” activities. Human bodies develop at different rates depending on age and other factors. Some physical activities represent higher quality and more appropriately target physiological needs of individual children than others. For example, it is important children do not take part in structured muscle-strengthening programs such as weightlifting, which places strain on muscles. Instead, play activities (jungle gyms and tree climbing) build strength (Centers for Disease Control and Prevention; Physical Activity Guidelines, 2020). In addition to supporting physical development, physical activity supports children’s mental health.

Mental Health

Mental health disorders do not only affect adults but children as well. Findings (Motta, et al., 2012; Oppizzi & Umberger, 2018) describe how exercise benefits students who might suffer from PTSD, anxiety, and depression. Physical activity provides benefits more so than psychotherapy and psychotropic medication because exercise is something children can engage during their natural daily activities (Motta et al., 2012).

During childhood, early warning signs for some conditions arise. These signs include mood, anxiety, and psychotic disorders such as depression, phobias, obsessive-compulsive disorders, bipolar disorder, and schizophrenia (The National Institute of Mental Health, n.d.). Children experience stressful and traumatic events which trigger emotions affecting their daily living. The National Institute of Mental Health (n.d.) identifies warning signs including:

Frequently feels very angry or very worried, cannot sleep or eat, is unable to enjoy pleasurable activities, isolates and avoids social interactions, feels grief for a long time after a loss or death, uses alcohol or drugs, obsessively exercises, diets and/or binge-eats, hurts other people or destroys property, exhibits low or no energy, smokes, drinks, or uses drugs, feels as if not in control of emotions, thinks of suicide, harms self-such as cutting or burning, and/or thinks mind is controlled or out of control (p. 1).

Through outdoor recess, play, and movement activities, knowledgeable teachers plan times during the school day for children’s physical activity. In support of children’s holistic learning and development, it is critical educators understand the research evidence for the relationship between physical activity, play, and wellness.

A variety of research studies describe the diverse ways in which physical activities positively target the whole child (Burriss & Burriss, 2011; Carrel & Bernhardt, 1996; Center for Disease Control and Prevention, 2015a, 2015b, 2018, 2019a, 2019b; Donnelly, Hillman, Castelli, Etnier, Lee, et al., 2016; Jensen, 2013; The National Institute of Mental Health, n.d.). Despite the multiple contributions of physical activity toward children’s holistic development, some school administrators perceive recess as lost instructional time and believe it is more important to focus on academic instruction (Pellegrini, 2005).

Recess

Throughout the United States, many school districts indicate decreasing the time for outdoor recess; diminishing time for recess and physical activity negate the relationship across physical

activity, recess, and children's wellness (Alexander, 1999; Burriss & Burriss, 2011; Kieff, 2001). As children continue to participate in an educational system requiring mastery skills in academics, there remains less of a focus for play and social activity. Reasons given for reducing recess time include high-stakes testing, liability issues, or stranger-danger (Burriss & Burriss, 2011). Recess provides children with opportunities and challenges not possible in the traditional indoor classroom (Stone, 1993). Outdoor recess allows space and equipment for children to engage in a range of different vigorous physical activities. Depending on children's ages, stages, and interests, outdoor recess promotes individual, small, and large group physical activity and play (Burriss & Foulks Boyd, 2005).

Play

Stone (2005) suggests teachers recognize free play is unlike active or outdoor learning. Free play helps develop cognitive, social, physical, and emotional skills that significantly affect the whole child. Play and games encourage children to apply their social cognitive skills to the demands of the game (Pellegrini, 2005). Schools can be the ideal environment for inviting, encouraging, and supporting children to participate in a range of play-generated physical activity opportunities.

Although play activities include categories referred to as "functional, constructive, dramatic, and games with rules" (Stone, 1993), for the current study, authors highlight the importance of "functional and games with rules." Functional play includes activities such as repeatedly running, jumping, or bouncing. The child moves merely for the pleasure of moving, and these gross motor activities may occur with or without interaction with objects. This play decreases as a child grows older, but when it can fully take place, children benefit with many opportunities for creative enjoyment (Centers for Disease Control and Prevention 2019a, 2019b; Stone, 1993; Stone, 1995). "Games with Rules" describe play which uses set boundaries of rules and regulations. Older children can think at an advanced cognitive level, understand directions, follow sequences, and regard rules. Older children can collaborate as a team-mate and know how to take turns. Younger children, not cognitively mature, will evidence difficulty in games that require following directions and turn-taking. It is common and appropriate for younger children to create their own rules for invented games. For example, an entire class may join in pretending to drive race cars as they run across the playground. Including sound effects, the children re-create the traditional running game of Follow-the-Leader (Stone, 1993). Additionally, children, particularly younger children, become associated with "rough and tumble" play (Reed & Brown, 2000). Through rough and tumble play, in addition to developing emerging respect for friends and an awareness of inappropriate players, children learn how to run with friends, fall appropriately, stretch arms and legs, and safely tumble. Rough and tumble play is most appropriate for children, and yet classroom teachers often perceive this play activity as inappropriate and potentially dangerous for children (Pellis & Pellis, 2007; Reed & Brown, 2000).

Educators, understanding what type of play is most appropriate for children's different ages and stages, become more able to prepare, monitor, and promote quality learning experiences (Frost, Wortham, & Reifel, 2005; Stone, 1993, 2005).

Children require adequate time to identify their play episode, choose play partners, and become physically active in their play; prior research describes at least 30 minutes essential to develop quality play experiences (Christie & Wardle, 1992). Through quality play, teachers provide physical activity for children and simultaneously support their learning, development, and adaptive functions. Play is an outlet for children; it allows them to express their feelings of happiness, worry, fear, or anxiety. Play affords children with opportunities to explore complex feelings in a risk-free and emotionally safe place (Stone, 1995).

In addition to physical, social, and emotional benefits, findings demonstrate gains to mental functioning in children related to exercise on tasks involving the use of executive functions (Tompsonski et al., 2007). Working memory, mental flexibility, and self-control reflect skills of executive control. Executive functions and self-regulation skills allow individuals to multitask, recall instructions, plan, and stay attentive. In order to learn these skills, children practice, rehearse, and apply the skills in a variety of situations. When developed, children and society benefit. It is crucial children participate in activities encouraging creative play and social connection. In addition to the benefits of physical activity, play experiences provide children with relevant opportunities to navigate stressful situations and assume control of their own actions (Centers on the Developing Child: Harvard University, 2016; Stone, 2005). Play and physical activity contribute toward children's physical, social, emotional, and intellectual well-being.

Physical Activity Alternatives

In addition to recess and play opportunities, teachers use apps and videos to plan for breaks and physical activity during instructional time. By using educational interactive learning apps and videos, such as GoNoodle (<https://www.gonoodle.com/>), teachers encourage children to become active. The vice president of GoNoodle believes that children are not receiving anywhere near their recommended daily sixty minutes of physical activity. Teachers in Knoxville, Tennessee, partnered with the health insurance company, Blue Cross Blue Shield of Tennessee, to launch the use of GoNoodle to aid in providing both brain and physical activity breaks for children. Children take part in a range of mini interactive videos, varying in length from three to five minutes requiring moderate to vigorous levels of activity. The videos also include learning materials teachers may easily incorporate into their lessons. Teachers describe how this type of program helps with classroom culture; student's seat-time diminishes, and participation increases in activities that promote engagement and focus (Knoxville New Sentinel, 2015).

To prepare environments that most effectively support children's holistic learning, educators plan for both physical activity and quality play experiences. Informed educators understand the human body requires physical activity to learn and develop. As teachers plan their daily schedules, they intentionally find times for a range of physical activity as well as incorporate play opportunities. On behalf of learning and development, in order to maximize time and effort, it is incumbent upon educators to understand the potential range of physical activity and play events and determine how to most appropriately integrate on behalf of children's different ages and stages.

Method

This mixed-method study asked classroom teachers to describe how often and in what ways they planned for physical activity during a typical school day. Specific research questions identified times in the school day set aside for recess, play, and physical movement activities. Rationalistic survey data and open-ended narratives describe teachers' practices and times allowed for different physical activity experiences.

Participants and Instruments

Teachers in three school districts (23 schools) in an urban area in the Southeastern United States received a 13-item survey. Central offices for each district forwarded the surveys to individual schools whereby school-staff disseminated surveys to individual teacher's mailboxes. A cover letter explained the researchers would return to the school to collect the anonymous completed surveys. In addition to the school districts, researchers distributed surveys to teachers enrolled in graduate courses at a university in an urban area in the southeastern United States. Researchers distributed 867 surveys, with a 58.9% return rate (N=511).

Analysis

Researchers used descriptive statistics to establish an initial baseline to describe how teachers incorporated physical activity and play during the school day. Data described additional ways teachers identified other forms of physical activity.

Using the SPSS 22.0 statistical package, results provided frequencies and categories; a constant-comparative approach (LeCompte & Preissle, 1993) interpreted teachers' open-ended narratives. For the qualitative analysis, two researchers independently read the teachers' open-ended responses and identified participants' similarities. Then, they jointly read the responses and discussed and shared coding strategies and, using participants' phrases, identified category names. Finally, researchers read through the narratives to identify discrepancies. For this last layer of analysis, researchers compared the quantitative analyses and narrative data sets to discover any inconsistencies.

Results and Discussion

Participants included teachers in grades K – sixth. Teachers included both male and female with an age range from 21 to 53+ as indicated in Table 1.

Table 1: Grade Level by Teacher Gender, and Teacher Grade Level by Age

Grade Level	Gender				Age			Total
	Male	Female	Other	Total	21-31	32-52	53+	
Kindergarten	1	79	3	83	29	48	5	82
Primary	0	16	--	16	6	7	3	16
First	1	71	--	72	22	42	7	71

Second	4	75	--	79	33	37	8	78
Third	4	72	--	76	40	31	6	77
Fourth	5	52	1	58	19	37	2	58
Fifth	2	48	--	50	11	34	4	49
Sixth	1	6	--	7	1	5	1	7
Other	2	8	33	43	1	5	1	7
Total	20	427	37	484	162	246	37	447

The following data in Table 2 revealed participants reported a range of planned daily physical activities. Teachers' data generated the following categories: (a) physical activity (n=376), (b) games (n=96), (c) play (n=6), and (d) other (n=76).

Table 2: Types of Physical Activity as Described by Teachers

Physical Activity	376
Play	6
Games	96
Other	76

Table Note: These numbers total more than N= 511 due to multiple responses.

In categorizing the hundreds of teachers' responses identifying the types of breaks allowed for children during a typical school day, "Physical Activity" occurred 67.9 % of the time, but "play" only 1.1 %. These data clearly indicate classroom teachers do not consider play as potential for children's physical activity. It is true not all play suggests physical activity, but an understanding of play does identify play as a viable alternative for physical activity (running, some games, jump ropes, some ball activity).

It is interesting to note that of the 359 written responses, 182 (50.6 %) referred to GoNoodle. This level of descriptions of using GoNoodle may indicate some confusion regarding the definition of "physical activity." The exploratory parameters of the current study did not provide

a way in which researchers may identify teachers' GoNoodle preferences. For this reason, it is uncertain whether the GoNoodle videos used by teachers involved vigorous physical activity (jumping, dancing, kickboxing) or, in contrast, provided children with minimal to moderate movement. A concern regarding minimal activity is not to negate the potential use of some GoNoodle videos as "brain breaks" from the routine, but a caution is that not all videos contribute to the 60 minutes of daily vigorous physical activity as recommended by the Center for Disease Control and Prevention (2019a). Additionally, it is critical to understand indoor physical activity breaks do not substitute for outdoor recess. While it is true one indoor basketball game may substitute for an outdoor basketball game, the premise for the current study is to consider play as a viable alternative for physical activity. This means, toward promoting physical activity, an understanding of the relationship across play, recess, and free choice becomes critical.

Recess

Outdoor recess provides children with experiences not possible in the indoor classroom (Burriss & Foulks Boyd, 2005). Four hundred and sixty-nine teachers reported recess as a part of the traditional school day. Despite the existing literature supporting the importance of children's recess (Alexander, 1999; Burriss & Burriss, 2011; Kieff, 2001; Pellegrini, 2005), the current findings indicate authors' concern regarding teachers' understanding of the relationship across space and equipment provided for recess, targeted activities during recess, and time allowed for recess activities. Data in Table 3 identifying recess occurred, on average, 6.14 times per week, with an average of 21.4 minutes per recess event.

Table 3: Average Number of Recess Breaks and Times

Categories	Average Breaks
Number of Breaks	6.14/week
Average Time	21.4 minutes/recess period

Influencing these results, 17 teachers reported 15 weekly recess breaks. While 15 recess events per week may be possible, researchers challenge these particular 17 data entries. Toward an understanding of the holistic benefits for children, it is important to consider not merely the number of recess events per week, but as well the average amount of time per recess event. Existing literature evidences children require adequate time (30 minutes) (Christie & Wardle, 1992) to establish play schemes such as making rules, establishing procedures, identifying leaders, and creating roles. Finally, the current study did not ask teachers to describe the options provided for children during their recess time. In addition to number of times and duration for each recess event, it is important to consider the variety of different spaces, range of complex materials, and potential surfaces provided for children's flexible, inclusive, and innovative physical activity and play. Children need time to develop their scripts and games; providing multiple recess breaks with minimal time (15 minutes) does not maximize children's physical

health and well-being. Once again, it is important to recall the purpose and population of the current study. Authors contend for younger and elementary aged children, the parameters defining physical activity should include play and recess and not be restricted to organized games such as soccer, basketball, or volleyball.

Teacher Knowledge.

Table 4: Teachers Indicating Specialized Training (n=197)

Specialized Training	Number of Participants (Percentages)
Yes	83 (42.2)
No	114 (57.8)

Advanced knowledge regarding physical activity and play becomes necessary in order for teachers to plan appropriate and holistic learning experiences. Toward successful implementation, teachers' understanding of how to design and use the outdoors is critical. The natural environment includes bushes, trees, flowers, dirt, and grass; the constructed environment may include climbing/sliding equipment, benches/tables, or a gazebo/stage. These current data evidence in Table 4 only 42.2 % of teachers reporting some prior training regarding physical activity; teachers' reports represent a wide range of training. Additionally, findings show 57.8% of teachers reported their receiving no training regarding physical activity. For those participants who reported some prior training associated with physical activity (42.2 %), it is important to consider the range of differences in types of training. For example, some teachers included a university course while others noted in-service or workshop sessions. In spite of school districts providing teachers with professional development in the areas of mathematics, literacy, and technology, what of physical activity and play? Of course, it would be imperative to explore what this training would look like. Would it be merely how to play various games, or would it involve children's physical development? This type of in-service support would ensure teachers extend their ability to secure children's safe and effective physical activity and play opportunities. Advanced knowledge is integral when supervising physical activity. The authors suggest, as is the case with other disciplines (math, literacy, science) that teachers engage in many and continuous in-service trainings regarding physical activity and play. It is critical teachers exhibit current knowledge in their understanding

In addition to understanding the most appropriate ways to incorporate physical activity and play, educators remain aware of the support and encouragement they provide. Bullying, gender bias, and rejection during physical activity and play can cause emotional issues with children, and lead to low self-esteem. Informed educators know how to support their students, so they plan physical activity and play as positive experiences rich with the potential for exploration and growth. The goal is for physical activity and play to be platforms to nurture children's health, wellness, and life success.

Physical Education

Physical education (PE) is a component of the curriculum and requires physical movement. Teachers (n = 460) described PE as offered on average 2.5 times per week with an average of 42.8 minutes per session. Considering the time required to transition to the gym, provide directions, and organize and distribute materials, these 42.8 minutes do not ensure this PE time is committed to vigorous physical activity. To support children's need for vigorous physical activity, it is important to consider, in addition to PE, other ways to create movement opportunities.

Games

The Games category showed a 17.33% of teachers used games as physical activity. As exploratory data, this category does not specifically describe what kinds of games teachers used to provide for physical activity. For example, some teachers listed a desk-top game as a break. This activity may be an appropriate brain break from the regular school routine, but does not provide children with vigorous physical activity. Furthermore, considering the primary ages of the children, the importance of recess and free play become affirmed and structured games diminish.

Conclusion

The findings support previous research demonstrating a concern for children's physical activity in schools. Findings also indicate the lack of adequate teacher training which may undermine children's developmentally appropriate physical activities and play experiences.

Future Research

One area of future research would be a study focusing specifically on teachers' use of GoNoodle. A study would allow researchers to more accurately identify and describe the range of this popular alternative. "What GoNoodle spots are used and why?" "What do teachers believe is gained by using the GoNoodle videos?" Current data show teachers widely use the GoNoodle as a physical activity break alternative. However, for physical activity breaks to truly help children, it is critical for teachers to understand the relationship between physical activity and children's development. In other words, merely using GoNoodle once or twice a day is not systematically integrating physical activity on behalf of children's holistic learning. "Why are some GoNoodle exercises more appropriate for some children's ages than others?" "How often should different GoNoodle videos be implemented?" While the GoNoodle alternative may be enjoyable, it is not the panacea for children's need for play and physical activity.

Additionally, future research exploring teachers' training/education in the areas of physical activity and play is important. Further research on this training deficit highlights the need for in-service support. Children's health and wellness remain vulnerable without an understanding of quality play and appropriate physical activity. Since children spend most of their day in the school environment, it appears reasonable for educators to assume responsibility to include time for physical activity and play. Implementing time for recess is still problematic. Current data suggest inconsistency between the times recess is offered each week and the time allowed during

each recess event. Data examining the kinds of physical activity and play children engage during recess remains important.

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