

ATTITUDES, PERCEIVED BENEFITS AND BARRIERS, AND PREVALENCE OF SCHEDULING RECESS BEFORE LUNCH: A SURVEY OF INDIANA ELEMENTARY SCHOOL PRINCIPALS

**Hannah Green, MS, RDN; Teresia Mbogori, PhD; James Stroud, PhD;
Carol Friesen, PhD, RDN, CD**

ABSTRACT

Purpose/Objective: Historically, school administrators schedule recess immediately after lunch. Recent research, however, suggests a plethora of benefits if recess is scheduled *before* lunch, including decreased plate waste, increased consumption of nutrients, and decreased discipline problems on the playground and in the lunchroom. The purpose of this study was to survey Indiana elementary principals to identify practices, perceived benefits and barriers, and attitudes toward scheduling recess before lunch (RBL) in Indiana.

Methods: Email addresses of Indiana principals were obtained from the Executive Director of the Indiana Association of State Principals. An anonymous, online survey was distributed via email to elementary principals (fifth grade or lower). The instrument was adapted from previous surveys that examined the impact of recess before lunch. Results were evaluated using frequencies and chi-square analyses. Open ended questions were analyzed for trends.

Results: A total of 527 useable surveys were completed from the 1,392 emails that were successfully delivered (37.9% response rate). Results indicate almost one-third (30.7%) of elementary schools scheduled RBL. The most common benefits of RBL included increased consumption of lunch, improved behavior in the cafeteria, and an increased focus on consuming lunch. Barriers that prevented schools from adopting a RBL policy included revising the daily schedule, the need to preserve academic hours, and lack of staffing. There were no differences when recess was scheduled based on location (urban, rural, suburban), type (private or public), enrollment (high vs. low/average) or percent free and reduced lunch ($p > 0.05$). Schools that offered only one lunch period were significantly more likely to schedule RBL ($AR=2.4$).

Applications to Child Nutrition Professionals: Results of this study delineate the prevalence of scheduling RBL, and identify benefits and barriers to this practice in one state. School Nutrition Professionals can use this information to encourage school administration to consider adopting a RBL policy.

Keywords: Recess, Recess Before Lunch, School Recess Policy, Barriers to Recess Before Lunch, Benefits of Recess Before Lunch

INTRODUCTION

Elementary students spend, on average, seven hours per day, five days per week, and 180 days per year, at school (National Center for Education Statistics, 2008). While lunch and recess – two components of any elementary school day – may seem trivial, both are important to the social and intellectual development of a child (Ishii, Shibata, Sato, & Oka, 2014). School lunch typically accounts for 25 to 30 minutes of the school day (School Nutrition Association, 2015), while recess typically accounts for 30 minutes (Indiana Department of Education [IN-DOE], 2017b). Together, lunch and recess account for approximately 180 hours over the school year.

Traditionally, if offered, recess is scheduled immediately after the lunch period. This practice, however, has been associated with a reduced consumption of food (i.e., increased plate waste) as children hurry to be “done” with their lunch so they can go outside and play (Price & Just, 2015). Several recent studies have suggested that moving recess *before* lunch results in a plethora of benefits that impact both students and the foodservice system, including a 54% increase in the consumption of fruits and vegetables (Price & Just, 2015), increased consumption of school lunch (i.e., reduced plate waste), improved behaviors in the lunchroom, an improved learning atmosphere, and increased time for students to meet with the teacher before going to recess (Strohbehn, Strohbehn, Lanningham-Foster, Litchfield, Scheidel, & Delger, 2016; Bergman, Buegel, Englund, & Femrite, 2004; Hunsberger, McGinnis, Smith, Beamer, & O’Malley, 2014; Price & Just, 2015; Stenberg & Bark, 2003).

Despite these documented benefits of scheduling recess immediately before lunch, and the recent encouragement by the Centers for Disease Control and Prevention (CDC) that schools schedule recess before lunch to help combat plate waste (CDC, 2017), little is known about what percent of our nation’s elementary schools currently follow this practice. Historically, according to the 2001 School Health Policies and Programs Study (SHPPS), 4.6% of elementary schools scheduled recess before lunch (Weschler, Brener, Kuester & Miller, 2001). By 2007, an estimated 10.4% of the nation’s elementary schools scheduled recess before lunch (Lee, Burgeson, Fulton, & Spain, 2007). By 2012, the USDA estimated that slightly more than one-third (37%) of the nation’s elementary schools scheduled recess before lunch (U. S. Department of Agriculture, 2012). Cited barriers to scheduling recess before lunch range from concerns regarding logistical concerns of supervision, hand washing, and cold weather clothing to preserving morning hours for academics to possible resistance by faculty, staff and parents (Rainville, Wolf, & Carr, 2006).

Recently, the Missouri Department of Education reported that 60% of their elementary schools schedule recess before lunch (Missouri Department of Health and Senior Services [MDHSS], 2016). When queried, the Indiana Department of Education indicated they did not know how many elementary schools in the state followed a “recess before lunch” schedule. With the accumulating body of evidence indicating the benefits of recess before lunch, and with the dearth of information about this practice in Indiana, the aim of this study was to identify the prevalence and perceived impact of scheduling recess before lunch in elementary schools in Indiana.

METHODOLOGY

Prior to initiating this study, the project was deemed exempt by the Ball State University Institutional Review Board. All researchers involved in the study completed the Collaborative Institutional Training Initiative (CITI) research ethics and compliance training.

Subjects

An electronic copy of the 2017-2018 Indiana School Directory was obtained from the Executive Director of the Indiana Association of School Principals. Removing all high school and middle school (schools where 6th grade was the lowest grade level) principals from the database, left us with 1,392 elementary school principals (1,161 public and 231 non-public). According to the online Sample Size Calculator from Creative Research Systems (<https://www.surveysystem.com/sscalc.htm>), using a 95% confidence level, a confidence interval of 4, and a population of 1392, we needed responses from 420 schools to obtain results that reflected the target population.

Instruments

A 20-question survey, adapted from two previous “Recess Before Lunch” data collection instruments (National Food Service Management Institute, 2008; Bark, Stenberg, Sutherland, & Hayes 2010), was developed by the researchers. The survey included a mixture of multiple choice, open ended, drop down list, and “check all that apply” questions that asked the respondent to identify the type of school (public or private), the number of students enrolled, the percent of students on free or reduced priced lunch, the number of recess periods offered to each grade, the timing of lunch and recess, factors that influenced the decision to adopt a recess before lunch policy (if adopted), perceived benefits and barriers associated with the timing of lunch and recess, and awareness of research regarding benefits of scheduling recess before lunch. Demographic information collected included the gender of the principal, length of time the respondent had been a principal (overall and at that specific school), geographic location of the school (urban, suburban or rural), and their Indiana School Nutrition Region.

Face and content validity of the survey were determined by five experts in the field, including an individual from the Indiana Department of Education, School and Community Nutrition unit, the Indiana State Coordinator for Action for Healthy Kids, a professor of Elementary Education in the College of Education at a Midwestern university, and two university faculty members with expertise in survey design and evaluation. The reliability of the survey was conducted by administering the survey to six elementary principals from a neighboring state twice within a period of a week. The reliability coefficient was determined from the surveys using Kappa coefficient. The calculated Kappa coefficient was 1.0, indicating agreement between survey attempts.

Data Collection

The link to an anonymous survey, created within the Qualtrics software platform (www.qualtrics.com), was embedded into an individualized email message that was sent to 1,392 Indiana elementary school principals using the email addresses provided to the researcher by the Executive Director of the Indiana Association of School Principals. Approximately ten days after the initial survey, a second individualized email was distributed, thanking those who had already responded and inviting those who had not yet responded to consider participating.

Data Preparation

Data was downloaded from Qualtrics directly into SPSS v. 23 for Windows for analysis (SPSS, 2016). Any survey that did not include the answer to the critical question, “When is recess scheduled at your school?”, was deleted from the analysis. Responses from principals who

indicated their schools offered recess both before and after lunch, were coded as a “recess before lunch” school in the analysis.

To determine if there was a relationship between school size and when recess was scheduled, each school was categorized into one of two groups based on the average number of students enrolled in public (mean enrollment=389) and private (mean enrollment=162) elementary schools in Indiana (Indiana Department of Education (DOE), 2017). A school was classified as having “average/low enrollment” if they enrolled ≤ 389 (public) or ≤ 162 (private) students; a school was classified as having “high enrollment” if they enrolled > 389 (public) or > 162 (private) students. The estimated poverty level of each school was established using the percentage of students on free or reduced-price lunch as a proxy. Qualitative data were organized into themes manually using Microsoft Word 2017.

Data Analysis

Descriptive statistics, including means, frequency counts were run on all variables. Frequency counts (number and percent) were used to determine the overall prevalence of specific survey questions. Responses from open-ended questions were recorded and analyzed for trends in barriers and benefits of scheduling recess before lunch. Chi-square analysis was used to identify statistical differences in responses to questions with nominal and ordinal variables, such as location of school, public or private school, number of lunch periods the school offers in a day, enrollment of the school, and the percentage of students on free or reduced lunch. Statistical significance was set at $p \leq 0.05$.

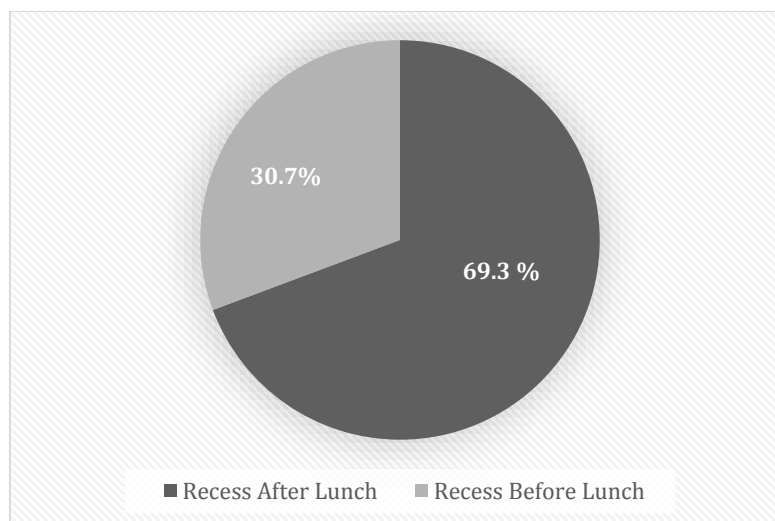
RESULTS AND DISCUSSION

Results

Overall, 599 surveys were received from the 1,392 Indiana elementary principals (43% response rate). The majority ($n= 422$; 70%) was received after the first email request; an additional 179 (30%) were received after the second email request. Of the 599 completed surveys, 72 (12%) were not usable as the respondent failed to answer the critical question “Do you schedule recess before or after lunch,” resulting in 527 usable surveys (37.9% response rate).

Results indicated that in Indiana, more than two-thirds (69.3%; $n =365$) of the schools follow the traditional pattern of scheduling recess after lunch. Slightly less than one-third (30.7%; $n=162$) indicated they scheduled recess *before* lunch (Figure 1).

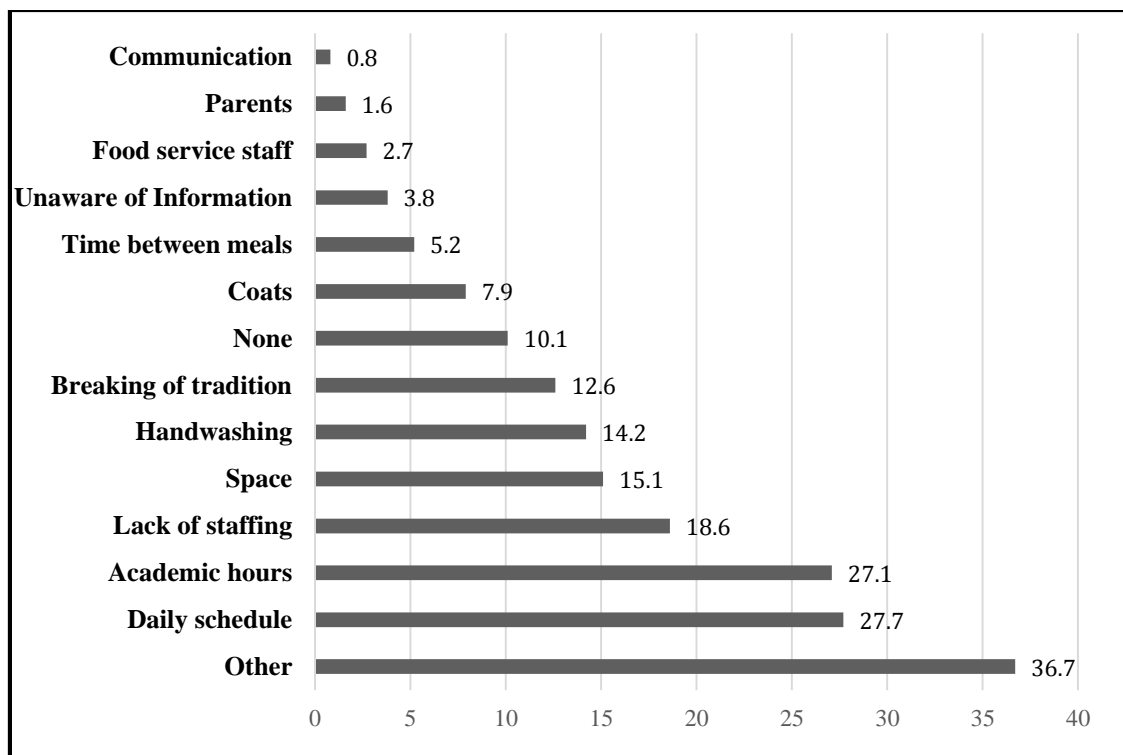
Figure 1. Percentage of Indiana Elementary Schools that Schedule Recess either Before or After Lunch ($n=527$)



Recess Scheduled After Lunch

Principals who scheduled recess after lunch (n=365) cited many barriers that prevented them from scheduling recess before lunch, including the need to revise the daily schedule (27.7%; n=101), need to maintain academic hours (27.1%; n=99), lack of staffing (18.6%; n=68), inadequate space in the lunchroom and playground (15.1%; n=55), handwashing procedures (14.2%; n=52), and not wanting to break tradition (12.6%; n=46). Other barriers cited by principals who did not schedule recess before lunch included increased time between breakfast and lunch (5.2%, n=19), being unaware of research on the topic (3.8%, n=14), resistance from food service staff (2.7%; n=10), resistance from parents (1.6%; n=6), and the need to communicate more with staff (0.8%; n=3). Only 10.1% (n=37) indicated they did not experience any barriers (Figure 2). Despite not scheduling recess before lunch, most participants indicated they would *consider* scheduling recess before lunch (81.4%; n =297). Overall, more than half of the principals (53.4%; n=195) indicated that they were unaware of the research surrounding recess before lunch.

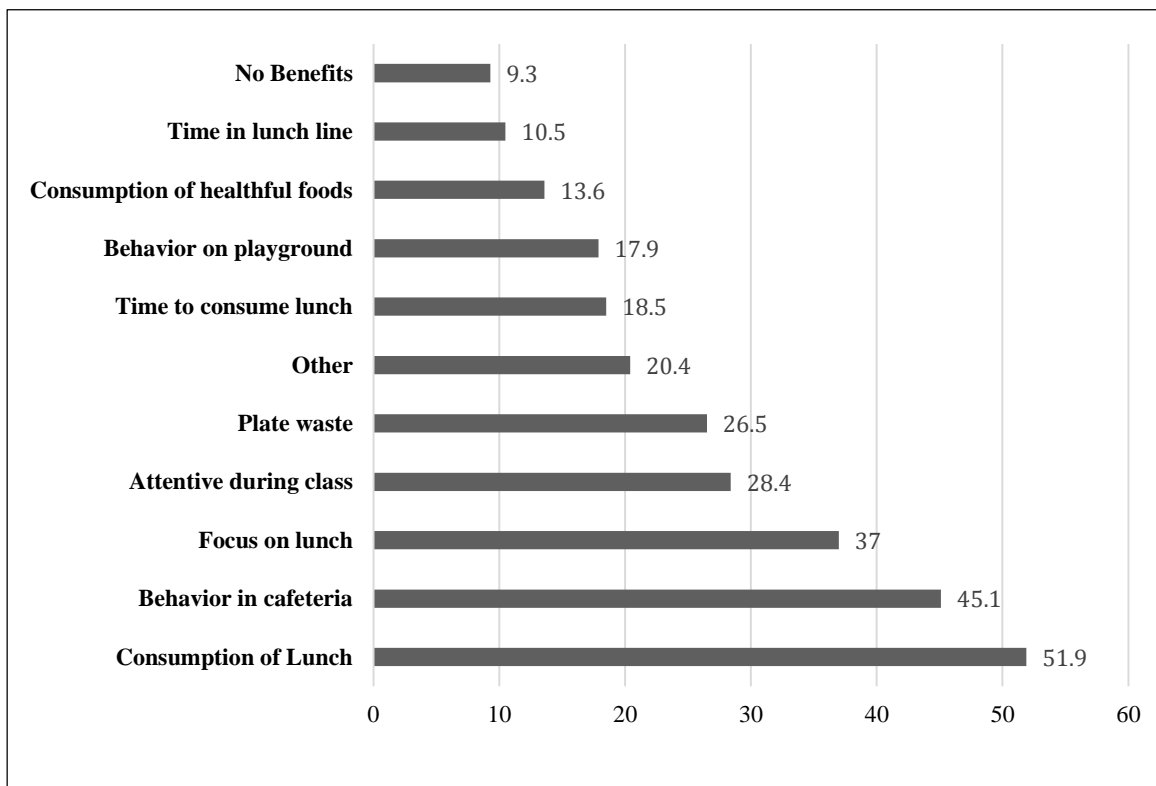
Figure 2. Barriers that Prevented Indiana Elementary Principals from Scheduling Recess Before Lunch, Percent of Responders (n=365)



Recess Scheduled Before Lunch

Principals from schools that scheduled recess before lunch indicated there were many benefits associated with this practice, including an increased consumption of lunch (51.9%; n =84), improved behavior in the cafeteria (45.1%; n=73), increased focus on consuming lunch (37%; n=60), students being more attentive during class (28.4%; n=46), decreased plate waste (26.5%; n=43), increased time to consume lunch (18.5%; n=30), improved behavior on the playground (17.9%; n=29), increased consumption of healthful foods (13.6%; n=22), and decreased student wait time in lunch line (10.5%; n=17). Only 9.3% (n =15) of principals stated they saw no specific benefit from scheduling lunch before recess (Figure 3).

Figure 3. *Principal-Perceived Beneficial Behaviors Attributed to Scheduling Recess Before Lunch at Indiana Elementary Schools, Percent of Responders (n=365)*



Principals who scheduled recess before lunch indicated that their decision was influenced by current research that touted the practice (37%; n=60), by school faculty or staff (22.8%; n =37), or by the School Board or School Commission (2.5%; n=4). One-quarter of the respondents (25.3%; n=41) indicated the recess before lunch policy was already in place when they became principal.

The feedback received by the principals from parents, students, and staff regarding scheduling recess before lunch was almost exclusively positive or neutral. The most positive feedback was received from the staff (50.6%; n=82), followed by more than one-third of the students (38.3%; n=62), and slightly less than one-quarter of the parents (22.2%; n=36). In general, feedback received by the principals from the parents (58%; n=94) and students (42%; n=68) tended to be neutral. The principals indicated they had received very little negative feedback from parents (1.2%; n=2), students (1.3%; n=3), or staff (3.7%; n=6). Most of the principals who scheduled recess before lunch (82.1%, n=133) stated they would recommend this scheduling practice to

other schools; only 5.6% (n =9) of the principals indicated they would *not* recommend scheduling recess before lunch.

Differences in Responses Based on School Characteristics

There were no differences detected when recess was offered (i.e., before or after lunch) based on the geographic location of the school (i.e., urban, suburban, or rural location) ($p=0.220$), by type of school (i.e., public or private) ($p=0.502$), by the percent of students who received free or reduced price lunch ($p=0.566$), or by size (i.e., “average/low enrollment” or “high enrollment”) for either public ($p=0.266$) or private schools ($p=0.805$) (Table 1).

The number of daily school lunch periods ranged from one (n=35) to five (n=66), with three lunch periods per day (n=136) being the most common. Schools that only had one lunch period were more likely to schedule recess after (n=30, Adjusted Residual (AR) =2.4), rather than before, lunch (n=5). In contrast, schools with two lunch periods were most likely to offer recess before lunch (n=32; AR=2.6) compared to after lunch (n=39). Schools with 2 lunch periods were the most likely to schedule recess before lunch compared to schools with any other number of lunch periods.

Table 1. *Scheduling of Recess Based on Location, Type of School, Poverty Level, Enrollment, and Number of Lunch Periods (n=529).*

	N	Recess Before	Recess After	Chi Square	P
Location¹					
Urban	132	39	93	3.03	0.220
Suburban	161	56	105		
Rural	201	53	148		
Type of School					
Public	387	112	275	1.39	0.502
Private	98	34	64		
Other	12	3	9		
Poverty Level²					
Low	77	27	50	2.35	0.502
Mid-Low	116	31	85		
Mid-High	96	29	66		
High	50	12	38		
Enrollment³- Public					
Low/Average	146	47	99	1.24	0.266
High	238	64	174		
Enrollment⁴- Private					
Low/Average	44	16	28	0.06	0.805
High	53	18	35		
Number of Lunch Periods					
1	35	5	30	12.82	0.021
2	71	32	39		
3	136	39	97		
4	78	27	51		
5	66	21	45		

¹ Geographic location of school was self-defined by the principal.

² Poverty level was categorized using the percentage of students on free or reduced-price lunch. Low- 0-25% of students, Mid-low- 25.1-50% of students, Mid-high- 50.1-75%, and High- 75.1-100%.

³ Enrollment for public schools were categorized using average enrollment of public schools in the state of Indiana enrollment, which is 389(<https://www.doe.in.gov/accountability/find-school-and-corporation-data-reports>). ≤389 was considered Low/Average and schools with >389 enrolled were considered High.

⁴ Enrollment for private schools were categorized using the average enrollment of public schools in Indiana which is 162(<https://www.doe.in.gov/accountability/find-school-and-corporation-data-reports>), Enrollment ≤162 was considered low/average and enrollment >162 was considered high.

Discussion

In a nationwide survey that focused on physical activity, Lee et al. (2007) reported that 96.8% of elementary schools regularly schedule recess; of these, only 10.4% regularly scheduled recess immediately *before* lunch. The results of this survey indicated that in the fall of 2017 in Indiana, three times more elementary schools offered recess before lunch (30.7%). In Missouri, 60% of schools and in Montana, 33% of schools have recess before lunch for all or some of their students (Missouri School Nurse Survey, 2016; U. S. Department of Agriculture, 2015).

Although over half (51.9%) of the principals cited “increased consumption of lunch” as the greatest perceived benefit of scheduling recess before lunch, only 13.9% indicated they thought recess before lunch was associated with an “increased consumption of healthful foods.”

Hunsberger et al. (2014) found no difference in the consumption of calories, iron, protein, vitamin C, or vitamin A when comparing the nutrients of meals consumed by students who had recess before and after lunch. Milk consumption, however, was 1.3oz greater in the recess before lunch group (5.7 oz vs. 4.4 oz); 20% more of the students in the recess before lunch group drank the entire carton of milk (42% vs. 25%, $p < 0.0001$), making the students in the intervention group 1.5 times more likely to meet the nutritional guidelines for calcium (≥ 267 mg, $p = 0.01$).

Research related to the impact of scheduling recess before lunch on plate waste in schools has been conflicting. Although Bergman et al. (2004) found that plate waste decreased from 40.1% to 27.2% when recess was scheduled before lunch, Strohbehn et al. (2016) found varying plate waste results at three different schools, while Tanka et al. (2005) and Stenberg and Bark (2003) found no difference in plate waste when comparing recess before and after lunch. Although plate waste was not measured in the present study, the principals indicated a decrease in plate waste was a moderate benefit in both groups. In schools that had a recess before lunch policy, 26.5% of principals indicated decreased plate waste was a benefit. It should be noted that the methods used to measure plate waste differed in existing studies of recess before lunch, making it difficult to delineate the true impact of recess before lunch on plate waste. Additional research is needed to clarify the effect of the timing of recess on plate waste.

Rainville et al. (2006) cited many barriers to scheduling recess before lunch, including preservation of academic hours, supervision concerns, hand washing concerns, and concerns of breaking tradition. In the present study, issues associated with having to revise the daily schedule (27.7%) and needing to preserve academic hours (27.1%) – especially maintaining the time allotted to reading block periods – were the most commonly cited barriers to scheduling recess before lunch.

In general, the feedback received by the principals from parents, students, and staff regarding offering recess before lunch was either positive or neutral in tone. Parents and students were primarily neutral in their feedback (i.e., it didn't matter one way or the other), while the feedback from the staff was mostly positive. Using a research design similar to the present study, Bounds and Nettles (2008) also found the feedback from school staff to be mostly positive. In contrast to the present study, however, these researchers reported more positive feedback from parents and students than the obtained in the current study. Both the current study and that of Bounds and Nettles (2008) reported the majority of principals was extremely positive about recommending scheduling recess before lunch to other schools.

Different characteristics of schools (i.e., geographic location, private versus public, economic level) have been shown to influence school health-related policies. For example, Catholic, private, and smaller schools commonly have more lenient health policies than those of larger public schools (Balaji et al., 2010). Caspi et al. (2015), in a study performed between 2008 and 2012, found that healthy eating practices declined in secondary city schools, but remained

constant in rural and town schools. In the current study, there were no differences found in the scheduling of lunch and recess by type of school (public or private), geographical location of the school (rural, suburban, or urban), poverty level (low, mid-low, mid-high, and high), or school enrollment (“average/low enrollment” or “high enrollment”). Results of the present study contradict those of O’Leary, Stendell-Hollis, Beeson, and Ogan (2017) who found that low enrollment schools were least likely to schedule recess before lunch and high enrollment schools were most likely to schedule recess before lunch.

Significant differences in when lunch and recess were scheduled were found based on the number of lunch periods a school offered, with schools that have two lunch periods significantly more likely to offer recess before lunch than schools with any other number of lunch periods. In contrast, schools that had only one lunch period were more likely to offer recess after lunch than schools with three or more lunch periods. Complications associated with scheduling around other grades’ lunch periods was the most frequently cited barrier associated with scheduling recess before lunch, with the scheduling becoming more complicated as the number of serving periods and the number of uses of the space increased (i.e., the cafeteria space was used for multiple purposes throughout the day, including band, choir, or gym). Offering more lunch periods would mean principals have even more class periods around which they must schedule, making it more difficult to implement a recess before lunch policy.

Despite the few barriers, school foodservice directors are urged to work with their principals and school district representatives to review and revise their school wellness policies to ensure students have adequate time to eat (i.e., a full 20 minutes to eat with a total lunch period of not less than 30 minutes) (Hildebrand, Ely, Betts & Gates, 2018) and, if not already being done, to initiate a conversation about scheduling recess before lunch with school administration.

CONCLUSION AND APPLICATION

Organizations, including the Centers for Disease Control and Prevention (2017) and the United States Department of Agriculture (2015), recommend that schools schedule lunch before recess to help decrease the amount of plate waste in schools. Many cited benefits, including improved behavior in the cafeteria and on the playground, improved attentiveness during class, and increased time to consume lunch, have been found when scheduling recess before lunch. Nonetheless, many schools have not adopted this schedule change.

The actual benefits associated with scheduling recess before lunch were almost identical to the perceived benefits indicated by principals who do not schedule recess before lunch. This observation indicates the perceived benefits of scheduling recess before lunch can become a reality with the schedule change. The benefits and barrier reported in this study are consistent with results of other studies conducted to investigate the effects of scheduling recess before lunch (Bergman et al., 2004; Fenton et al., 2015; Hunsberger et al., 2014; Rainville et al., 2006; Strohbehn et al., 2016; Tanka et al., 2005).

In this study, principals of schools who scheduled recess before lunch indicated that research on the topic was the greatest influence that caused them to change the order of recess and lunch. Those who champion scheduling recess before lunch should be encouraged to share relevant research, and raise awareness of this practice with stakeholders, including principals, staff, students and parents. The *Recess Before Lunch* toolkit (Missouri Department of Health and Senior Services, 2016), the Action for Healthy Kids (2018) Recess Before Lunch toolkit, Iowa Recess Before Lunch (Delger, Scheidel, & Strohbehn, 2014) and the Montana Team Nutrition’s Recess Before Lunch: A Guide for Success (Stenberg & Bark, 2003) are all excellent resources that can be shared with key stakeholders. Perhaps if more principals and school faculty become knowledgeable about this topic, the more likely this practice will become prevalent.

The primary strength to this study is the large sample size. This study was able to reach many elementary school principals in the state of Indiana to collect their opinions on scheduling recess before lunch. Another strength of this study was the use of the validated survey instrument that was adapted from existing surveys.

Every study has limitations; this study is no exception. In the present study, the only response options offered for the question “When do you schedule recess?” were “before” and “after” lunch. The researchers encourage adding a third option, “both before and after lunch” to the instrument, as several principals emailed the researchers to indicate that was their practice. It is unknown how many principals did not respond to the survey because their specific scenario was not provided as an option. In the present study, all of the schools that indicated they offered recess both before and after lunch (n=57; 16%) were categorized in the “before” analysis. In future studies, removing these schools or including a third group (i.e., recess before, recess after, and recess both before and after) would provide added insight and clarity. In addition, the present study failed to ask whether the school participated in the National School Lunch Program (NSLP). Examining differences in barriers and practices related to scheduling recess before lunch between schools that do and do not participate in the NSLP would indicate what role the NSLP plays in preventing or promoting a recess before lunch policy.

Future research needed to solidify the impact of a recess before lunch policy includes the need to collect additional evidence-based data, rather than relying on self-reported comments and opinions of principals. Quantitative analysis of plate waste and food cost savings from an intervention study could help prove the financial benefits of scheduling recess before lunch. Obtaining opinions of foodservice personnel would add to the depth of the results. Foodservice workers are at the frontline of providing students with nutritious meals; they would witness firsthand the positive and negative impacts of scheduling recess before lunch on the students, and on the foodservice operation. They would be the primary source as to whether there was an observational decrease in plate waste, an increase in healthful foods choices, and improved behaviors in the cafeteria. Foodservice workers would also have the best sense of the flow of schedule during the lunch period. Obtaining the input of school foodservice directors, supervisors, managers, and employees is a critical and necessary “next step” in the process of determining barriers and benefits to a recess before lunch policy.

This study aimed to identify the prevalence of recess before lunch in Indiana’s elementary schools and the principal-reported benefits and barriers to the schedule change. Slightly less than one in three (30.7%) elementary schools in Indiana reported scheduling recess before lunch. From this study, barriers and benefits were identified. Benefits included increased consumption of school lunch, improved behavior in the cafeteria, and an increased focus on lunch. The most common barriers included revision of the daily schedule, preservation of academic hours, and other barriers not listed. Most of the schools that do not schedule recess before lunch stated they were not aware of the research surrounding the topic. Geographic location of the state of Indiana, enrollment, and poverty level did not influence whether a school scheduled recess before lunch, while the number of lunch periods offered did influence whether a school scheduled recess before lunch.

It is anticipated that increased awareness and promotion of a recess before lunch policy will increase the prevalence, and thus increase the benefits from school lunch and school recess. School Nutrition Professionals and school board members--at both the school or district level – are encouraged to use the information from this study to guide them as they contemplate implementing a recess before lunch policy in their school or district. Armed with evidence about benefits, and with a plan in place to address barriers, it is hoped that foodservice personnel and

other champions will be successful as they aim to convince decision-makers to adopt a recess before lunch policy in their school or school district.

REFERENCES

- Action for Health Kids. (2018). Recess before lunch. Retrieved from <http://www.actionforhealthykids.org/tools-for-schools/find-challenges/cafeteria-challenges/1232-recess-before-lunch>.
- Balaji, A. B., Brener, N. D., & McManus, T. (2010). Variation in school health policies and programs by demographic characteristics of US schools, 2006. *The Journal of School Health, 80* (12), 599-613.
- Bark, K., Stenberg, M., Sutherland, S., & Hayes, D. (2010). Scheduling recess before lunch: Exploring the benefits and challenges in Montana schools. *School Nutrition Association, 34* (2), 1-8. Retrieved from <https://schoolnutrition.org/5--News-and-Publications/4--The-Journal-of-Child-Nutrition-and-Management/Fall-2010/Volume-34,-Issue-2,-Fall-2010---Bark;-Stenberg;-Sutherland;-Hayes/>.
- Bergman, E. A., Buerge, N. S., Englund, T. F., & Femrite, A. (2004). The relationship of meal and recess schedules to plate waste in elementary schools. *The Journal of Child Nutrition and Management, 28*(2), 1-11. Retrieved from <https://schoolnutrition.org/NewsPublications/JCNM/2004/Fall/>.
- Bounds, W. & Nettles, M. F. (2008). Investigation of school professionals' perceptions and practices regarding issues influencing recess placement in elementary schools. *National Food Service Management Institute*, Item Number R-120-08 (GY 06). Retrieved from <http://www.nfsmi.org/documentlibraryfiles/PDF/20090528034728.pdf>.
- Caspi, C. E., Davey, C., Nelson, T. F., Larson, N., Kubik, M. Y., Coombes, B., & Nanney, M. S. (2015). Disparities persist in nutrition policies and practices in Minnesota secondary schools. *Journal of the Academy of Nutrition and Dietetics, 115* (3), 419-425. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4344858/>.
- Centers for Disease Control and Prevention. (2017). Recess planning in schools: A guide to putting strategies for recess into practice. *Centers for Disease Control and Prevention*. Retrieved from https://www.cdc.gov/healthyschools/physicalactivity/pdf/2016_12_16_schoolrecessplanning_508.pdf.
- Delger, Scheidel, & Strohbehn. (2014). Iowa recess before lunch. *Iowa Team Nutrition*. Retrieved from https://educateiowa.gov/sites/files/ed/documents/1415_np_lt_IRBL_Guide.pdf.
- Fenton K, Rosen NJ, Wakimoto P, Patterson T, Goldstein LH, Ritchie LD. (2015). Eat lunch first or play first? Inconsistent associations with fruit and vegetable consumption in elementary school. *J Acad Nutr Diet. 115*(4):585-592.

- Hildebrand, D., Ely, C.M., Betts, N.M., and Gates, G.E. (2018). Time to eat school lunch affects elementary students' nutrient consumption. *Journal of Child Nutrition & Management*, 42(2). Retrieved from <http://schoolnutrition.org/newspublications/jcnm/2018/fall/>.
- Hunsberger, M., McGinnis, P., Smith, J., Beamer, B. A., & O'Malley, J. (2014). Elementary school children's recess schedule and dietary intake at lunch: A community-based participatory research partnership pilot study. *BMC Public Health*, 14, 156-156. doi:10.1186/1471-2458-14-156.
- Indiana Department of Education. (2017a). Program year 2017: Participation data. *Indiana Department of Education*. Retrieved from <http://www.doe.in.gov/sites/default/files/nutrition/programyear2017schoolprofile.pdf>
- Indiana Department of Education. (2017b). Indiana model school wellness policy on physical activity and nutrition. *Indiana Department of Education*. Retrieved from www.doe.in.gov/sites/default/files/nutrition/inmodelwellness.docx
- Ishii, K., Shibata, A., Sato, M., & Oka, K. (2014). Recess physical activity and perceived school environment among elementary school children. *International Journal of Environmental Research and Public Health*, 11(7), 7195-7206. doi:10.3390/ijerph110707195.
- Lee, S. M., Burgeson, C. R., Fulton, J. E., Spain, C. G. (2007). Physical education and physical activity: Results from the School Health Policies and Programs Study 2006. *J. Sch. Health*, 77, 435-463.
- Missouri Department of Health and Senior Services. (2016). Discover the benefits: Recess before lunch toolkit for Missouri schools. Missouri Team Nutrition Retrieved from <http://health.mo.gov/living/families/schoolhealth/pdf/morecess-before-lunch-toolkit.pdf>.
- Missouri School Nurse Survey, Rates of Recess before lunch in Missouri schools. (2016). *Department of Health and Senior Services*.
- National Center for Education Statistics. (2008). School and staffing survey (SASS). *National Center for Education Statistics*. Retrieved from https://nces.ed.gov/surveys/sass/tables/sass0708_035_s1s.asp.
- National Food Service Management Institute. (2008). Investigation of school professional's perceptions and practices regarding issues influencing recess placement in elementary schools. *National Food Service Management Institute*. Retrieved from <http://www.nfsmi.org/documentlibraryfiles/PDF/20090528034728.pdf>.
- O'Leary, K., Stendell-Hollis, N., Beeson, T., & Ogan, D. (2017). Scheduling recess before lunch: Perceptions of Washington state public elementary school professionals. *Central Washington State University*, 1-59. Retrieved from <http://digitalcommons.cwu.edu/cgi/viewcontent.cgi?article=1683&context=etd>.
- Price, J., & Just, D. R. (2015). Lunch, recess and nutrition: Responding to time incentives in the cafeteria. *Prev Med*, 71, 27-30. doi:10.1016/j.ypmed.2014.11.016.

- Rainville, A. J., Wolf, K. N., & Carr, D. (2006). Recess placement prior to lunch in elementary schools: What are the barriers? . *The Journal of Child Nutrition and Management*, 30(2), 1-8. Retrieved from https://schoolnutrition.org/uploadedFiles/5_News_and_Publications/4_The_Journal_of_Child_Nutrition_and_Management/Fall_2006/8-rainville.pdf.
- School Nutrition Association. (2015). School meal trends and stats. School Nutrition Association. Retrieved from <https://schoolnutrition.org/AboutSchoolMeals/SchoolMealTrendsStats/>.
- Stenberg, M., Bark, K., Montana Office of Public Instruction, & The Montana Team Nutrition Program. (2003). A recess before lunch policy implementation guide. *Montana Office of Public Instruction*. Retrieved from <https://healthsiouxland.org/wp-content/uploads/2017/06/RBLGuide2008.pdf>.
- Strohbehn, C. H., Strohbehn, G. W., Lanningham-Foster, L., Litchfield, R. A., Scheidel, C., & Delger, P. (2016). Impacts of scheduling recess before lunch in elementary schools: a case study approach of plate waster and perceived behaviors. *The Journal of Child Nutrition and Management*, 40(1), 1-13. Retrieved from https://schoolnutrition.org/uploadedFiles/5_News_and_Publications/4_The_Journal_of_Child_Nutrition_and_Management/Spring_2016/6-ImpactsofSchedulingRecessBeforeLunch.pdf.
- Tanaka, C., Richards, K. L., Takeuchi, L. S. L., Otani, M., & Maddock, J. (2005). Modifying the recess before lunch program: A pilot study in Kaneohe elementary school. *Californian Journal of Health Promotion*, 3(4), 1-7. Retrieved from http://cjhpf.fullerton.edu/Volume3_2005/Issue4-Hawaii/01-07-tanaka.pdf.
- U. S. Department of Agriculture Food and Nutrition Service. (2012). School nutrition dietary assessment study IV summary *United States Department of Agriculture Food and Nutrition Services*. Retrieved from https://fns-prod.azureedge.net/sites/default/files/SNDA-IV_Summary.pdf.
- U. S. Department of Agriculture. (2015). Recess before lunch- the secret ingredient of Montana's school lunch program. *U.S. Department of Agriculture*. Retrieved from <https://www.usda.gov/media/blog/2015/09/29/recess-lunch-secret-ingredient-montana-school-lunch-program>.
- Wechsler, H., Brener, N. D., Kuester, S., & Miller, C. (2001). Food Service and foods and beverages available at school: results from the School Health Policies and Programs Study 2000. *The Journal of School Health*, 71 (7), 313-324. Retrieved from <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1746-1561.2001.tb03509.x>.

BIOGRAPHY

Hannah Green, MS, RDN is a Graduate Student in Nutrition and Dietetics. Teresia Mbogori, PhD is Assistant Professor of Nutrition and Dietetics in the Department of Nutrition and Health Science. James Stroud, PhD is Professor of Early Childhood, Youth, and Family Studies in the

Department of Elementary Education. Carol Friesen, PhD, RDN, CD is Professor of Nutrition and Dietetics and Graduate Program Director in the Department of Nutrition and Health Science. All are at Ball State University in Muncie, Indiana.