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Scheduling Recess Before Lunch: Perceptions of Washington State Public Elementary School Professionals

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SCHEDULING RECESS BEFORE LUNCH: PERCEPTIONS OF WASHINGTON STATE PUBLIC ELEMENTARY SCHOOL PROFESSIONALS

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ABSTRACT

SCHEDULING RECESS BEFORE LUNCH: PERCEPTIONS OF WASHINGTON STATE PUBLIC ELEMENTARY SCHOOL PROFESSIONALS

Kaitlin O'Leary

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Recess Before Lunch (RBL) is a wellness strategy with a purpose of improving the overall health and behavior of school-aged children. While some studies have reported a variety of benefits and challenges by simply scheduling recess prior to the specified lunchtime, few have examined adequate strategies for successful implementation. This mixed-methods study asked elementary school principals and school food service directors within each K-5th grade public school throughout the state of Washington to participate in an online survey assessing their school's experience using RBL. Schools were placed into three groups based on participants' stage of RBL adoption: (1) currently using RBL, (2) previously used RBL, or (3) have never implemented RBL. Basic demographic information from each school was collected and matched to the survey responses. Participants from the online survey were asked to provide contact information of a school professional closely involved with the lunch services in their school to complete a semi-structured follow-up interview. Eighteen individuals, six in each of the three stages of RBL adoption, participated in a 10-15-minute phone interview to further investigate perceptions related to RBL. Roughly 75.8% of schools reported having some experience with RBL (N = 74). Benefits most often reported were associated with Nutrition & Food Waste, Behavior & Disruption and Scheduling, respectively; whereas the barriers included Scheduling & Staffing, Logistics,

Nutrition & Food Waste and Behavior & Disruption, respectively. However, whether a school reported any benefits had no effect on its history of scheduling the program. A significant correlation was found between student enrollment and a school's experience with RBL. Schools that never implemented RBL had smaller student enrollments ($p < 0.01$) and were significantly more likely to report any barriers ($p < 0.01$), whereas schools currently utilizing the program that had a higher student enrollment ($p < 0.05$) when compared to all other schools. Telephone interviewees reported the significance of gaining support from all involved parties and encouraged finding solutions to challenges prior to implementing the program.

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CHAPTER I

INTRODUCTION

The introduction of healthy eating patterns and physical activity at a young age can decrease a child's risk of developing various health detriments later in life, such as obesity-related diseases, cognitive disparities, psychological problems, and lower academic achievement (Holben, 2010; Taras, 2005; U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). While numerous wellness strategies have been proposed and introduced in various school settings to promote the overall health of students, Recess Before Lunch (RBL), has been rising in popularity due to its minimal cost to implement. RBL, as the name implies, requires a change in the traditional lunch schedule by placing recess prior to a student's lunch period. In theory, the program allows children to participate in physical and social activities prior to eating their lunch, therefore decreasing the pressure or desire to rush through their meal in anticipation of recess. This is believed to result in a less hectic eating environment and increase the overall intake of essential nutrients (Bergman, Buergel, Femrite, & Englund, 2003).

Schools that have implemented RBL have documented increased fruit, vegetable, and overall energy consumption, improved lunch room and classroom behavior, as well as a reduction in plate waste and lunch line wait time (Bergman et al., 2003; Hunsberger, McGinnis, Smith, Beamer, & O'Malley, 2014; Price & Just, 2015; Strohbehn et al., 2016; Tanaka, Richards, Takeuchi, Otani, & Maddock, 2005). Although these studies have shown beneficial aspects of implementing RBL, some of the challenges of implementation may prevent schools from making the change. Logistics in hand washing,

managing outdoor clothing, scheduling, supervising, and possible loss of instructional time, have all been cited as possible or observed barriers to RBL (Bark, Stenberg, Sutherland, & Hayes, 2010; Bounds, Nettles, & Johnson, 2009; Rainville, Wolf, & Carr, 2006). Few studies have examined the RBL implementation process to identify perceived barriers as well as successful strategies.

CHAPTER II

LITERATURE REVIEW

Background

While vitamin and mineral deficiencies in the United States have declined over the past century, the prevalence of chronic obesity-related diseases has been on the rise (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). The most prominent of these largely preventable ailments include cardiovascular disease, Type 2 diabetes, high blood pressure, stroke and certain cancers (National Heart Lung and Blood Institute, 1998; U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). Such obesity-related diseases have been attributed to poor dietary habits, sedentary lifestyle patterns, as well as genetics and race, among other factors (Ogden, Carroll, Fryar, & Flegal, 2015; U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). According to the Centers for Disease Control and Prevention (CDC) in 2013-2014, 37.7% of adults ages 20 years and older and 17.2% of children ages 2-19 years were considered obese (Ogden et al., 2015). This was a 7.2% and 3.3% increase, respectively, from their data collected in 1999-2000 (Ogden et al., 2015). Obesity in adults is defined as a body mass index (BMI) greater than or equal to 30 kg/m^2 (Ogden & Flegal, 2010). However, obesity in children is based on a BMI comparison to a sex- and age-specific reference population. Children whose BMI-for-age falls between the 85^{th} and 95^{th} percentiles-for-age are deemed to be overweight, while obesity is considered at or above the 95^{th} percentile-for-age (Ogden & Flegal, 2010).

Studies have additionally identified a correlation between a higher BMI and food insecurity, defined as the restricted intake of food due to insufficient resources or limited access to nutrient dense foods (Cheung et al., 2015; Jyoti, Frongillo, & Jones, 2005). The inadequate consumption of nutrients in children, specifically, has been correlated with adverse health and growth outcomes, decreased cognitive function, lower academic achievement, behavior problems, and psychological issues (Holben, 2010; Taras, 2005). However, strong evidence has indicated that the development of healthy eating patterns and regular physical activity can help to reduce such detriments; especially if they are introduced at a young age (U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). Due to the amount of time many children spend in or around a school setting, the introduction of innovative school wellness and prevention strategies may be one high-impact, low-cost technique to promote beneficial lifelong behaviors including a healthy weight status and overall improved health and wellbeing.

National School Lunch and Breakfast Programs

Various wellness strategies, as well as improved diet and nutrition plans, have been incorporated within school districts across the country in an effort to promote healthy lifestyle patterns and behaviors early in childhood. The first to lead in these efforts was the U.S. Department of Agriculture (USDA), who in 1946 created the National School Lunch Program (NSLP) to encourage healthy eating behaviors within school lunch rooms. The NSLP was created to help school-aged children meet their daily nutrition requirements by providing healthy low-cost or free school lunches. Schools received cash subsidies and foods from the USDA if the federal requirements were met.

In order to be eligible for free or reduced-priced meals, the student's family must have an income at or below 130 percent of the poverty level or between 130 percent and 185 percent of the poverty level, respectively (Rowe, 2015). In 1975, the School Breakfast Program (SBP) was permanently sanctioned with similar aims as the NSLP, to provide school breakfasts that meet the latest nutritional standards for children. As of March 2017, the NSLP and SBP serve over 30.4 million and 14.8 million students each day, respectively (FNS, 2015).

A National Health and Nutrition Examination Survey (NHANES) examined the dietary quality of children associated with federal food assistance programs across the United States from 1999 to 2012 (Gu & Tucker, 2017). This was assessed using the validated Healthy Eating Index (HEI) across four programs supported by the USDA, including the NSLP and SBP, the Supplemental Nutrition Assistance Program (SNAP), and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Although mean HEI scores for children ages 5-18 years increased over the 13-year data set, participants in the NSLP and SBP had significantly lower scores than non-participants ($p = 0.003$). The researchers believed that while school meals are required to meet federal nutrition standards, the meals a child consumes outside of the school setting are not regulated, and therefore likely influenced the lower HEI scores observed (Gu & Tucker, 2017).

Au, Rosen, Fenton, Hecht, and Ritchie (2016), however, found opposing results. The researchers compared the overall diet quality of fourth and fifth grade students consuming NSLP and/or SBP to individuals bringing lunch from home through diary assisted 24-hour recalls and the HEI-2010. All diary assisted 24-hour recalls were

collected with the assistance of trained interviewers. Students who consumed school breakfast had higher total fruit ($p = 0.01$), dairy ($p = 0.007$), and empty calorie scores ($p = 0.01$), while the remainder of the HEI scores between breakfast groups remained insignificant. Yet, the overall diet quality was higher among students who ate school lunch ($p = 0.02$), with higher dairy ($p < 0.0001$) and greens and beans scores ($p = 0.15$). Although consuming school lunch increased the likelihood of a higher quality diet, all students reached only half of the maximum HEI score and insignificant differences were identified in vegetable and whole grain intakes between groups. This suggests that regardless of a student's participation in the NSLP or SBP, students are not reaching their dietary recommendations.

Furthermore, a separate NHANES study conducted in 2005-2006 found that the majority of children, ages 2-18 years, consumed a diet that exceeds their dietary caloric recommendations; most of such calories were from solid fats and/or added sugars (Reedy & Krebs-Smith, 2010; U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010). Dietary habits such as these can lead to inadequacies of nutrients, such as fiber, vitamins D and E, calcium, potassium, and magnesium, as well as vegetables, fruits, whole grains and dairy (Ogata & Hayes, 2014; Smith & Cunningham-Sabo, 2013). The findings from these studies further support the apparent need for additional nutrition-related policy interventions to improve children's overall nutritional status.

As a result, in 2010 Congress passed the Healthy Hunger-Free Kids Act (HHFKA). It mandated the NSLP and SBP to improve the nutritional quality of the meals offered to school-aged children by meeting the 2010 *Dietary Guidelines for Americans*

beginning in the 2012-2013 school year. The improvements for grades K-5, outlined in **Appendix A**, include a limit on the calories based on age group, as well as a reduction in sodium and fat per meal; and an increase in the number of servings of whole grains, fruits and vegetables, along with specific vegetable subgroups, that are to be offered throughout the week (Concannon, 2013; U.S. Department of Agriculture, 2012). Since the integration of the HHFKA, few studies have examined its effectiveness to date.

Schwartz, Henderson, Read, Danna and Ickovics (2015) evaluated the impact of the HHFKA by observing food selection and consumption patterns of elementary and middle school students participating in NSLP pre and post implementation of the new regulations. While the selection of fruits and entrees being offered increased 12% ($p < 0.05$) and 7% ($p < 0.05$) within two years, respectively, the investigators also noted an increase in vegetable and entrée consumption (18% and 12.7%; $p < 0.05$); and perhaps more importantly, total plate waste did not increase. Cohen, Richardson, Parker, Catalano and Rimm (2014) conducted a similar study with K-8th grade students and observed a 23% increase in fruit selection ($p < 0.0001$), but reported an overall increase in entrée and vegetable consumption (15.6% and 16.2%; $p < 0.0001$), parallel to Schwartz's findings. Cohen et al. (2014) also reported a significant decrease in milk selection and consumption (-24.7% and -10.1%; $p < 0.0001$) and speculated this was due to unrelated school district policy change to remove sugar-sweetened milk occurring at the same time of the intervention study. While limited data have been published on plate waste following the changes in the school lunch guidelines, both of these studies did not identify an increase in food waste. However, there was still a concerning amount of fruit and vegetable waste in particular; roughly 40% of fruit and 60%-75% of vegetable waste

was observed (Cohen et al., 2014). Additionally, Niaki, Moore, Chen, and Weber Cullen (2016) noted that plate waste might be correlated with specific age groups. In a study observing eight separate K-5th elementary schools, K-1st grade students wasted a significantly higher percentage of total calories in comparison to grades 2nd-3rd and 4th-5th ($p < 0.05$ and $p < 0.001$, respectively). More surprisingly, when compared to grades 4th-5th alone, K-1st grade students wasted significantly higher amounts of total vegetables, total grains and total proteins ($p < 0.01$). While these findings indicate additional age-appropriate approaches are needed to reduce school lunch plate waste, providing clearer procedures for successful implementation of the new guidelines may also be essential.

One study in particular noted that food service directors found the new requirements to be burdensome in terms of implementation and meeting guidelines (Cornish, Askelson, & Golembiewski, 2016). Cornish et al. administered semi structured phone interviews and online questionnaires to 67 rural food service directors. The researchers evaluated the perceptions of and the perceived reasons for implementing the HHFKA, as well as the difficulty in which they ranked the new requirements. While some respondents reported positive or mixed opinions, the majority reported having negative perceptions including concerns related to reduced portion sizes, increased plate waste and the challenges of incorporating the new requirements due to financial limitations; many also believed that the implementation of the new policy unfairly placed the blame of childhood obesity on school meals (Cornish et al., 2016). Therefore, when planning to incorporate a new wellness strategy, its effect on overall plate waste, the students' consumption of essential nutrients, and components for a successful implementation should be addressed.

School Wellness Programs

Due to the needs seen not only by researchers but also by school professionals, numerous wellness strategies have been proposed and introduced within various school settings. These strategies include but are not limited to: the addition of salad bars, nutrition education classes, eliminating competitive food options and advertising, and/or the incorporation of Farm to School programs.

A review published by Kessler (2016) examined additional interventions that would be easy to implement within the school food-service environment, yet promote healthy eating behaviors. To narrow their article search, these behaviors were defined as a decreased selection of low-nutrient, calorie-dense foods or increased selection of high-nutrient dense food choices, as well as increased selection or consumption of fruits or vegetables. Sixteen studies were identified and then further divided into five categories: fruit slicing, marketing strategies, time-efficiency strategies, modification of choice, and behavior modification. Although the two studies presented on fruit slicing noted an increased consumption of fruit, inconsistent results were observed. Specifically, the first study reported an increased fruit intake when sliced oranges were provided, yet no difference when sliced apples were offered (Swanson, Branscum, & Nakayima, 2009). This suggests that when more than one option is offered, student preference may play a crucial role in their actual intake.

Marketing strategy interventions such as price reductions or "name branding" of vegetables also provided improvements in consumption. A 50% price reduction of fruit, salad, and carrots resulted in a four-fold increase in fruit sales and doubling of carrot sales in high school students ($p < 0.001$ and $p < 0.021$, respectively) (French et al., 1997).

Interventions using attractive names of vegetables in elementary schools had varying results, but were largely effective by increasing selection and/or consumption (Wansink, Just, Payne, & Klinger, 2012). However, it is unknown if utilizing character names for healthier options in middle school or high school populations would provide similar results, and alternatively if price reductions would be effective in elementary schools. A time-efficiency intervention that provided an express cafeteria line for salads/sandwiches, vegetables, fruit, and milk reported an increased selection of healthier foods by 18.8% per student ($p < 0.01$), but not in the amount consumed, leading to an increase in plate waste (Hanks, Just, Smith, & Wansink, 2012). Additionally, of the two incentive-based studies for behavior modification, a six-week token reinforcement approach was noted to have a significant visual increase in the consumption of fruits or vegetables ($p < 0.001$) in first, second and fourth grade students (Hendy, Williams, & Camise, 2005). By eating at least one-eighth cup of fruits or vegetables, students were offered their choice of a small prize at the end of each week, ranging from school supplies such as decorative pencils, gel pens and notebooks or simple age-appropriate toys such as clay, playing cards, and toy gliders. The successful reinforcement for fruits and vegetables continued two weeks post intervention, but the consumption of each returned to baseline after seven months (Hendy et al., 2005).

A similar study by Just and Price (2013) provided elementary students with a range of prizes as an incentive for eating fruits and vegetables. Incentives included $0.05 immediately after consumption, $0.25 immediately after consumption or at the end of two weeks, or finally a lottery ticket for a prize immediately after consumption or at the end of two weeks. The prizes were equivalent to the number of students rewarded with a

token, multiplied by $0.25. The prizes included various recreational items, such as swimming goggles, soccer balls, or tennis rackets. All of the incentives increased the percentage of students consuming at least one serving of fruit and/or vegetables (+27.7%, $p = 0.01$); however, the researchers noted offering $0.25 on the same day, had the greatest impact with a 38.5% increase in serving consumption ($p = 0.01$). It is important to note that most of the behavior modification results, reported by Kessler (2016), did not continue post-intervention. While each of the interventions promoted some form of improved healthy eating behavior, not all approaches were realistic, achievable, or sustainable within all school cafeteria settings due to differences between age groups, or the need for additional physical space, labor or funding (Kessler, 2016). Thus, the need for additional wellness and prevention strategies remains evident.

Recess Before Lunch

Consuming a healthy lunch is an integral part of a student's day for social interactions, to provide essential nutrients, and to enhance academic performance; thus, it is important to promote positive eating behaviors early in childhood that are more likely to persist into adulthood (Baranowski et al., 2000). For decades, elementary schools have traditionally scheduled recess after the students' lunch period to promote physical activity with their peers aside from physical education and classroom settings (Michael & Zavacky, 2017). However, the importance of recess placement (i.e. before or after lunch) has recently come under scrutiny. One plate waste study from two separate elementary schools, examined the impact of recess placement, one with recess before lunch (RBL) and one without (Bergman et al., 2003). It was reported that children with recess after

lunch (RAL) had an average plate waste of 40.1%, compared to an average plate waste of 27.2% from children with RBL (Bergman et al., 2003). Similarly, Getlinger, Laughlin, Bell, Akre and Arjmandi (1996) found an overall decrease in plate waste of 10.6% ($p < 0.05$) when recess was placed prior to lunch in a separate five-week elementary school study. The researchers believed their findings may be correlated with children feeling less rushed to finish their meals with the anticipation of going to recess (Bergman et al., 2003; Getlinger et al., 1996). In addition, Bergman et al. (2003) noted that students with RAL were not reaching the Dietary Guidelines recommended by the Office of Disease Prevention and Health Promotion (ODPHP) for many essential macro- and micronutrients, including calcium, vitamin A, and iron. To prevent these detriments noted by Bergman and colleagues, as well as the limited intake of fiber, vitamin D and E, potassium, and magnesium as previously mentioned, a need for a new approach was noted. RBL is one school wellness strategy that has been rising in popularity due to the observed effectiveness of intake and its minimal cost to implement.

RBL, as the name implies, changes the traditional lunch schedule by placing recess prior to a student's lunch period. In theory, by allowing students to partake in physical as well as social activity before eating lunch, there is less pressure or desire to rush through their meal, increasing the overall intake of essential nutrients (Bergman et al., 2003). The creation of a less hectic eating environment and the promotion of more positive eating behaviors has the potential to improve the overall health and behavior of school-aged children.

Benefits of Recess Before Lunch

Schools that have implemented RBL have documented increased energy and nutrient consumption, improved lunchroom and classroom behavior, decreased plate waste, and reduced lunch line wait time (Bergman et al., 2003; Price & Just, 2015; Tanaka et al., 2005). In the previously discussed intervention reported by Bergman et al. (2003), children with RBL had an overall increased consumption of total calories and all macronutrients including saturated fat in relation to the percentage offered ($p < 0.0001$). The researchers also observed a significant increase in mean consumption of calcium, iron ($p < 0.0001$) and vitamin A ($p < 0.001$) for students with RBL, and a higher vitamin C consumption in schools with RAL ($p < 0.0001$). In a separate plate waste study, 3rd grade students within three separate school districts were observed (Strohbehn et al., 2016). Assessments were made twice with RAL and twice with RBL within all schools. For each consecutive visit, the same entrée menu was offered, with the exception in variations of the fruits and vegetables. When compared to RAL, students with RBL were reported to have a reduced visual and weighed plate waste for meat/meat alternative, grains, and fruit (no absolute data provided), indicating a higher intake of these food items. While both plate waste measurements with RBL noted increased milk waste indicative of decreased consumption, dissimilarities in waste were observed between all schools (Strohbehn et al., 2016). The researchers hypothesized that variable NSLP participation and a milk promotion campaign within one school might explain this observation.

Furthermore, through an observational plate waste study among seven elementary schools, Just and Price (2015) reported a 45% increase of at least one serving of fruits

and vegetables eaten when three of the schools moved recess prior to lunch ($p = 0.001$). The total servings of fruits and vegetables consumed also increased by 54% ($p = 0.001$) (Price & Just, 2015). Hunsberger et al. (2014) additionally observed a single K-2nd elementary school over five non-consecutive days. Researchers evenly divided 15 classes across all grade levels into either recess before or after lunch. While changes in median plate waste percentages of total calories, protein, vitamins C and A, and iron were insignificant between days, students with RBL were, on average, 1.5 times more likely to meet their calcium ($\geq$ 267mg, $p = 0.01$) and total fat ($\leq$ 30% total calories, $p = 0.02$) recommendations compared to students with RAL (Hunsberger et al., 2014). Although students with RBL were 17% more likely to drink an entire carton of milk ($p < 0.0001$), the variation in fruit and vegetable consumption was believed to be due in part to individual acceptability and preference (Hunsberger et al., 2014). The variation in these findings indicates the apparent need for additional approaches to successfully implement RBL.

In addition to the few studies that observed reductions in plate waste after implementation of RBL, improvements in student behavior has also been recorded (Bark et al., 2010; Hunsberger et al., 2014; Tanaka et al., 2005). Various school professionals have provided positive feedback through open-ended qualitative or closed-ended surveys on the changes of student behavior, stating there were fewer disciplinary problems on the playground and in afternoon classes after the implementation of RBL (Bark et al., 2010; Hunsberger et al., 2014; Tanaka et al., 2005). One school in particular noted that four weeks after RBL was introduced, discipline referrals of students decreased from 14 to

zero each week, and accounted for only 0.03% of the total referrals by the end of the year (Tanaka et al., 2005).

Tanaka et al. (2005) additionally reported that RBL resulted in a nearly two-minute reduction ($p < 0.05$) in lunch line wait time due to varied student entry into the cafeteria from the playground. Teachers and educational aides reported that the staggered entrance times into the cafeteria, resulted in smaller, more manageable groups of students at recess and in the lunchroom; allowing for a more relaxed environment (Hunsberger et al., 2014; Tanaka et al., 2005). Students with RBL additionally appeared to return to the classroom after lunch less stimulated, ready to learn, and have improved focus throughout the afternoon (Hunsberger et al., 2014; Tanaka et al., 2005). So while various benefits of RBL have been observed, the most recently published data from 2001 by the School Health Policies and Programs Study reported only 4.6% of schools had implemented the program nationwide (Wechsler, Brener, Kuester, & Miller, 2001). Some of the challenges related to the implementation process may provide an explanation as to why.

Perceived Barriers of Recess Before Lunch

Although clear benefits of RBL have been reported, barriers to implementation have also been observed. Specifically, while some studies have seen insignificant differences in plate waste between RBL and RAL (Tanaka et al., 2005), others have shown varying outcomes in the percentages of food items wasted. Strohbehn et al. (2016) observed an increased weight of milk and vegetable waste for students with RBL, indicating a lower consumption of such items (no absolute data provided). However, Hunsberger et al. (2014) reported that even though students with RBL were 1.5 times

more likely to meet their nutritional needs for calcium through milk consumption (p = 0.01), no significant differences in fruit and vegetable intake were seen between groups. The differing results of these plate waste studies suggest that students may continue to consume items they are familiar with or prefer, regardless of the placement of recess with lunch (Hunsberger et al., 2014; Strohbehn et al., 2016).

Although the data previously presented by Tanaka et al. (2005) reported that teachers and educational aides perceived the two-minute reduction in lunch line wait time to be a benefit, the researchers believed RBL would potentially decrease the amount of time allowed for students to eat lunch due to slow entry into the lunchroom. In a separate study, educational aides reported a concern in regards to slow eaters, stating that when lunch is first, these students are able to spend more time eating and less time at recess; an option that RBL would not be able to accommodate (Hunsberger et al., 2014). Gray et al. (2016) aimed to further evaluate the effect of RBL on social behavior, physical activity, and readiness to learn in the classroom. In contrast to previous research, they reported no significant difference in playtime minutes or social behavior during recess, regardless of recess placement. Additionally, according to the Survey of Readiness, Engagement and Disruption in Youth (SOREADY) that was completed by the teachers involved, students with RAL were reported to have better behavioral engagement within the classroom (p = 0.012) in contradiction to the studies by Tanaka (2005), Bark (2010), and Hunsberger (2014) (Gray et al., 2016). Challenges with slow eaters and behavioral issues are areas in need of further observations.

Logistical challenges related to the implementation process have also been an area of concern. Aside from the resistance to a change in scheduling, a resistance to the

change of tradition in lunch and recess placement was also noted from the individuals directly involved with the process of implementation (Bark et al., 2010; Rainville et al., 2006). Some individuals believed that it was unnecessary to change the traditional schedule that has been carried out for a long period of time (Rainville et al., 2006). Other reported logistical barriers to RBL include: managing hand washing, the handling of outdoor clothing, maintaining adequate supervision, and potentially losing instructional time due to the scheduling change (Bark et al., 2010; Bounds et al., 2009; Rainville et al., 2006). While an argument can be made either for or against the use of RBL, a strong and organized approach should be taken into consideration for a successful implementation.

Strategies for Successful Implementation of Recess Before Lunch

Since both strengths and weaknesses of RBL have been observed, it is apparent that creating a welcoming, positive environment for successful implementation may be a crucial factor. In a study conducted by Bounds et al. (2009), four-point Likert-type scale surveys were distributed among school nutrition directors, elementary school administrators, and elementary teachers within 700 public school districts. Participants were asked to rank 27 issues related to scheduling of RBL and 33 issues related to the successful implementation of RBL. The participants reported that when scheduling RBL, the most important factors to consider were related to: student feeding implications (3.42 ± 0.54); RBL's influence on student behavior in the classroom and cafeteria (3.34 ± 0.64); scheduling (3.08 ± 0.63); personnel support and associated workload (2.83 ± 0.65); and logistics in hand-washing and managing outdoor clothing and sack lunches (2.62 ± 0.70). However, when assessing aspects to consider for a successful implementation of

RBL, having strong leadership roles, the collaboration of all involved parties, and flexibility in regards to a new schedule was rated among the top factors (3.53 ± 0.64, 3.48 ± 0.68, and 3.42 ± 0.64, respectively). Conversely, concern for storing students' personal belongings (2.36 ± 0.89) and the assessment of program costs (2.81 ± 0.88) were rated the two least important factors (Bounds et al., 2009). These findings provide beneficial insight towards how to successfully implement RBL.

A similar study examined the opinions of elementary and middle school principals (K-8th) on factors associated with effective implementation of RBL as well as the benefits and challenges associated with RBL (Bark et al., 2010). A closed and open-ended question survey branched participants into three target groups (those currently using RBL, those who previously used RBL, and those who never used RBL). Of the principals currently using RBL, 90% reported strong leadership from the administration, support from school staff, and effective cooperation among school personnel to be the top priorities for successful implementation; concurrent with the results noted from Bounds et al. (2009). Of note, regardless of the obstacles that ultimately reverted principals back to RAL (including revisions of the daily schedule and logistics of hand washing, among the top reasons), 68% reported that they would consider implementing it again in the future due to the various positive outcomes that had also been observed (Bark et al., 2010). The results of these studies suggest that implementing RBL may require a well-rounded, team-oriented approach to be successful.

Conclusion and Study Objectives

Research examining the implementation process of RBL is limited. Although some studies have reported both the benefits and barriers associated with implementing the program, only two have assessed strategies for a successful implementation. Therefore, the objective of this study is to identify the correlations of a public elementary schools' (K-5th grade) demographic characteristics and RBL experience in the state of Washington. Quantitative surveys will be emailed to elementary school principals and nutrition school food service directors within each K-5th grade public school throughout the state of Washington. The online surveys will assess their school's history of using RBL and place the school into three separate groups: (1) currently using RBL, (2) previously used RBL, or (3) have never implemented RBL.

This study also explores the perceptions of public school food service directors, counselors, teachers, and principals on the benefits, barriers and challenges related to RBL. Participants from the online survey will be asked to provide contact information of a school professional closely involved with the lunch or nutrition services in their school to complete a semi-structured follow-up interview. Professionals within each subgroup previously defined, will participate in a 10-15-minute phone interview to further investigate perceptions related to RBL. The ultimate aim of this mixed-model descriptive study is to identify tools to further assist schools in the implementation of RBL.

CHAPTER III

JOURNAL ARTICLE

RETHINKING RECESS: PERCEPTIONS OF SCHOOL PROFESSIONALS ON THE RECESS BEFORE LUNCH PROGRAM

Rethinking Recess: Perceptions of School Professionals on the Recess Before Lunch Program

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ABSTRACT

Purpose/ Objectives

This study explores the perceptions of elementary school (K-5th) professionals on the benefits and barriers of the school wellness strategy, Recess Before Lunch (RBL) and the best practices to successfully implement the program.

Methods

This mixed-methods study asked Washington State public elementary school principals and food service directors to participate in an online survey assessing their school's experience using RBL. Schools were placed into three groups based on participants' stage of RBL adoption: (1) currently, (2) previously, or (3) have never implemented RBL. Basic demographic information from each school was collected and matched to the survey responses. Participants provided contact information of school professionals closely involved with the nutrition services in their school to complete a follow-up interview. Eighteen individuals, six in each stage of RBL adoption, participated in a 10-15-minute phone interview to further investigate perceptions related to RBL.

Results

Roughly 75.8% of schools reported having some experience with RBL (N = 74). Benefits most often reported were associated with Nutrition & Food Waste, Behavior & Disruption and Scheduling, respectively; whereas the barriers included Scheduling & Staffing, Logistics, Nutrition & Food Waste and Behavior & Disruption, respectively. However, whether a school reported any benefits had no effect on its history of scheduling the program. Schools that never implemented RBL had smaller student

enrollments ($p < 0.01$) and were more likely to report any barriers ($p < 0.01$), whereas schools currently utilizing the program that had a higher student enrollment ($p < 0.05$) when compared to all other schools. Telephone interviewees reported the significance of gaining support from all involved parties and encouraged finding solutions to challenges prior to implementation to create a sustainable program.

Applications to Child Nutrition Professionals

Quantitative and qualitative results from this study provide useful information for child nutrition professionals to successfully implement RBL.

Keywords: Recess Before Lunch, schools, wellness programs

INTRODUCTION

The introduction of healthy eating patterns and physical activity at a young age may decrease a child's risk of developing various health-related detriments later in life, such as obesity-related diseases, cognitive disparities, psychological problems, and lower academic achievement (Holben, 2010; Taras, 2005; U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2015). As a result, the United States Department of Agriculture (USDA) has led efforts across the US to promote the health and wellbeing of children.

Since the introduction of the National School Lunch Program (NSLP) and School Breakfast Program (SBP) in 1946 and 1975, respectively, studies have shown varied results in the diet quality of students who participate compared to students who did not participate. Ultimately, both groups were unable to meet many of their recommended dietary allowances (Au, Rosen, Fenton, Hecht, & Ritchie, 2016; Gu & Tucker, 2017). Consequently, Congress passed the Healthy Hunger-Free Kids Act (HHFKA) in 2010, mandating that the NSLP and SBP were to provide meals to students that met the 2010 Dietary Guidelines for Americans beginning in the 2012-2013 school year. While the results from studies observing the HHFKA's effectiveness of increasing nutrient consumption in students have also varied, a concerning amount of food waste was noted (Cohen et al., 2014; Schwartz et al., 2015); indicating that additional approaches to promote the consumption of essential nutrients is needed.

Numerous wellness strategies have been introduced in various school settings aiming to promote the health of students with varying success. One in particular, Recess Before Lunch (RBL), has been rising in popularity due to its minimal cost to implement.

RBL, as the name implies, requires a change in the traditional lunch schedule by placing recess prior to a student's lunch period. In theory, by scheduling RBL, children participate in physical and social activities prior to eating their lunch, thereby decreasing the pressure or desire to rush through their meal in anticipation of recess. This is believed to result in a less hectic eating environment and increase the overall intake of essential nutrients (Bergman et al., 2003; Getlinger et al., 1996).

Schools that have implemented RBL have documented increased fruit, vegetable, and overall energy consumption, improved lunch room and classroom behavior, as well as a reduction in plate waste and lunch line wait time (Bergman et al., 2003; Hunsberger et al., 2014; Price & Just, 2015; Strohbehn et al., 2016; Tanaka et al., 2005). Although these studies have shown beneficial aspects of implementing RBL, some of the challenges of implementation may prevent schools from making the change. Logistics in hand washing, managing outdoor clothing, scheduling, supervising, and possible loss of instructional time, have all been cited as possible or observed barriers to RBL (Bark et al., 2010; Bounds et al., 2009; Rainville et al., 2006). Schools that faced initial obstacles, such as logistical issues and revisions to the school schedule, later reported positive results from RBL and found that the long-term benefits, as described above, outweigh the challenges of the implementation process (Bark et al., 2010). Regardless of the proposed benefits of RBL, the majority of schools have not introduced this change, the reasons being likely related to the challenges of initial implementation.

Few studies have examined the RBL implementation process to identify perceived barriers and successful strategies. Thus, the primary objective of this study is to identify correlations associated with public elementary schools' (K-5th grade) demographic

characteristics and RBL experience in the state of Washington. The study also explores the perceptions of various public school professionals on the benefits, barriers and challenges related to the RBL implementation process. The results of this study will identify tools to further assist schools in successfully implementing RBL.

METHODOLOGY

This mixed-methods study explored the perceptions of elementary school professionals on the benefits and barriers of RBL, as well as approaches used to successfully implement the program. The quantitative phase consisted of an online questionnaire administered to Washington State public elementary school principals and food service directors. The qualitative phase consisted of semi-structured telephone interviews with various school professionals identified in the online survey. Central Washington University's (CWU) Human Subjects Review Committee approved all data collection and analysis protocols prior to study initiation.

Quantitative Phase

Study Participants

Public elementary school principals (N = 434) and food service directors (N = 140) throughout the state of Washington were invited to participate in an online quantitative survey. Contact information for the elementary school principals and food service directors was obtained through the State of Washington's Office of Superintendent of Public Instruction (OSPI) website and the Washington School Nutrition Association (WSNA), respectively. Principals and food service directors were asked to complete an online survey (Qualtrics, 2017) assessing their school's experience

using RBL which then helped investigators categorize the schools into three subgroups of RBL adoption: (1) currently using RBL, (2) previously used RBL, or (3) have never implemented RBL.

Basic demographic information about each respondent's school was obtained using the State of Washington's OSPI website. This included student enrollment in each school, general student racial/ethnic distribution, the number of students receiving free- or reduced-lunch, and whether the school is categorized as rural or urban. Rural schools are defined as having a population density less than 100 persons per square mile within the county they are located (State of Washington Superintendent of Public Instruction, 2017). This school-level data was then later matched to participants' survey responses to provide a more descriptive analysis.

Data Collection

Three rounds of emails were sent during the winter of 2017 to each of the specified groups to anonymously complete the survey. The survey included six possible questions and took approximately five minutes to complete. The survey began by asking the individuals to identify their school, followed by a question on RBL adoption. If the participant identified a history of using RBL, they were then asked if the school is currently still using RBL or has switched back to the traditional schedule. All participants were additionally asked to identify their perceived benefits and barriers of implementing RBL regardless of their school's history. To conclude the survey, each respondent was asked to provide contact information of an individual closely involved with the school food service program in order to complete a follow-up qualitative telephone interview based on their experience with RBL.

Qualitative Phase

Study Participants

Respondents who were identified in the online survey were contacted for a telephone interview to obtain additional qualitative data regarding the perceived benefits and barriers to implementation of RBL. The school professionals included teachers, elementary school principals and assistant principals, school counselors and nurses, and school cafeteria/lunchroom workers. The online questionnaire categorized the schools into whether they are currently using RBL, have previously used RBL, or have never implemented RBL. This determined the series of questions administered in a semi-structured follow-up telephone interview. Within each subgroup, a minimum of six subjects was recruited (N = 18) unless additional subjects were deemed necessary to achieve saturation (Green & Thorogood, 2009).

Data Collection

Through purposeful selection to meet maximum variation, participants were chosen based on their school's experience with RBL, their professional occupation within the school setting, and the scale of student enrollment within their school (i.e. enrollment above 500 students versus below 500 students). The interviews took approximately 10 - 15 minutes to explore perceptions on RBL based on their previous experience with the program, if any, or their perceived barriers around the implementation of RBL. All participants were briefed on the interview process and informed that responses would be recorded and transcribed for accuracy. Participants were asked to identify their professional positions and the schools that they represented. Individuals from schools with a history of using RBL, previously or currently, received a branch of questions

related to the following: 1) length of time utilizing RBL; 2) grade levels involved in RBL; 3) observed benefits; 4) observed challenges and facilitative factors; 5) their advice for other schools that may consider implementing RBL; 6) if they have reverted back to a traditional lunch schedule, and why; and 7) any resistance from the school board or issues related to revising the daily school schedule. Individuals representing schools that have never used the program were asked a different branch of questions related to: 1) their intentions, if any, of implementing RBL and 2) any perceived benefits or barriers of implementing RBL. All participants in this phase were entered into a raffle to win one of five $20 gift certificates as compensation for their time and assistance with the study.

Data Analysis

Quantitative Phase

Similar themes reported from Bark et al. (2010) and Bounds et al. (2009) on the benefits and barriers of RBL were derived from the content provided in the online surveys and associated codes were developed. Descriptive and inferential statistical analysis was conducted using STATA, Version 11 (StataCorp, 2009) for basic demographic characteristics of each elementary school. Chi-squared tests of proportions and unpaired *t* tests were conducted to identify characteristics that correlated with the implementation of RBL and the perceived benefits or challenges associated with RBL.

Qualitative Phase

A team of two student co-investigators and the primary investigator transcribed the audio files from the telephone interviews. Transcripts were analyzed using thematic content analysis until a consensus on key themes were achieved. Husserl's and

Heidegger's interpretive bracketing approach was applied throughout this process to account for investigator perceptions (Fischer, 2009). The qualitative and quantitative results were triangulated to provide further understanding of the participants perceived benefits and barriers of RBL.

RESULTS AND DISCUSSION

Quantitative Phase

Eighty-eight elementary school principals and 47 school food service directors completed the online questionnaires for a response rate of 20.3% and 33.6%, respectively (N = 135). Exclusion criteria for the online survey included: responses without a school name listed; or responses with limited information to determine the actual school and district (i.e. there are several schools within the state of Washington with the same name). After inclusion criteria were met, 99 participants were included in the analysis, 82 principals and 17 school food service directors, for a total response rate of 17.2%. The findings illustrate that among the schools who responded, roughly 50.5% of schools currently utilize RBL and approximately 75% of schools had some experience with RBL, currently or previously, within the state of Washington (**Table 1**). Prior to this study, Wechsler et al. (2001) reported that only 4.1% of schools nationwide had fully adopted the program and 18.4% had some experience with RBL. More recently, Bark et al. (2010) identified that 55% of respondents within the state of Montana indicated having experience with RBL. The growing body of evidence supporting the many benefits for school-aged children that are associated with changing the lunch schedule may explain

the reasoning behind this increased prevalence (Bergman, Buergel, Joseph, & Sanchez, 2000; Getlinger et al., 1996; Tanaka et al., 2005).

Table 1: Implementation of RBL by School Characteristics

	Current RBL	Previous RBL	Never RBL
Participants	*N* = 50	*N* = 25	*N* = 24
Average School Enrollment	503 *	481	400 **
Rural Schools [a]	14	8	12 *
Average Number of Students Receiving Free or Reduced Lunches	225 (44.6%)	212 (44.01%)	210 (52.4%)
Average Minority Enrollment [b]	226	184	146

**p<0.05 and **p<0.01; Two-sample t test indicated a significant correlation compared to all of the other respondents.*

[a] *Rural schools are defined as being located within counties that a have a population density less than 100 persons per square mile;* [b] *Minorities are defined as the group of individual who identify themselves as Hispanic/Latino of any race, American Indian/Alaskan Native, Asian, Black/African American, Native Hawaiian/Other Pacific Islander, or Two or More Races.*

Few, if any, studies have analyzed the various covariates of a school's demographic characteristics with its history of scheduling RBL. The current study observed a higher proportion of schools without a history of scheduling RBL having a significantly smaller student enrollment ($p < 0.01$). They were additionally more likely to report any barriers ($p < 0.01$) with the largest barrier related to Scheduling & Staffing ($p < 0.05$). However, the likelihood of a school reporting benefits associated to the schedule change had no significant correlation to its history of RBL. The study's descriptive characteristics and findings and are outlined in **Tables 1 & 2**.

Table 2: Summary of Sample Characteristics and Perceptions of RBL

	Total Respondents
Participants	*N* = 99
Average School Enrollment	473
Rural Schools [a]	34
Average Number of Students Receiving Free or Reduced Lunches	219 (46.4%)
Average Minority Enrollment [b]	197
Perceived Benefits to RBL [c]	85 (85.9%)
Nutrition & Food Waste [d]	71 (71.7%)
Hungrier/ Eat more/ Less food waste	49 (49.5%)
No rush to eat/ More focused on eating	46 (46.5%)
Eat Healthier	7 (7.1%)
Better digestion/ Less stomach aches	6 (6.1%)
Drink more liquids	2 (2.0%)
Behavior & Disruption [d]	25 (25.3%)
Calmer/ Better behavior in cafeteria or classroom	19 (19.2%)
Less class interruption or discipline issues	12 (12.1%)
Increased academic time	2 (2.0%)
Scheduling & Staffing [d]	23 (23.2%)
Wind down time before class	9 (9.1%)
Scheduling	8 (8.1%)
Ability to stagger lunch lines	4 (4.0%)
Less teacher management	3 (3.0%)
No Perceived Benefits	14 (14.1%)
Perceived Barriers to RBL [c]	80 (80.8%)
Scheduling & Staffing [d]	60 (60.6%)
Scheduling	47 (47.5%)
Staffing/ Hard to supervise	22 (22.2%)
Convincing staff/ Change in tradition	7 (7.1%)

Logistics [d]	30 (30.3%)
Hand – washing	16 (16.2%)
Transition time before eating	10 (10.1%)
Physical barriers/ Not enough room	5 (5.1%)
Weather permitting	2 (2.0%)
No time to clean	2 (2.0%)
ID Cards	1 (1.0%)
Nutrition & Food Waste [d]	16 (16.2%)
Not Finishing Lunch/ Not enough time	13 (13.1%)
Low energy in afternoon/ Increased sickness	3 (3.0%)
Too hungry	2 (2.0%)
Behavior & Disruption [d]	11 (11.1%)
Behavior Issues in lunchroom or class-room	10 (10.1%)
Late to class	2 (2.0%)
No Perceived Barriers	12 (12.1%)

[a]Rural schools are defined as being located within counties that a have a population density less than 100 persons per square mile; [b]Minorities are defined as the group of individual who identify themselves as Hispanic/Latino of any race, American Indian/ Alaskan Native, Asian, Black/ African American, Native Hawaiian/ Other Pacific Islander, or Two or More Races; [c]Total number of respondents that reported any perceived or observed benefits or barriers associated with RBL; [d]Total number of respondents that reported perceived or observed benefits or barriers associated with RBL within the specified groups.

Benefits and Barriers

Thematic analysis revealed 13 themes associated with benefits and 15 themes associated with barriers of RBL from the perspective of public elementary school principals and food service directors. The various perceived and observed themes were similar to those recognized in previous research (Bark et al., 2010; Bounds et al., 2009; Rainville et al., 2006). An average of 85.9% and 80.8% of respondents reported various benefits and barriers associated with RBL, respectively. Similar to the response ratings found by Bark et al. (2010), benefits were reported more often in schools currently

utilizing RBL (92%) and schools that have never (100%) or no longer (80%) use RBL reported a higher percentage of challenges. Beneficial factors associated to Nutrition & Food Waste were reported most often (71.7%), followed by Behavior & Disruption (25.3%) and Scheduling (23.2%). However, barriers that were most often reported were also associated with Scheduling & Staffing (60.6%), followed by various Logistical barriers (30.3%), Nutrition & Food Waste (16.2%) and Behavior & Disruption (11.1%). Bark et al. (2010) identified comparable results noting that all schools reported a higher percentage of benefits related to increased student consumption of lunches. It was additionally noted in that study that revision of the daily school schedule was among the biggest challenges; suggesting this may need to be an initial area of focus when considering implementing a change to a RBL schedule.

Student Enrollment

Schools with higher student enrollment had a significantly higher prevalence of currently utilizing RBL ($p < 0.05$) and reporting benefits associated with Behavior & Disruption ($p < 0.05$). While schools with a lower student enrollment were more likely to report no experience with RBL ($p < 0.01$) and have a higher occurrence of reporting any barriers associated with RBL ($p < 0.05$). In a study conducted within the state of Montana, 36% of schools currently using RBL reported school enrollments between 251 – 400 students (Bark et al., 2010). Although it is likely that the overall makeup of Washington schools varies from those located in Montana, respondents in the current study with RBL had an average school enrollment of 503 students. One respondent indicated that smaller schools, when compared to larger schools, may have a more

difficult time with transitioning to a RBL schedule due to the various challenges reported and is likely a result of fewer staff and resources.

"Unfortunately, it comes down to school design. We don't have a facility – without hiring additional staff – to take children to a different part of the building [to wash their hands]."

Rural vs. Urban

Schools that were categorized as rural had a slight, but non-significant, association to never have implemented RBL but had a higher prevalence of reporting any perceived barriers to RBL implementation ($p < 0.10$). Previous studies have not taken this variable into account and thus it is difficult to hypothesize as to why this may be relevant; however, rural schools tend to have a smaller student population, a factor that was identified with a decreased likelihood of having implemented a RBL schedule.

Free and Reduced-Cost Lunches

Of the schools that were more likely to report benefits associated with Nutrition & Food Waste and Behavior & Disruptions, there was an average of 14.7 ± 5.7% and 14.7 ± 5.9% fewer students receiving free or reduced-cost lunches, respectively ($p < 0.05$). It is theorized that this may be associated with fewer students waiting in the lunch line resulting in additional time for them to eat their lunch.

"[It's a] challenge finding a way that all the kids don't hit the lunchroom at the same time and have to stand in line as long."

"There is always the issue of getting the kids their trays and food fast enough, or having enough time for them to eat."

However, among the schools that had higher reporting of barriers associated with Scheduling & Staffing, there was an average of 10.5 ± 5.3% more students receiving free or reduced-cost lunches (p = 0.05). By having more students participating in the NSLP, organizational issues and the need for additional staffing as students return to the lunchroom after recess may arise.

> *"When the [students] come in from the playground, you're trying to put them into lunch lines in an organized way. That adds labor [but] the teachers are on their lunch break so you lose that teacher supervision."*

The need for more supervision in the lunchroom has been noted in previous research as well (Hunsberger et al., 2014) and may present a significant barrier that needs to addressed. Lastly, the percentage of students receiving free- or reduced-cost lunches had an insignificant effect on the occurrence of schools reporting experience with RBL.

Minority Enrollment

The racial distribution of schools had no association with the likelihood of implementing the RBL program.

Qualitative Phase

Saturation was achieved after 18 telephone interviews were conducted indicating the sample size was large enough and further data collection was not needed. Participants included principals (N= 4), assistant principals (N = 3), school food service directors (N = 4), deans of students (N = 3), school counselors (N = 2), a nurse (N = 1), and a teacher (N = 1). Themes similar to those categorized from the quantitative phase were also observed in the follow-up telephone interview qualitative phase. The results from this study were

consistent with previous research evaluating the benefits and barriers associated with RBL (Bark et al., 2010; Tanaka et al., 2005) as well as the recommendations identified for successful implementation and decreased resistance related to implementation of RBL (Bounds et al., 2009; Rainville et al., 2006).

Benefits and Barriers

Responses associated with the various benefits and challenges of RBL are outlined in **Table 3**. An infrequent advantage of scheduling recess before the traditional lunch period included blood glucose management for students diagnosed with diabetes. Additional uncommon themes that arose involved the increased risk of injury at recess from low energy stores and the added cost to change the schedule due to the need for additional staffing or antibacterial hand sanitizer for the children to use upon returning to the lunchroom.

Table 3: Qualitative Themes on the Perceived Benefits and Barriers Associated with RBL as Reported by School Professionals

Themes	Examples
Benefits	
Nutrition & Food Waste	
No rush to eat/ More focused on eating	*"Children come in and pay attention to their lunch, talk with their friends and aren't in a hurry to get outside [with RBL]. They focus more on the food in front of them."*
Better digestion/ Less stomach aches	*"[With RAL] when students tell the nurse they have a headache or they don't feel very good, it's because they haven't eaten enough or they're not getting enough fluids."*
	"Less stomach aches by going to recess first and then eating - rather than eating and then going out and running."
Eat Healthier	*"Without the distraction of going out to play, the students have better eating habits… they eat better [with RBL]."*
Hungrier/ Eat more/ Less food waste	*"They come in hungrier [after recess]. They are more apt to eat their lunch"*
Drink more liquids	*"… [the kids] definitely drank more [with RBL] - they definitely drank more milk because they were thirsty."*
Behavior & Disruption	

Less class interruption or discipline issues	*"[With RAL] they're still heightened in their emotions, especially if things have gone badly at recess – like a conflict."*
Increased academic time	*"We think that it would be better for them in their classes after lunch if they would do recess then lunch… because [with RAL] they are very wound up and that sort of thing so we just think that [RBL] would help in the classroom setting."*
Calmer / Better behavior in cafeteria or classroom	*"We believe the behavior of the students would be better [with RBL]… they would be calmer and more ready to consume their lunch."*
Scheduling & Staffing	
Ability to stagger lunch lines	*"[RBL] helps us stagger the 534 kids in a lunchroom that only hold 250 kids, we can't put them all in at once.*
Wind down time before class	*"It was more of a gradual transition of going out to recess and then to lunch. Instead of eating lunch, playing hard at recess and then having them come back to the classroom and expecting them to be calm right away."*
Scheduling	*"They do RBL because that is what works best with their schedule."*
Less teacher management	*"With [RAL] teachers take the kids down to the lunchroom and stand in line versus taking them outside."*
No Perceived Barriers	*"Challenges were so great [with RBL], there was really never an opportunity to see the benefits."*
Barriers	
Nutrition & Food Waste	
Not Finishing Lunch / Not enough time	*"[With RBL] we had the issue of what happens if they're still eating when the teacher comes to pick them up."*
Too hungry	*"...our school starts at 8am so by the time 11 rolls around, [with RBL] the kids are very hungry."*
Low energy in afternoon / Increased sickness	*"If they come in… after burning a bunch of energy [at recess] and eat a heavy meal, the issue is that they're going to be falling asleep in class."*
Behavior & Disruption	
Late to class	*"My biggest challenge with [RBL] is those kids who are slow eaters. When lunch is over, it's over. It's not like that they can just weed into their recess time, instead they weed into their class time."*
Behavior Issues in lunchroom or classroom	*"[With RBL] kids are a little more wild coming out of the lunchroom because they've been sitting bored if they finished their lunches fast. So they are actually a bit more ramped up than if they came in off the playground."*
Scheduling & Staffing	
Convincing staff / Change in tradition	*"There also seems to be push-back from the teachers [for RBL]"*
Scheduling	*"Scheduling and contractual requirements with teachers and their prep times are the biggest issues [with RBL]."*
Staffing / Hard to supervise	*"[RBL] adds labor because now your bringing the kids back into the building and trying to organize them into lunch lines."*
Logistics	
Physical barriers / Not enough room	*"It's space more than anything [for RBL]… making sure you have the square footage for a big enough lunch room."*
	"We don't have a direct pass from the lunchroom to the playground… so that makes [RBL] a little bit challenging for us."
ID Cards	*"A cashier has to either enter their student ID number and look up individual students. Older students can enter their ID number for purchasing lunch at school, but this obviously takes more time."*

Weather permitting	*"You need… a place to hang coats up… before they come into the [lunch] line if you have RBL."*
Hand - washing	*"With RBL, there was the challenge of how do we make sure they have clean hands? We problem solved and ended up setting up hand sanitizer stations, but the cost was to great."*
No time to clean	*"[With RBL] the biggest challenge is getting them to… clean up [after lunch]."*
Transition time before eating	*"When students would go to recess, depending on where they were on campus, and on the playground, it took them substantially longer to reach the doors of the lunch room."*
No Perceived Barriers	*"As far as when we had recess before or after lunch, I didn't notice a difference."*

Resistance Towards Implementing RBL

Some resistance encountered from teachers, principals, and parents, comparable to that of previous research (Rainville et al., 2006), included the desire to maintain traditional scheduling. Despite the fact that hand sanitizers are a quick solution for hand sanitation, the request to avoid the student's daily use of the product was noted due to previous reports of possible acute intoxication (Joseph, 2011). Yet most respondents reported no resistance to previously implementing RBL or to implementing RBL in the future. A common response from the latter was that there was an overall lack of knowledge behind RBL and how it would benefit the students.

> *"I don't think [the school board is] necessarily against it. If I were to present them with a reason as to why they should implement RBL, I believe they wouldn't be opposed to it. It's just a matter of them wrapping their head around it."*

Previous studies have provided supplemental information to aid in the development and implementation of RBL. However, the necessity for additional research and evidence is evident.

Advice for Implementing RBL

Many of the responses associated with advice for future implementation were related to challenges that were faced during the school's experience of RBL. These included creating solutions to hand washing stations, making transition times from the playground more efficient, forming a schedule that works with the specialists and developing incentives for students to focus on eating to prevent late re-entry into the classroom. Others included input related to what is best for the children and to deal with the issues as they arise. Similar to the findings from Bark et al. (2010), participants in the current study discussed the importance of gaining support from all influential parties, including parents, teachers, school food service directors and additional members of the school board. Although some interviewees noted the importance of student support, it was reported that students are usually unaware of the schedule difference. Bounds et al. (2009) additionally found that the need for strong leadership and a positive attitude towards change was necessary to successfully implement the program. For schools considering making a change in their lunch schedule to RBL, these are factors that should be accounted for as well.

CONCLUSIONS AND APPLICATIONS

The promotion of physical activity for school-aged children through recess has been supported for decades due to the known benefits to a child's health and for creating social interactions with their peers (Michael & Zavacky, 2017). While research also supports the importance of students consuming adequate amounts of nutrients at lunch, the placement of recess in relation to lunch and how it may impact nutrient intake has

been reexamined in recent years. As the current study observed, in addition to previous research (Bark et al., 2010; Bounds et al., 2009; Rainville et al., 2006), the process of changing the lunch schedule and fully adopting the program requires a multi-faceted approach that considers all school entities.

The findings from the qualitative phase further validated the quantitative results that found the following associations: student enrollment and a school's history of RBL; student enrollment and reported benefits or barriers; as well as the benefits and barriers associated with students receiving free and reduced cost lunches. However, there was no correlation between a school's history of RBL and the reported benefits associated with the program. Yet the benefits and challenges reported in the current study may not apply to all schools across the nation due to the wide range of grade levels within Washington schools. Public schools with grades K-5 account for roughly 39.3% of the total public elementary schools in Washington (State of Washington Superintendent of Public Instruction, 2017); suggesting that certain findings from our study may not be applicable to all schools. These findings may additionally be difficult to parallel with schools nationwide due to the rainy weather commonly found in the western portion of the state. Bark et al. (2010) made similar conclusions, implying that unlike many schools located across the country, appropriate locations for weather permitting clothing are required in addition to the need for time-efficient hand washing procedures prior to eating.

As previously mentioned, to the knowledge of the researchers, this study is the first to analyze the various associations of a school's history of using the RBL schedule with its demographic characteristics. Although the limited number of responses to the online survey resulted in a response rate of 17.2%, this falls within the range of previous

response rates from similar studies in this field (15.8% - 30%) (Bark et al., 2010; Bounds et al., 2009). Through triangulation, the qualitative and quantitative results confirmed each other, further validating the results in each phase. Additionally, a higher percentage of schools having some experience with the RBL program was observed in the current study than what has previously been observed (75.8% vs. 18.4% and 55%), indicating that the continuing growth of research on RBL may be aiding schools to successfully implement this scheduling change. However, it is possible respondent bias occurred in the online survey. Participants may have been more inclined to respond to the survey questions if they had previous experience or knowledge about RBL; potentially skewing the results.

Another limitation of this study included omitted variable bias in the school demographics due to limited availability through the Washington State OSPI website. Additional variables, such as student to teacher ratios, could be used to find further associations with a school's prevalence of utilizing RBL. Finally, due to the limited data collected, multiple regression models were inconclusive and eliminated from our results.

While the Montana Team Nutrition (MTN) Program created educational materials to help schools successfully implement and maintain RBL (Montana Office of Public Instruction, 2003), it is evident that additional, more comprehensive resources are needed. Multiple participants reported that many schools are unaware of the existence of the program; therefore, supplemental research can provide further knowledge and acceptability of the program. An aspect of RBL that was highlighted by one of the telephone interviewees was the cost-effectiveness of the program. By scheduling recess prior to lunch, their school noticed the need for hand sanitizers to effectively clean hands

before eating. However, the cost of the sanitizing alcohol was too high to be sustainable. A possible solution for this is that the added cost could be worked into the school's annual budget or added as a required school supply item for students at the beginning of the school year. Additionally, it would be valuable to expand on previous research (Bergman et al., 2003; Getlinger et al., 1996; Hunsberger et al., 2014; Price & Just, 2015; Tanaka et al., 2005) by comparing and evaluating classroom behavior and the specific nutrients consumed in relation to the timing of a student's lunch. Although most studies show that students participating in RBL tend to consume a larger percentage of essential nutrients, a recent study found that students with RBL wasted less food yet Recess After Lunch resulted in the consumption of more vegetables specifically (Dallas, 2017). These findings indicate that the timing in which a student eats their lunch in relation to recess may play an important role on the specific nutrients consumed. Finally, future research can use the guidelines presented in this study to further support the implementation of a RBL schedule in schools that aim to promote the development of healthy lifestyle and eating patterns in children.

School nutrition professionals play a crucial role in the growth and development of school-aged children and the implementation of wellness programs within their own school settings. They can use the findings from the current study to provide supplemental knowledge on key challenges that can commonly arise during the transition of a new lunch and recess schedule and how to navigate these potential barriers for the successful implementation of an RBL program.

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APPENDIXES

Appendix A – Healthy Hunger-Free Kids Act: New Meal Patterns and Dietary Specifications

Final Rule Nutrition Standards in the National School Lunch and School Breakfast Programs

(U.S. Department of Agriculture, 2012)

	Breakfast Meal Pattern			Lunch Meal Pattern		
	Grades K-5 [a]	*Grades 6-8* [a]	*Grades 9-12* [a]	*Grades K-5*	*Grades 6-8*	*Grades 9-12*
Meal Pattern	**Amount of Food[b] Per Week (Minimum Per Day)**					
Fruits (cups) [c,d]	5 (1) [e]	5 (1) [e]	5 (1) [e]	2 ½ (½)	2 ½ (½)	5 (1) [e]
Vegetables (cups) [c,d]	0	0	0	3 ¾ (¾)	3 ¾ (¾)	5 (1) [e]
Dark green [f]	0	0	0	½	½	½
Red/Orange [f]	0	0	0	¾	¾	1 ¼
Beans/Peas (Legumes) [f]	0	0	0	½	½	½
Starchy [f]	0	0	0	½	½	½
Other [f,g]	0	0	0	½	½	¾
Additional Veg to Reach Total [h]	0	0	0	1	1	1 ½
Grains (oz eq) [i]	7-10 (1) [j]	8-10 (1) [j]	9-10 (1) [j]	8-9 (1)	8-10 (1)	10-12 (2)
Meats/Meat Alternatives (oz eq)	0 [k]	0 [k]	0 [k]	8-9 (1)	8-10 (1)	10-12 (2)
Fluid milk (cups)[l]	5 (1) [e]	5 (1) [e]	5 (1) [e]	5 (1) [e]	5 (1) [e]	5 (1) [e]
Other Specifications: Daily Amount Based on the Average for a 5-Day Week						
Min-max calories (kcal) [m,n,o]	350-500	400-550	450-600	550-650	600-700	750-850
Saturated fat (% of total calories) [n,o]	< 10	< 10	< 10	< 10	< 10	< 10
Sodium (mg) [n,p]	≤ 430	≤ 470	≤ 500	≤ 640	≤ 710	≤ 740
Trans fat [n,o]	Nutrition label or manufacturer specifications must indicate zero grams of trans fat per serving.					

[a] In the SBP, the above age-grade groups are required beginning July 1, 2013 (SY 2013-14). In SY 2012-2013 only, schools may continue to use the meal pattern for grades K-12 (see § 220.23).
[b] Food items included in each food group and subgroup and amount equivalents. Minimum creditable serving is ⅛ cup.
[c] One quarter-cup of dried fruit counts as ½ cup of fruit; 1 cup of leafy greens counts as ½ cup of vegetables. No more than half of the fruit or vegetable offerings may be in the form of juice. All juice must be 100% full-strength.

[d] For breakfast, vegetables may be substituted for fruits, but the first two cups per week of any such substitution must be from the dark green, red/orange, beans and peas (legumes) or "Other vegetables" subgroups as defined in §210.10(c)(2)(iii).
[e] The fruit quantity requirement for the SBP (5 cups/week and a minimum of 1 cup/day) is effective July 1, 2014 (SY 2014- 2015).
[f] Larger amounts of these vegetables may be served.
[g] This category consists of "Other vegetables" as defined in §210.10(c)(2)(iii)(E). For the purposes of the NSLP, "Other vegetables" requirement may be met with any additional amounts from the dark green, red/orange, and beans/peas (legumes) vegetable subgroups as defined in §210.10(c)(2)(iii).
[h] Any vegetable subgroup may be offered to meet the total weekly vegetable requirement.
[i] At least half of the grains offered must be whole grain-rich in the NSLP beginning July 1, 2012 (SY 2012-2013), and in the SBP beginning July 1, 2013 (SY 2013-2014). All grains must be whole grain-rich in both the NSLP and the SBP beginning July 1, 2014 (SY 2014-15).
[j] In the SBP, the grain ranges must be offered beginning July 1, 2013 (SY 2013-2014).
[k] There is no separate meat/meat alternate component in the SBP. Beginning July 1, 2013 (SY 2013-2014), schools may substitute 1 oz. eq. of meat/meat alternate for 1 oz. eq. of grains after the minimum daily grains requirement is met.
[l] Fluid milk must be low-fat (1 percent milk fat or less, unflavored) or fat-free (unflavored or flavored).
[m] The average daily amount of calories for a 5-day school week must be within the range (at least the minimum and no more than the maximum values).
[n] Discretionary sources of calories (solid fats and added sugars) may be added to the meal pattern if within the specifications for calories, saturated fat, trans fat, and sodium. Foods of minimal nutritional value and fluid milk with fat content greater than 1 percent milk fat are not allowed.
[o] In the SBP, calories and trans fat specifications take effect beginning July 1, 2013 (SY 2013-2014).
[p] Final sodium specifications are to be reached by SY 2022-2023 or July 1, 2022. Intermediate sodium specifications are established for SY 2014-2015 and 2017-2018. See required intermediate specifications in § 210.10(f)(3) for lunches and § 220.8(f)(3) for breakfast.