Exploressing School Employee Physical Activity Behaviors and Perceptions

Ann Pulling Kuhn

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EXPLORING SCHOOL EMPLOYEE PHYSICAL ACTIVITY BEHAVIORS AND PERCEPTIONS

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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December 2019
This Dissertation by: Ann Pulling Kuhn

Entitled: Exploring School Employee Physical Activity Behaviors and Perceptions

has been approved as meeting the requirement for the Degree of Doctor of Philosophy in the College of Natural and Health Sciences in the School of Sport and Exercise Science, Program of Physical Education and Physical Activity Leadership.

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ABSTRACT


Employee involvement in physical activity (PA) while at school has been understudied and is relatively unknown (Chen & Gu, 2018; Hunt & Metzler, 2017). The purposes of this dissertation study were to (a) describe school employees’ PA behaviors while at school, and (b) explore school employees’ perceptions of the feasibility of school employee PA interventions found to be effective in published research.

An explanatory sequential mixed methods design was used to collect school employee self-reported PA behaviors and district/school demographic information via an electronic survey from 488 school employees in northern Colorado. Data were analyzed using the Kruskal-Wallis H test, Mann-Whitney U test, and multiple linear regressions to assess how employees’ PA levels while at school varied by employee or district/school demographic variables. From the quantitative sample, a subsample of eight participants were stratified into a low PA group \( (n = 4) \) and a mod-high PA group \( (n = 4) \) to participate in individual interviews to explore school employees’ perceptions of: (a) PA while at school, and (b) the feasibility of school employee PA interventions found to be effective in published research. Qualitative data were analyzed within and across groups using the constant comparison method.
The quantitative data revealed (a) males were more active than females, (b) specials teachers were more active than general education classroom teachers, (c) age negatively predicted physical activity, (d) employees in rural school districts were more active than those in suburban districts, and (e) employees who had an employee wellness program were more active than those without an employee wellness program. There were no significant results for years of full-time experience, level of instruction, highest degree earned, or district free/reduced lunch percentage. The qualitative data revealed (a) employees perceived a lack of time as a barrier to their PA while at school; (b) employees recognized the importance of PA for their physical, mental, and work-related health; (c) the presence of a PA support system was needed for employee PA in the form of a wellness program or committee, administrative support, coworker support, and on-campus facilities for PA but low PA participants lacked a wellness program or committee and coworker support; and (d) employees identified facilitative strategies and implementation skills to overcome barriers to be physically active while at school in the low PA group but not in the mod-high PA group.

In conclusion, school employees were interested in and valued PA but faced challenges with fitting it in while at school. Future work is needed to identify strategies and interventions for school employees to be active during the workday. Increasing PA levels of school employees could have implications for their daily health and wellness and contribute to the multicomponent implementation of comprehensive school physical activity programs.
ACKNOWLEDGMENTS

To my husband and best friend, Brandon, I would never have been able to do this without you. Thank you for taking such good care of me. I love you.

Thank you to my mentor of six years, Dr. Russ Carson, for all of your support and guidance. There are not enough words to express how much I have enjoyed working with you and learning from you. Thank you for pushing me, but teaching me to enjoy the process.

Thank you to my committee members—Dr. Brian Dauenhauer, Dr. Jaimie McMullen, and Dr. Danielle Brittain—for your never-ending support throughout this process. Each one of you has supported me in different ways, both professionally and personally and I cannot thank you enough.

Thank you to my parents who always believed in me and supported me. Both of you and Brandon deserve all the credit. I love you!

To my friends from the UNC Active Schools Institute (Peter Stoepker, Lauren Von Klingraeff, Mike Capps, & Katie Hodgin), thank you for the life-long friendships I know we’ll have and most of all, for the laughs.
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CHAPTER I

INTRODUCTION TO THE STUDY

In 2014, the Association for Supervision and Curriculum Development (ASCD) and Centers for Disease Control (CDC, 2015a) expanded the eight-component comprehensive school health model to the 10-component whole school, whole community, whole child (WSCC) model (Lewallen, Hunt, Potts-Datema, Zaza, & Giles, 2015). The WSCC model served as an ecological approach to school-wide health promotion through greater collaboration between the education and health sectors (ASCD, 2018). One of the 10 components, employee wellness, recognized schools as a worksite where employees’ physical and mental health could be fostered by implementing a coordinated set of programs, policies, and benefits that supported healthy eating, physical activity (PA), stress management, and a safe work environment (Lewallen et al., 2015). Employee wellness programs have been found to be effective at improving employees’ physical health (e.g., cardiovascular risk factors, physical activity, and nutrition; Borah et al., 2015; Radler, Marcus, Griebs, & Touger-Decker, 2015; Sternfeld et al., 2009), mental health (e.g., depression and anxiety; Agarwal et al., 2015; Munz, Kohler, & Greenberg, 2001), and work-related outcomes (e.g., stress, productivity, and absenteeism; Burton, McCalister, Chen, & Edington, 2005; Munz et al., 2001).

Although employee wellness programs target many aspects of health, an approach that specifically targets the PA of employees in schools is the staff involvement component of comprehensive school physical activity programs (CSPAP; CDC, 2013).
A CSPAP is a school-wide approach to increasing PA of individuals within schools and is comprised of five components, one of which is the staff involvement component. Staff involvement focuses on school employees and includes employee participation in employee wellness programs and personal engagement in PA while at school (Shape America, 2015). The impact of staff involvement in PA is understudied and relatively unknown (Chen & Gu, 2018; Hunt & Metzler, 2017). Furthermore, studies that have included school employee wellness as part of a multicomponent PA program did not report enough information about the design, implementation, or nature of the employee wellness initiatives (Russ, Webster, Beets, & Phillips, 2015). Knowledge of this information would be useful in evaluating and developing effective school employee wellness programs (Russ et al., 2015). Therefore, it was essential to identify school employee PA interventions found to be effective in published research. Also, it was critical to understand how and why employees were physically active during the school day and how they perceived the feasibility of employees’ school PA interventions found to be effective in published research.

**Purpose of the Dissertation**

The purposes of this mixed methods dissertation study were to (a) describe school employees’ PA behaviors while at school and (b) explore school employees’ perceptions of the feasibility of school employee PA interventions found to be effective in published research. An explanatory, sequential, mixed methods design was used to collect quantitative data from school employees and then compare those results with follow-up qualitative data (Creswell & Plano Clark, 2011). In the quantitative phase, employee and school demographic information as well as school employee self-reported PA behaviors
were collected via an electronic survey from school employees in northern Colorado.

Data were analyzed to assess how school employees’ workday PA levels varied by employee or school demographic variables. In the qualitative phase, follow-up individual interviews were conducted with a subsample of the school employees to expand upon and complement the quantitative results. In the qualitative follow-up, the aim was to explore school employees’ perceptions of (a) PA while at school and (b) the feasibility of school employee PA interventions found to be effective in published research.

**Research Questions**

The following research questions were answered in this dissertation:

Q1 In what ways do school employees’ PA behaviors while at school vary by employee and school demographics?

Q2 What are school employees’ perceptions of the feasibility of effective school employee PA interventions published to date, and in what ways do these perceptions vary by school employee PA behaviors while at school?
CHAPTER II
REVIEW OF THE LITERATURE

One of the 10 WSCC model components, employee wellness, recognized schools as a worksite where employees’ physical and mental health could be fostered by implementing a coordinated set of programs, policies, and benefits that targeted risk factors, health conditions, and employee safety (Lewallen et al., 2015). Employee wellness programs situated within the WSCC model should target all school employees including teachers, administrators, and support staff and were recommended to be implemented through partnerships between schools and health insurance providers (CDC, 2015a). According to the CDC (2015a), implementing school employee wellness programs could reduce turnover and absenteeism, decrease the cost of substitutes, and increase productivity. Additionally, these programs targeted a variety of health-related issues such as nutrition, physical activity (PA), tobacco use, stress management, health conditions (e.g., diabetes or depression), and environmental safety (CDC, 2015a).

Comprehensive School Physical Activity Programs

Although employee wellness programs could target a variety of health-related outcomes, an approach that specifically targeted the PA of school employees was the staff involvement component of CSPAP (Shape America, 2015). A CSPAP is a school-wide approach used to increase PA opportunities in schools and is comprised of five components: (a) physical education, (b) PA before and after school, (c) PA during school, (d) family and community involvement, and (e) staff involvement (see Figure 1). The
CSPAP model is guided by a social ecological perspective that acknowledges how an individual’s PA while at school is influenced by multiple levels of his/her environment (Carson, Castelli, Beighle, & Erwin, 2014). The framework displays four levels of influence (i.e., components, facilitators, leaders, and culture) that reflect the micro-, meso-, exo-, and macrosystems of influence on school-based PA behaviors. At the center of the framework is the goal of a CSPAP, which is engagement in daily PA behaviors while at school by youth and adults (see Figure 2). At the microsystem level are the five components of a CSPAP (e.g., staff involvement) that provide PA opportunities around the school setting. At the mesosystem level are five CSPAP facilitators: knowledge (i.e., understanding), skills (i.e., competencies), dispositions (i.e., self-efficacy beliefs), resources (i.e., financial support, built environment), and safety. The exosystem level is comprised of three leaders in the school community: (a) CSPAP leader, (b) supportive administration, and (c) CSPAP committee. At the macrosystem level, the school culture promotes physical activity through policy and normative behaviors and beliefs. For a CSPAP to be effective, aspects of each level must synergistically work together to effectively increase the PA of individuals in schools.
Figure 1. Comprehensive school physical activity program model.
Staff Involvement

Staff involvement includes employee participation in employee wellness programs and personal engagement in PA while at school (CDC, 2013). School employee wellness programs have positively impacted employee health and work performance variables such as job satisfaction, job performance, and absenteeism (LeCheminant, Merrill, & Masterson, 2015). Likewise, school employee PA during the workday might blunt the effect emotional exhaustion has on teachers’ quitting intentions (Carson, Baumgartner, Matthews, & Tsouloupas, 2010). Teachers have also reported PA
to be the most commonly used and most effective stress coping strategy (Carson, Baumgartner, Ota, Pulling Kuhn, & Durr, 2016). Additionally, student PA benefits from school employees who are engaged in or promote moderate to vigorous physical activity (MVPA) at school via role modeling (Eather, Morgan, & Lubans, 2013; Huberty, Beets, Beighle, & Mckenzie, 2013). Since previous research identified school employees as ideal targets for employee wellness programs due to low PA levels, there was a need to increase implementation of these programs in schools (Webber et al., 2012). However, recent CSPAP literature reviews suggested staff involvement in PA remained understudied (Chen & Gu, 2018; Hunt & Metzler, 2017). Therefore, driven by the WSCC and CSPAP models, the focus of this study was on school employee PA.

**Employee Physical Activity**

According to the CDC (2015b), PA can lower the risk of cardiovascular disease, diabetes, some cancers, and other chronic diseases as well as improve mental health and mood. For these reasons, the 2018 Physical Activity Guidelines (Office of Disease Prevention and Health Promotion, 2018) recommended adults obtain at least 150 minutes of moderate intensity activity or 75 minutes of vigorous intensity activity or an equivalent combination of moderate and vigorous intensity activity that equals 150 minutes per week. However only about one in five adults meets these guidelines (CDC, 2015b). Despite a large variety of interventions designed to increase PA (Cleland et al., 2017; LaPlante & Peng, 2011), the percentage of people who participated in sports, exercise, or recreation in the United States on an average day rose only 4% from 2003 to 2016 (Bureau of Labor Statistics, 2017). As a result, worksites have been deemed an
appropriate setting for promoting PA programs for their employees because worksites might address barriers to PA such as safety and lack of social support (CDC, 2017).

**Worksite physical activity programs.** In the United States, more than 150 million American adults participate in the labor force each day with employees spending on average approximately 7.9 hours per day at their jobs (Bureau of Labor Statistics, 2017). According to ecological models of health, PA promotion should occur not only at the individual level but also at the institutional level (e.g., worksites; Sallis, Owen, & Fisher, 2008). Worksite PA programs have been used to increase employee PA and improve overall health and well-being outcomes (Zacharia et al., 2013). Physical activity programs such as pedometer walking challenges, group-based PA interventions, or treadmill workstations have been known to positively impact employee physical health through increasing PA, decreasing sedentary time, and improving cardiorespiratory fitness and cardiovascular risk factors (Butler, Clark, Burlis, Castillo, & Racette, 2015; John et al., 2011; Macniven, Engelen, Kacen, & Bauman, 2015; Pedersen, Halvari, & Williams, 2018). Likewise, worksite PA programs might also positively impact employee work-related outcomes such as productivity, absenteeism, and job stress (Burton et al., 2005). As a result, these programs are prevalent among various work environments but not in schools (Eaton, Marx, & Bowie, 2007).

**School employee physical activity.** Although school staff are ideal targets for worksite wellness programs (Webber et al., 2012), school staff wellness programs are the least commonly implemented component of comprehensive school health programs (Eaton et al., 2007). The School Health Policies and Practices Study (CDC, 2016a) showed only 54% of school districts required schools to have an employee wellness
program and 27.8% provided funding to incentivize employee participation. Likewise, a study that examined the implementation of the Child Nutrition and WIC Reauthorization Act (Moag-Stahlberg, Howley, & Luscri, 2008) found only 36% of schools in the United States included staff wellness in their local wellness policy implementation in 2008. Although these programs might not be implemented often for school employees, some research suggested employee PA programs in schools could benefit teachers.

Relationships between PA and employees’ work-related well-being have been examined in research. In a self-report study, both workplace and leisure-time PA were negatively related to teachers’ emotional exhaustion (Carson et al., 2010). Similarly, another study found teachers who reported high levels of PA, among other healthy behaviors, had higher levels of job satisfaction, job performance, and lower absenteeism (LeCheminant et al., 2015). Physical activity has also been positively related to teachers’ work ability (Grabara, Nawrocka, & Powerska-Didkowska, 2018), harmonious passion for work (Caudroit, Boiché, Yannick, Scanff, & Trouilloud, 2011), and life satisfaction (Nishida & Otomo, 2010). Like other worksite PA programs, school employee PA programs could also be effective in improving teacher physical health by lowering blood pressure, blood glucose, cholesterol, body mass index, and other risk factors (Merrill & Sloan, 2014).

**School employee physical activity levels.** Three studies described participation in PA among school employees. One study assessed school employee PA in the United States via accelerometry as a baseline measure before implementing a worksite wellness program and found employees averaged less than one minute of daily MVPA (Webber et al., 2012). Two other studies used the International Physical Activity Questionnaire
(IPAQ; 2005) to obtain self-report measures of PA. The study conducted in the United States found school employees did not attain a health-enhancing level of PA (Siegel, Prelip, Erausquin, & Kim, 2010), while the study examining Flemish employees found 66% met the PA guidelines of at least 150 minutes of moderate to vigorous PA per week (Bogaert, De Martelaer, Benedict, Clarys, & Zinzen, 2015). The results of these studies showed employee PA levels might vary by location. Furthermore, these studies did not focus on PA while at school, which was a focus of staff involvement (CDC, 2013).

**Employee perceptions of school employee physical activity programs.**

Employee perceptions of employee PA programs were varied. One study examined employees’ perceptions of a staff walking program via an online questionnaire (Langley & Kulina, 2018). The program was implemented over five months in congruence with a student walking program. Walking schedules varied across days of the week so that all employees had the opportunity to participate. Mileage goals were set each month, a tracking system for participation was utilized, and monthly incentives were provided. Overall, employees reported positive perceptions of the program, indicating they perceived increases in energy levels and an ability to bond with co-workers and students. However, limitations to the program included challenges walking in professional clothing and additional duties that resulted in a lack of time, thereby prohibiting participation. Employees also indicated that expanding the program with grade-level walking challenges and fitness classes (e.g., yoga) was possible.

Another study examined Flemish teachers’ perceptions of PA programs during the workday before implementing a formal program (Bogaert et al., 2015). Since a classic worksite PA program might not be directly applicable to the school setting, one study
deemed it necessary to consult teachers to develop a worksite PA program (Robroek, van Lenthe, van Empelen, & Burdorf, 2009). Teacher PA levels were obtained via the IPAQ (2005) and teacher perspectives of PA during the workday were collected via focus groups (Sallis et al., 2008). The study found teachers met PA guidelines and perceived a classic worksite intervention to be completely unsuitable for them. Perceived barriers were (a) job-related responsibilities, (b) no facility accommodation, (c) varying PA interests, (d) no management support, (e) responsibilities outside of school (e.g., family), (f) not wanting to be active with co-workers, and (g) perceptions of PA not being relaxing in the school environment. Although the results indicated teachers perceived PA during the workday to be unfeasible, the authors stood firm on the notion that schools should be an environment to enable teachers to become competent in PA since actions to promote PA should intervene at multiple levels including institutional level (Sallis et al., 2008). Therefore, further investigation into the development of a feasible school employee PA program was needed by examining school employees’ PA levels and their perceptions of PA in the workplace.

**Theoretical Framework: Social Cognitive Theory**

A theory is a set of interrelated concepts that present a systematic view of relationships among variables in order to explain or predict a certain phenomenon (Kerlinger, 1986). Theories are valuable for guiding the development, implementation, and assessment of interventions by describing why a problem exists and identifying factors that can solve the problem (Glanz, Rimer, & Viswanath, 2008). A variety of theories have been used to guide PA interventions (e.g., self-determination theory, transtheoretical model, social cognitive theory, theory of planned behavior; McDermott,
Oliver, Iverson, & Sharma, 2016; Pedersen, Halvari, & Olafsen, 2018; Richards, Ogata, & Cheng, 2017; Scruggs et al., 2018) as well as CSPAP research (self-determination theory, social learning theory, social-ecological perspective, diffusion of innovations theory; Babkes Stellino & Sinclair, 2013; Carson et al., 2014; Lorenz et al., 2016; Webster et al., 2013, 2015). For this study, social cognitive theory (SCT; Bandura, 1986) was used as the theoretical framework to examine the personal, cognitive, and environmental factors that might be related to school employees’ PA behaviors. Social cognitive theory was chosen as a theoretical framework because it is commonly used to guide PA interventions for adults in various settings (Focht et al., 2017; Martin, Prayor-Patterson, Kratt, Young, & Person, 2007). Social cognitive theory not only acknowledges ecological factors could shape health-promoting behaviors but also posits an individual’s cognitive factors could play a role in behavior change (Bandura, 1986).

Social cognitive theory was originally known as social learning theory, which was based on the premise that humans learn behaviors from the social environment via observational learning (Bandura, 1977). However, social learning theory was later expanded to SCT when cognitive concepts were integrated into the model (Bandura, 1986). Social cognitive theory suggests human behavior is the product of dynamic and reciprocal interactions among (a) personal and cognitive factors, (b) environmental factors, and (c) behavioral factors. The theoretical relationship among these factors is referred to as “reciprocal determinism,” which recognizes that each factor could influence or be influenced by the others (Bandura, 1986). The personal/cognitive and behavioral interaction involves the reciprocal influences of thoughts, emotions, or physical characteristics and one’s actions. The environmental and behavioral interaction involves
modifying expectations, beliefs, and emotions as a result of reacting to the social environment. Additionally, physical features such as age, race, and sex might trigger reactions from the social environment. The environmental and personal/cognitive interaction involve the behavior altering the environment, which is followed by the altered environment influencing the behavior. The personal, cognitive, behavioral, and environmental variables involved in this study are displayed in Figure 3 and were guided by the CSPAP conceptual framework mentioned previously (Carson, et al., 2014).
Figure 3. Reciprocal relationship of the three determinants of social cognitive theory (Bandura, 1986).
Personal and Cognitive Factors

Personal and cognitive factors are considered to be within-person attributes that include physical characteristics and psychological factors (Bandura, 1986). Personal factors could include variables such as sex, ethnicity, temperament, and genetic predisposition. Other studies have examined teacher personal factors (i.e., gender) related to school employees’ daily moderate to vigorous PA behaviors and found male employees were significantly more active than female teachers (Bogaert et al., 2015). As such, one aim of this study was to determine how employees’ PA behaviors while at school might vary by personal factors (i.e., age, gender, highest degree earned, and years of full-time experience). Cognitive factors could include expectations, self-efficacy beliefs, and knowledge among other psychological determinants (Glanz et al., 2008).

Research related to workplace PA examined the relationship between employee social-cognitive variables (i.e., self-efficacy) and workplace PA participation and found self-efficacy was a partial mediator of the relationship between the environment and workplace PA participation (Prodaniuk, Plotnikoff, Spence, & Wilson, 2004). In this study, school employees’ personal capacity and values (i.e., knowledge, skills, attitudes) and personal beliefs (i.e., beliefs related to overcoming barriers and maximizing supports related to PA while at school) were explored in semi-structured interviews.

Environmental Influences

Environmental factors make up the physical surroundings (e.g., sidewalks) and social environment (e.g., family and friends; Bandura, 1986). Environmental factors that inhibited school employees PA participation while at school have been identified as (a) no facility accommodation and (b) no management support (Bogaert et al., 2015). One
aim of this study was to determine how school employees’ PA might vary by school demographic variables (e.g., school locale, presence of employee wellness program). This study also explored school employees’ perceptions of environmental factors related to the feasibility of implementing school employee PA interventions found in published research such as the school setting (e.g., space, equipment facilities, built environment, safety, presence of employee wellness program), school resources (e.g., support personnel, financial support, time, space, equipment and facilities, built environment, safety), and school colleagues (wellness champion, CSPAP/employee wellness program committee, supportive administrator, and normative behaviors and beliefs).

**Behavior**

The behavior factor, or an individual’s actions (Bandura, 1986), for this study referred to employees’ PA behaviors while at school (i.e., minutes per day spent in walking, moderate, and vigorous PA intensities that only occurred while they were at work). Related to SCT, the intent of this mixed methods study was to explore how employees’ personal factors (i.e., age, gender, highest degree earned, and years of full-time experience), cognitive factors (i.e., knowledge, skills, attitudes towards PA; beliefs in their ability to overcome barriers/maximize supports related to PA while at school), and environmental factors (i.e., space, equipment, facilities, built environment, safety, presence of employee wellness program, tools, incentives, financial support, time, presence of wellness champion, wellness committee, supportive administrator, normative behaviors and beliefs) varied by employees’ PA behaviors while at school, and employees’ perceptions of the most effective employee PA interventions revealed in published research.
**Purpose**

Guided by the SCT, the purpose of this mixed methods study was to (a) describe school employees’ PA behaviors while at school and (b) explore school employees’ perceptions of the feasibility of school employees’ PA interventions found to be effective in published research. An explanatory sequential mixed methods design was used involving collecting quantitative data and then exploring the quantitative results with in-depth qualitative data. In the quantitative phase of the study, employee and school demographic information and self-reported PA levels were collected via an electronic survey from school employees in northern Colorado. Data were analyzed to assess the degree to which employees’ PA behaviors while at school varied by employee or school demographic variables. The qualitative phase was conducted as a follow up to complement the quantitative results. In the qualitative follow-up, the aim was to explore school employees’ perceptions of (a) school employee PA while at school and (b) the feasibility of school employees’ PA interventions found to be effective in published research.

**Mixed Methods Research Questions**

The following specific research questions were answered in this mixed methods study:

Q1. In what ways do school employees’ PA behaviors while at school vary by employee and school demographics?

Q2. What are school employees’ perceptions of the feasibility of effective school employee PA interventions published to date, and in what ways do these perceptions vary by school employee PA behaviors while at school?
CHAPTER III
METHODOLOGY

The purpose of this mixed methods study was to (a) describe school employees’ PA behaviors while at school and (b) explore school employees’ perceptions of the feasibility of school employee PA interventions found to be effective in published research. A mixed methods design was utilized to describe and explore employees’ school PA levels (Creswell & Plano Clark, 2011). In this study, the researcher used a sequential explanatory mixed methods study design that incorporated the collection and analysis of quantitative data followed by the collection and analysis of qualitative data (Creswell & Plano Clark, 2011). Qualitative results of this study were used to explore and interpret the quantitative findings (Creswell, 2003). A survey consisting of employee and school demographic questions and the IPAQ (2005) were used to collect quantitative data. Qualitative data were collected through semi-structured interviews conducted by the researcher either in-person or via phone to gain a deeper understanding of employees’ perceptions of their school PA and the feasibility of employee PA interventions found to be effective in published research. According to Creswell (2003), collecting both quantitative and qualitative data could strengthen a study by providing additional insight that would otherwise not be provided by using only one method.
Research Design

Mixed Methods Design

In this study, the researcher utilized a mixed methods, sequential, explanatory design with multiple worldviews. A mixed methods design collects quantitative and qualitative data to answer research questions and was used in this study because multiple sources of data could enhance our understanding of the context and provide more evidence to support the findings than one method alone (Creswell & Plano Clark, 2011). Based on Bryman’s (2006) typologies of reasons for using mixed methods, the two main reasons for this study were (a) sampling: quantitative data were used to determine the sample for the qualitative phase and (b) explanation: qualitative data were used to explain quantitative results. After both sets of data were collected and analyzed separately, all results were connected and an analysis of how the qualitative data helped explain the quantitative data was conducted (Creswell & Plano Clark, 2011). For a sequential explanatory design, Creswell and Plano Clark (2011) recommended a postpositivist worldview be used for the quantitative phase and a constructivist view be used for the qualitative phase. Postpositivism is a set of beliefs that guides inquiries based on cause and effect thinking and constructivism is the idea that knowledge or understanding comes from multiple realities formed by participants’ subjective views (Patton, 2015).

Sequential Explanatory Design

In a sequential explanatory design, the researcher conducts a quantitative phase and then follows up on results with a qualitative phase (Creswell & Plano Clark, 2011). Although two types of explanatory design variants exist, the follow-up explanations variant used qualitative data to help explain the quantitative results (Creswell & Plano
Clark, 2011). This study used fixed mixed methods in which both phases were predetermined at the start of the research study; however, it is common for the results of the quantitative phase to influence the qualitative phase based on the researcher’s interpretation of the quantitative data (Creswell & Plano Clark, 2011). Four procedural steps were involved in conducting an explanatory design: (a) design and implement a quantitative phase by collecting and analyzing quantitative data, (b) identify specific quantitative results that required further explanation to guide the development of the qualitative phase (e.g., refining research questions), (c) design and implement the qualitative phase by collecting and analyzing qualitative data, and (d) interpret the quantitative and qualitative data together to determine the extent to which the qualitative data provided additional insight or explained the quantitative data (Creswell & Plano Clark, 2011).

**Mixed Methods in School Physical Activity Research**

A mixed methods sequential explanatory design was chosen because it is commonly used in educational research and is useful in assessing and explaining mechanisms behind relationships or trends (Creswell & Plano Clark, 2011). Moreover, the use of mixed methods designs was recommended to advance our understanding of PA in educational contexts (Castelli, Carson, & Kulmina, 2017). Mixed methods in school PA research has been used to (a) examine the implementation processes of a classroom movement integration program (Webster, Weaver, Egan, Brian, & Vazou, 2018), (b) examine the leadership and implementation of an after school running program for girls (Aidyn, Bell, Lohman, Beets, & Reynolds, 2016), and (c) determine teacher and student
responses to classroom exercise breaks and how responses varied by duration (Howie, Newman-Norlund, & Pate, 2014).

Participants

For the quantitative phase, a list of employees to be solicited for participation in the online survey was created via searching school and district websites and contacting district wellness coordinators of three school districts. Specifically, a convenience sample was used for the quantitative phase to obtain participants who are easily accessible and willing to participate (Patton, 2015). A limitation of using a convenience sample was it did not result in a representative sample since the school districts were located in suburban and rural areas and had mid-low and mid-high socioeconomic status (SES) levels based on National Center for Educational Statistics categories (NCES; Colorado Department of Education, 2013). A stratified sample was used in the qualitative phase to capture variations that occurred across the two PA categories determined by the IPAQ (2005; i.e., low PA and moderate-high PA). The sample was double-blinded as neither the researcher nor the participant knew which PA category the participant was placed. A sub-sample of approximately four participants per PA category (i.e., low PA and moderate-high PA) was solicited for participation in the qualitative phase. Therefore, a sample of eight (i.e., two groups x four) participants was obtained for the qualitative phase. Including three or more participants per group was recommended by Onwuegbuzie and Leech (2007) to obtain data saturation within groups and to avoid internal generalization.
Quantitative Participants

According to Onwuegbuzie and Collins (2007), convenience sampling involves choosing settings or individuals who are accessible and willing to participate in the study. Employees from all schools in three northern Colorado school districts were solicited to participate in this study due to their close proximity to the researcher and the researcher’s preexisting relationship with the school districts. Participants were 488 adults who worked full-time as teachers, administrators, or support staff in elementary and secondary schools. As of the 2016-2017 academic year, Greeley District 6 had a total of 1,751 employees, a total student enrollment of 21,938 students, a free and reduced lunch percentage of 62%, and was composed of 60% secondary schools (Colorado Department of Education, 2013). Weld County School District RE-8 had a total of 263 employees, a total student enrollment of 2,428 students, a free and reduced lunch percentage of 69%, and was composed of 33.3% elementary schools. Weld County School District RE-1 had a total of 333 employees, a total student enrollment of 2,004 students, a free and reduced lunch percentage of 49%, and was composed of 50% elementary schools.

A power analysis was conducted to determine the number of participants needed to detect a true effect on the primary outcomes (i.e., physical activity behaviors; Meyers, Gamst, & Guarino, 2017). Based on an alpha level of .05, 80% power, and an expected effect size of .21 (Bogaert et al., 2015), it was calculated that 180 participants would be required to detect a between-group difference. The effect size of .21 was based on a similar study that examined differences in Flemish employees’ physical activity levels by demographic variables (e.g., teaching subject; Bogaert et al., 2015). Approval from the University of Northern Colorado’s Institutional Review Board was obtained prior to data
collection to ensure the protection of human participants (see Appendix A). Employees received the Qualtrics survey electronically during the months of January and February of 2019. After the survey was sent electronically, follow-up reminder emails were sent after seven days. The survey remained available for approximately two weeks for each district. Those who completed the online survey were compensated with $20 electronic Amazon gift cards.

**Qualitative Participants**

For the qualitative phase of the study, a sub-sample of eight school employees were obtained via stratified sampling from the full sample ($N = 488$) of the quantitative phase (Onwuegbuzie & Collins, 2007). All participants were school employees who worked in a public school in one of three school districts in northern Colorado. Criteria for participant selection for the current study were based on (a) PA category determined by the IPAQ, (b) district locale, (c) years of fulltime experience in current position, and (d) gender (see Table 1).

**Table 1**

*Qualitative Participant Recruitment Criteria*

<table>
<thead>
<tr>
<th>Years of Experience</th>
<th>Gender</th>
<th>PA Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low PA</td>
</tr>
<tr>
<td>Less Experienced</td>
<td>Male</td>
<td>1 Suburban</td>
</tr>
<tr>
<td>(&lt; 20 yrs)</td>
<td>Female</td>
<td>1 Suburban</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mod-High PA</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>1 Suburban</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1 Suburban</td>
</tr>
<tr>
<td>More Experienced</td>
<td>Male</td>
<td>1 Rural</td>
</tr>
<tr>
<td>(&gt; 20 yrs)</td>
<td>Female</td>
<td>1 Rural</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Stratified sampling was done by selecting participants from different subgroups of the population (Patton, 2015). This strategy was used because it was well suited for subgroup sampling designs (Onwuegbuzie & Leech, 2007). Selection of the interview participants was based on their PA levels determined by their IPAQ (2005) scores and their willingness to participate in the interview. Participant selection was double-blinded. A sub-sample of four participants per PA category were solicited for participation in the qualitative phase. Therefore, a total sample of eight (i.e., two subgroups x four) participants was obtained for the qualitative phase (Onwuegbuzie & Leech, 2007). Including three or more participants per subgroup was recommended by Onwuegbuzie and Leech (2007) to obtain data saturation within each subgroup and to avoid internal generalization. Individual interviews were conducted by the researcher either in-person at the participant’s school or via phone and were digitally audio recorded with permission from each participant. Those who participated in an interview were compensated with a $25 gift card. This incentive was explained to participants in recruitment emails and by the researcher before conducting the interview.

Instrumentation

Quantitative Phase

The online survey obtained information on employee demographic variables and employee PA behaviors while at school and consisted of the following tools: (a) demographic survey and (b) the IPAQ (2005) to assess PA while at school.

Demographics. For a full understanding of the employee sample, demographic information was collected including name of school district, name of school, age, gender, years of full-time experience in current position, highest degree earned, level of
instruction (i.e., grade level), current position, and if there was a current school employee wellness program. Name and email address were obtained to contact participants about the incentive for completing the survey and a potential follow-up interview. The researcher obtained information regarding district locale and SES (% free/reduced lunch) from district websites (see Appendix B for the full questionnaire).

**Employee physical activity levels.** The long version of the IPAQ (2005) was used to estimate employees’ time spent in job-related PA during the past seven days. The IPAQ was developed for population surveillance of PA among adults who ranged from 15-69 years (IPAQ, 2005). In this tool, the frequency and duration of walking, moderate, and vigorous intensities of PA was self-reported and provided an estimation of the amount of walking-, moderate-, and vigorous-intensity PA performed during the last seven days (Vandelanotte, De Bourdeaudhuij, Philippaerts, Sjöström, & Sallis, 2005). The IPAQ contains questions from four domains: (a) job-related PA; (b) transportation PA; (c) housework, house maintenance, and family care PA; and (d) recreation, sport, and leisure-time PA. Since the current study concerned PA while at school, only six questions from the job-related PA domain were used. Job-related questions on the IPAQ asked participants to estimate the *frequency* (times per week; e.g., “During the last 7 days, on how many days did you walk for at least 10 minutes at a time as part of your work”) and *duration* (minutes and/or hours per day; e.g., “How much time did you usually spend on one of those days walking as part of your work”) of walking, moderate, and vigorous PA intensities performed at work. Since this study only examined PA while at school, the beginning of each question regarding frequency was modified to correspond to a five-day work week (e.g., “During the last 7 days…” was changed to
“During a typical work week…”) and the options provided started at “1 day per week” and maxed out at “5 days per week.” The decision to use the IPAQ was based on the use of the tool in examining PA levels in workplaces (Hansen, Blangsted, Hansen, Søgaard, & Sjøgaard, 2010) and in school employees (Bogaert et al., 2015; Spittaels, De Bourdeaudhuij, Brug, & Vandelanotte, 2007). Additionally, the job-related domain of the IPAQ was deemed a moderately good measure of time spent in workday MVPA as compared with accelerometer data (Kwak, Hagströmer, & Sjostrom, 2012). The IPAQ has provided acceptable levels of validity and test-retest reliability for assessing PA in healthy adults in several studies (intraclass correlation coefficients = 0.71 – 0.89; Dinger, Behrens, & Han, 2006; Hagstromer, Oja, & Sjostrom, 2006). Appendix C provides a full list of questions.

Scores were reported as the estimated energy expenditure in metabolic equivalent-minutes per week (MET-min/wk) as recommended by the IPAQ (2005) scoring protocol. To calculate MET-min/wk, the minutes were multiplied by the number of days and then by the corresponding metabolic equivalent (MET) task, where 1 MET equals the energy expenditure of sitting down quietly (Ainsworth et al., 2000). The following outcome measures were calculated: (a) walking MET-min/wk, (b) moderate MET-min/wk, (c) vigorous MET-min/wk, and (d) a total work MET-min/wk. Table 2 presents the computation of MET-minutes/wk.
Table 2

*Formulas for Computation of Metabolic Equivalent-Minutes in the Job-Related Domain*

<table>
<thead>
<tr>
<th>Intensity</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking MET-min/week</td>
<td>3.3 x walking minutes x walking days at work</td>
</tr>
<tr>
<td>Moderate MET-min/week</td>
<td>4.0 x moderate-intensity activity minutes x moderate intensity days at work</td>
</tr>
<tr>
<td>Vigorous MET-min/week</td>
<td>8.0 x vigorous-intensity activity minutes x vigorous-intensity days at work</td>
</tr>
<tr>
<td>Total Work MET-min/week</td>
<td>Sum of Walking + Moderate + Vigorous MET-minutes/week scores at work</td>
</tr>
</tbody>
</table>

Scores were categorized as low or moderate-high as proposed by the IPAQ-L scoring protocol (IPAQ, 2005). Categorizing scores determined sampling for the qualitative phase (see Table 3 for categorical scoring criteria). The *Guidelines for Data Processing and Analysis of the IPAQ* (2005) recommended that medians and interquartile ranges be calculated for MET-min/week since there were no thresholds or categories for presenting these data.
Table 3

*Physical Activity Categorical Scoring Criteria for the International Physical Activity Questionnaire*

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Does not meet criteria for moderate or high levels</td>
</tr>
<tr>
<td>Moderate-High</td>
<td>• Meets one of the three criteria:</td>
</tr>
<tr>
<td></td>
<td>• Three or more days of vigorous activity of at least 20 minutes per day</td>
</tr>
<tr>
<td></td>
<td>• Five or more days of moderate-intensity activity or walking of at least 30 minutes per day</td>
</tr>
<tr>
<td></td>
<td>• Five or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum of at least 600 MET-min/week</td>
</tr>
<tr>
<td></td>
<td>• Vigorous-intensity activity on at least 3 days achieving a minimum of total physical activity of at least 1500 MET-minutes/week</td>
</tr>
<tr>
<td></td>
<td>• Seven or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum total physical activity of at least 3000 MET-minutes/week</td>
</tr>
</tbody>
</table>

**Qualitative Phase**

*Semi-structured interviews.* Semi-structured individual interviews were used to collect data because using this format allowed the researcher to ask a series of prepared questions but also provided the opportunity to learn more deeply about topics of interest by asking follow-up questions and probing verbally and nonverbally (Cohen & Crabtree, 2006). The interview guide consisted of clear open-ended questions about employees’ perceptions of PA while at school and interventions from research. Open-ended questions allowed the participant to provide the answer he/she felt was most salient (Patton, 2015). Interviews were conducted by the researcher individually either in-person
or via telephone and were audio-recorded. Telephone interviews were thought to result in a loss of rapport due to the absence of visual cues and other nonverbal data; therefore, face-to-face interviews have been considered the gold standard (Novick, 2008). However, a study regarding the validity of in-person and telephone interviews reported both methods were equally as effective for qualitative research (Rahman, 2015). See Appendix D for the interview guide and Appendix E for interview questions shown by SCT component.

**Question set I: School employee physical activity while at school.** The purpose of the first question set was to explore how school employees were physically active during parts of their workday and any barriers and supports of PA they experienced. Example questions included (a) Tell me about times of day when you are purposefully physically active at school; (b) What aspects of the environment support your physical activity at school? Aspects of the environment could mean (i) school setting, (ii) school resources, and (iii) school colleagues; and (c) What personal aspects may allow you to maximize the environmental supports for being physically active at school? Personal aspects could mean (i) personal abilities and values and (ii) personal beliefs.

**Question set II: Perceptions of feasibility of effective school employee physical activity interventions published to date.** The purpose of the second question set was to describe school employees’ perceptions of the feasibility of the most effective school employee PA interventions to date. Only four interventions were discussed in the interviews because they were the only interventions identified by a systematic review of school employee PA programs (Pulling Kuhn et al., 2017). The researcher sent the list of interventions to participants prior to the interviews via email and requested the
participants read the document to become acquainted with the interventions. Following the first question set, the researcher provided the participants with either a hardcopy (if interview was in-person) or asked the participants to look at the list on their computer (if interview was via telephone). In addition, the researcher provided a verbal explanation of the interventions before beginning the second question set (see Appendix F for the list of interventions). School employees were asked questions about barriers and supports to implementing the interventions. Example questions included (a) What aspects of the environment would support you in implementing either a walking or technology-based physical activity program at your school? Aspects of the environment can mean (i) school setting, (ii) school resources, and (iii) school colleagues; and (b) What personal aspects will allow you to maximize the environmental supports for implementing either a walking or technology-based physical activity program at your school? Personal aspects can mean (i) personal abilities and values and (ii) personal beliefs.

Researcher Bias

As a previous employee of a corporate wellness company, this researcher has seen first-hand the importance of well-being, particularly PA, in the workplace. From this experience, this researcher developed a passion for workplace wellness and believe health promotion in the workplace is necessary for healthy and happy workers. Having transitioned from her role in a corporate wellness company to researching school PA, paying particular attention to school employees, this researcher has seen vast differences in the attention and care employees are given in schools versus employees in other occupations. She perceived students to be the priority when it came to health and wellness in schools while employees were often overlooked. Given her experience, she
did not believe corporate wellness programs and interventions could be directly translated and successfully implemented in the school setting. Therefore, this researcher believed there was a critical need to understand how wellness and PA programs that targeted school employee health could fit into the school environment. She acknowledged her experiences working for a corporate wellness company and the passion she had developed as a result were a source of bias. Bias in qualitative research has the potential to distort the data based on the researcher’s interests and prejudices (Patton, 2015). Therefore, it was important for this researcher to reflect on and acknowledge her own biases throughout this study to ensure credibility (Patton, 2015).

**Worldview**

According to Creswell and Plano Clark (2011), multiple worldviews could be used that related to the type of mixed methods design and might change during different phases of a study. For a sequential explanatory design, Creswell and Plano Clark recommended that a postpositivist worldview be used for the quantitative phase and a constructivist view be used for the qualitative phase. Since this study began by using quantitative methods (i.e., a survey) to empirically measure specific variables, a postpositivist worldview was used. Postpositivism is a set of beliefs that guides inquiries based on cause and effect thinking that focuses on a select set of variables to measure or observe (Creswell & Plano Clark, 2011). Once the qualitative phase began, the worldview shifted to constructivism. Constructivism is the idea that knowledge or understanding comes from multiple realities formed by participants’ subjective views (Patton, 2015). The qualitative phase utilized a constructivist world view because this view focused on generating a deeper understanding of employees’ perceptions of PA
while at school (Creswell, 2013). All interpretations made in this mixed method study were subjective and based on participants’ and the researcher’s experiences and knowledge.

**Procedures**

A mixed methods, sequential explanation design was used for data collection. A sequential explanation design involves collecting and analyzing quantitative data followed by collecting and analyzing qualitative data (Creswell & Plano Clark, 2011). Quantitative data included the following information collected from an electronic survey: (a) employee and school demographics and (b) self-report PA data from the job-related domain of the IPAQ (2005). After quantitative data were collected and analyzed, qualitative data were collected from semi-structured interviews with four participants from each group (i.e., four participants in the low PA group and four participants in the moderate-high PA) with a variety of demographics to ensure a range of perspectives (Onwuegbuzie & Collins, 2007). Participant selection for the semi-structured interviews was double-blinded. Qualitative data analyses were performed and then the results from each analysis were connected for the interpretation and exploration of results. Table 4 provides an overview of each step and the associated procedure and product.
### Table 4

**Study Steps, Procedures, and Products**

<table>
<thead>
<tr>
<th>Steps</th>
<th>Procedure</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative data collection</td>
<td>• Web-based survey</td>
<td>• Numeric data</td>
</tr>
<tr>
<td></td>
<td>o Demographics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o IPAQ</td>
<td></td>
</tr>
<tr>
<td>Quantitative data analysis</td>
<td>• Data screening</td>
<td>• Missing data, linearity, homoscedasticity, normality, outliers</td>
</tr>
<tr>
<td></td>
<td>• Frequencies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Spearman’s Rho correlation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Categorical: Mann-Whitney U &amp; Kruskal-Wallis H</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Continuous: Multiple linear regression</td>
<td></td>
</tr>
<tr>
<td>Case selection</td>
<td>• Double-blinded sample</td>
<td>• Total cases (n=8)</td>
</tr>
<tr>
<td></td>
<td>• Purposefully selecting 4 participants per subgroup</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(low PA; moderate-high PA)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>based on stratified sampling</td>
<td></td>
</tr>
<tr>
<td>Qualitative data collection</td>
<td>• Individual semi-structured interviews via phone or in-person</td>
<td>• Interview transcripts</td>
</tr>
<tr>
<td>Qualitative data analysis</td>
<td>• Inductive coding</td>
<td>• Codes, categories, and themes</td>
</tr>
<tr>
<td></td>
<td>• Within and across case analysis</td>
<td></td>
</tr>
<tr>
<td>Integration of quantitative</td>
<td>• Interpretation and exploration of the quantitative and qualitative</td>
<td>• Discussion</td>
</tr>
<tr>
<td>and qualitative results</td>
<td>and qualitative results</td>
<td>• Implications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Future research</td>
</tr>
</tbody>
</table>
Quantitative Phase

After IRB approval was received (see Appendix A), the Qualtrics survey (see Appendices B and C) was sent electronically via email to a total of 2,347 school employees in northern Colorado from one suburban school district \((n = 1751)\) and two rural school districts \((n = 333; n = 263)\). The survey link was sent in an email that included the details of the study (see Appendix G). Respondent consent to participate in the study was given by clicking “Next” to continue to the survey (see Appendix H for consent form embedded in survey). The survey was available through the emailed link for approximately two weeks for each district. After seven days, reminder emails were sent to all school employees (see Appendix I). By using Qualtrics, the researcher had the ability to allow only one survey response per Internet Protocol (IP) address, which reduced the possibility of multiple responses from a single participant.

As survey responses were received, Qualtrics was used to export the data into an Excel worksheet and then into SPSS where scores for the IPAQ (2005) were determined. Once IPAQ scores were determined, school employees were sent recruitment emails (see Appendix J) to participate in the qualitative interviews that occurred after the quantitative data collection and analysis. To obtain a double-blinded sample, a peer-consultant selected school employees from each PA group (i.e., moderate-high and low) for the researcher to contact to participate in the interviews.

Qualitative Phase

Interviews were scheduled via email to take place either via phone \((n = 6)\) or in-person \((n = 2)\) at a participant’s school. An information letter regarding study details and an opportunity for verbal consent were provided before the interview began. Qualitative
data were collected through open-ended questions from semi-structured interviews after the quantitative data collection and analysis was complete. Individual interviews were approximately 45-60 minutes long. The semi-structured interviews included ten questions (see Appendix D), which allowed for additional questions and probing if needed. Interviews were recorded, transcribed, and were followed by the process of member checking to ensure accuracy and validity of data (Merriam & Tisdell, 2016).

**Trustworthiness.** In qualitative research, validity and reliability refer to producing trustworthy results by enhancing the credibility (internal validity), consistency/dependability (reliability), and transferability (generalizability) of the data (Merriam & Tisdell, 2016). For this study, trustworthiness was ensured by (a) member checking, (b) peer debriefing, (c) performing a negative case analysis, and (d) acknowledgment of researcher bias. In this study, member checking methods were utilized by sending a summary of the researcher’s interpretation of each interview with example quotes to each participant (Merriam & Tisdell, 2016). Participants were asked to review the summary and notify the researcher of any changes or additions. None of the participants responded so it was assumed all interpretations were acceptable and no changes were needed. Peer debriefing was applied to obtain feedback on the analysis and involved consulting with a peer-reviewer at each step of the coding process (open, axial, and selective). This process allowed for another perspective and confirmation on the credibility of the findings (Merriam & Tisdell, 2016). For this study, the peer reviewer was a member of the dissertation committee. The peer reviewer examined codes and emerging themes at each step of the coding process to assess if they were representative of example quotes. The peer reviewer also challenged the researcher to think about
which themes held true and were dependable. Discrepancies between the researcher and the peer reviewer were resolved through discussion of original data clips. A negative case analysis was conducted throughout data analysis in which the researcher made note of data that contradicted themes as they developed (Merriam & Tisdell, 2016). This was an on-going process wherein contradicting data were incorporated into the analysis of the data and explained in the interpretation and discussion of the findings. The researcher explained her biases, assumptions, and experiences that could have influenced interpretation of the data. By doing so, the reader might understand how the researcher might have been influenced by her biases, assumptions, and experiences (Merriam & Tisdell, 2016).

School employee physical activity interventions studied in research. The school-based PA interventions for school employees were identified in a systematic review for the employee wellness component of the WSCC model (Pulling Kuhn et al., 2017). Details of the identified interventions were displayed on a one-page document that was emailed to participants prior to the interview and were explained by the researcher before the second question set of the interview. Details of this document included (a) intervention description, (b) school setting characteristics of intervention, (c) length of intervention, and (d) activities of school employees in the intervention. The researcher provided a verbal explanation of the interventions before beginning the second question set (see Appendix F for the intervention handout).
Data Analysis

A mixed methods, sequential explanatory design was used to address the research questions guiding this study. According to Creswell and Plano Clark (2011), a series of six steps should be used to guide the quantitative and qualitative data analyses: (a) preparing the data for analysis, (b) exploring the data, (c) analyzing the data, (d) representing the data, (e) interpreting the results, and (f) validating the data and results.

In the current study, both quantitative and qualitative data were analyzed separately and then connected and discussed. Quantitative data were analyzed using the SPSS (Version 22.0) statistical program and qualitative data were analyzed using NVivo (Version 12.0).

Quantitative Data Analysis: Research Question One

Q1 In what ways do school employees’ PA behaviors while at school vary by employee and school demographics?

Creswell and Plano Clark’s (2011) six step procedure for quantitative data analysis was used for this study.

Step 1: Preparing the data. Participants’ information was kept confidential while utilizing the Qualtrics software. Any identifying information was stored on a password-protected computer in the researcher’s lab and will continue to be for three years after completion of the data collection and then destroyed. The lab was locked when unoccupied and a login name and password were required for computer use.

Before preliminary analyses were run, data were cleaned and coded. Raw data were converted to useful forms of data by (a) assigning participant identification codes and numeric values to all demographic variables after developing a code book and (b) computing scores for the IPAQ (2005). Data entry errors were identified through
frequency tables and corrected by reverting to the original data. Table 5 presents the levels of categorical variables.

Table 5

Levels for Categorical Variables

<table>
<thead>
<tr>
<th>Categorical Variables</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male&lt;br&gt;Female</td>
</tr>
<tr>
<td>Age</td>
<td>Under 30&lt;br&gt;30 to 39&lt;br&gt;40 to 49&lt;br&gt;50 to 59&lt;br&gt;60 and over</td>
</tr>
<tr>
<td>Full-time experience in current position</td>
<td>Less than 3 years&lt;br&gt;3–9 years&lt;br&gt;10–20 years&lt;br&gt;Over 20 years</td>
</tr>
<tr>
<td>Current position</td>
<td>General education teacher&lt;br&gt;Specials teacher&lt;br&gt;Support staff&lt;br&gt;Administration&lt;br&gt;Other</td>
</tr>
<tr>
<td>District SES: Percent of K–12 students in school who are approved for free or reduced-price lunches</td>
<td>Less than 25%&lt;br&gt;25.1 – 50%&lt;br&gt;50.1 – 75.0%&lt;br&gt;Greater than 75%</td>
</tr>
<tr>
<td>District locale</td>
<td>City&lt;br&gt;Suburban&lt;br&gt;Town&lt;br&gt;Rural</td>
</tr>
<tr>
<td>Level of instruction</td>
<td>Elementary&lt;br&gt;Secondary</td>
</tr>
<tr>
<td>Highest degree earned</td>
<td>Less than bachelor’s&lt;br&gt;Bachelor’s&lt;br&gt;Master’s&lt;br&gt;Education specialist or doctor’s</td>
</tr>
<tr>
<td>Presence of employee wellness program</td>
<td>Yes&lt;br&gt;No</td>
</tr>
</tbody>
</table>

*Note*. The source used to identify categories for all listed variables is from the National Center for Educational Statistics (NCES; 2017).
The Guidelines for Data Processing and Analysis of the IPAQ (2005) were followed for data processing (Fan, Lyu, & He, 2014). All duration responses provided were converted to minutes. If data were missing from time or days, the entire case was removed. All cases in which the sum of walking, moderate, and vigorous time variables was greater than 960 minutes were excluded from the analysis, assuming an individual spends eight hours per day sleeping on average. Likewise, all responses of less than 10 minutes were recoded to “zero” since PA bouts of at least 10 minutes are required to achieve health benefits (IPAQ, 2005). Additionally, if a walking, moderate, or vigorous time variable exceeded 180 minutes, it was truncated to equal 180 minutes. This truncation rule permitted a maximum of 21 hours of activity in a week to be reported for each category (Fan, Lyu et al., 2014).

**Step 2: Exploring the data.** Data were screened for assumptions such as normality, linearity, homoscedasticity, collinearity (among continuous independent variables), and visually examined for trends and distributions (Creswell & Plano Clark, 2011; Meyers et al., 2017). The Shapiro-Wilk test was performed to assess normality using a .05 alpha level. Univariate outliers were detected by computing z-scores and deleted if the z-score exceeded ± 2.5 (Meyers et al., 2017). Additionally, multivariate outliers were computed using Mahalanobis distance and were deleted if they exceeded the critical value of 26.125 (Meyers et al., 2017). Linearity was assessed by creating a series of scatterplot matrices on a combination of variables and determined as nonlinear if the scatterplots produced were not oval shaped or elliptical (Meyers et al., 2017). Homoscedasticity was assessed using the Levene’s test of equality of variances. Collinearity was assessed by running a Pearson correlation between the continuous
independent variables of age and years of full-time experience. A preliminary descriptive analysis included computations of medians, interquartile ranges, and correlations.

**Step 3: Analyzing the data.** A variety of statistical tests were used to analyze the data. The SPSS (Version 22.0) statistical program was used for data analysis.

**Preliminary analysis.** To describe employees’ daily PA behaviors while at school, a descriptive statistical analysis was used to compute the medians and interquartile ranges of (a) MET-minutes per week of walking, moderate, vigorous, and total workday PA; and (b) minutes per day in walking, moderate, vigorous, and total workday PA according to participant characteristics (e.g., gender, age, years of experience, highest degree earned, current position, school locale, school SES, level of instruction, presence of employee wellness program). The *Guidelines for Data Processing and Analysis of the IPAQ* (2005) recommended data be reported in both variations for determination of categorical variables (Fan, Lyu et al., 2014). Additionally, the data were reported as medians and interquartile ranges instead of means and standard deviations due to their non-normal distribution (Bowers, House, & Owens, 2002; Habibzadeh, 2013).

**Main analysis.** To determine if employees’ PA behaviors while at school varied by demographic variables, the Mann-Whitney U and Kruskal-Wallis H tests were performed for categorical independent variables and a series of multiple linear regressions were performed for independent continuous variables. The Mann-Whitney U and Kruskal-Wallis H tests were used since the data violated statistical assumptions. Both the Mann-Whitney U and Kruskal-Wallis H tests have been used in statistical analyses with IPAQ data (Bird et al., 2010; Malisova et al., 2014). Mann-Whitney U
tests were used to compare the means of minutes per day in walking, moderate, vigorous, and total workday PA by gender, level of instruction, presence of an employee wellness program, district free/reduced lunch percentage, and district locale since there were two groups for each variable. Although there were four levels of categories according to the NCES (2017) for the variables of district free/reduced lunch percentage and locale (as shown in Table 5 above), the sample in the current study only included two of the categories; therefore, the Mann-Whitney U test was used for these two variables. For the variables of current position and highest degree earned, the Kruskal-Wallis H test was performed to determine if there were statistically significant differences in employees’ PA behaviors since there were three or more groups for each of these variables. If the Kruskal-Wallis test revealed significant results, the Dunn’s multiple comparison post hoc test was performed to compare which groups were significantly different. Dunn’s post hoc test is known as an appropriate procedure following a Kruskal-Wallis test and makes adjustments for multiple testing using a Bonferroni error correction (Dinno, 2015). For the continuous independent variables of age and years of full-time experience, series of multiple linear regressions were performed to identify demographic factors that predicted PA behaviors with an alpha level of .05.

To analyze participants’ descriptions of their employee wellness programs, participants’ open-ended answers were organizationally coded according to the type of wellness their programs targeted. The type of wellness was based on the seven dimensions of wellness, which was the conceptual framework of wellness recommended by the CDC (2016b) to be used in workplace health programs. The seven dimensions
included social, physical, emotional, career, intellectual, environmental, and spiritual. A description of each dimension can be found in Appendix K.

**Steps 4: Representing the data analysis.** Resulting data were represented in text, tables, and figures. Results in text summarized the statistical results of the analysis. Tables were used to display descriptive results, correlations, the Mann-Whitney U test, the Kruskal-Wallis H test, and linear regressions.

**Step 5: Interpreting the results.** The discussion section included data interpretation. To interpret the results, resulting data were compared with the initial research questions to explain how the questions were answered (Creswell & Plano Clark, 2011).

**Step 6: Validating the data and results.** Ensuring the validity of the results involved checking the quality of the data, results, and interpretation. The psychometric properties of each instrument used in the survey were ensured by finding studies that assessed their validity and reliability.

**Qualitative Data Analysis: Research Question Two**

Qualitative data analysis procedures were used to develop a deeper understanding of the following research question:

Q2 What are school employees’ perceptions of the feasibility of effective school employee PA interventions published to date, and in what ways do these perceptions vary by school employee PA behaviors while at school?

Creswell and Plano Clark’s (2011) six step procedures were used for the qualitative analysis.

**Step 1: Preparing the data for analysis.** Interview data were transcribed verbatim using the Temi Transcription Software and analyzed using the NVIVO 12
software. After interviews were transcribed, the researcher double checked them for accuracy. To ensure anonymity of all participants, data were de-identified and replaced with pseudonyms in any report of the findings. To connect the qualitative data with quantitative data, a participant identification code from quantitative data was assigned to associated qualitative data. Any identifying information was stored on a password-protected computer in the researcher’s lab for three years after completion of the data collection and will then be destroyed. The lab was locked when unoccupied and a login name and password were required for computer use.

**Step 2: Exploring the data.** Several readings of the transcripts occurred prior to developing coding categories. After initial readings of the transcripts, a codebook was developed and open coding procedures were performed (Patton, 2015). A codebook aided in the development of themes and during peer debriefing (Creswell & Plano Clark, 2011).

**Step 3: Analyzing the data.** Each participant’s data were analyzed separately to form case analyses and then across groups to find patterns and themes that cut across individual and group experiences. Finally, all participants’ data were analyzed within groups to find patterns and themes that occurred within low- and mod-high PA groups (Patton, 2015). The constant comparison method (Lincoln & Guba, 1985) used the three-step procedures of open, axial, and selective coding to analyze the data individually as well as across and within groups (Strauss & Corbin, 1998). Before the analysis began, all transcripts were read twice and it was determined that data saturation had been achieved since no new additional information was obtained (Merriam & Tisdell, 2016). First, open coding was performed using the NVIVO 12 software to organize and manage the data
The process of open coding involved identifying and assigning meaning to each segment of data that might have supported a category or theme and might be useful in answering the research question. Next, axial coding was performed by collapsing related and unrelated codes to create categories (Patton, 2015). This was done by reviewing the list of open codes and grouping together codes that seemed to fit together. Finally, selective coding was performed by combining and fine-tuning categories to create overall themes. This process involved assigning a theme that captured patterns in the data to codes and categories that were grouped together. The process of open, axial, and selective coding was performed for each case ($N = 8$) and then repeated for the across and within groups analyses by grouping together open codes and categories that seemed to fit together and assigning themes that captured patterns in the data. Additionally, a peer-debriefer was consulted throughout the process to verify the accuracy of the categorization system (Patton, 2015).

**Step 4: Representing the data analysis.** To represent the results, the researcher used specific quotes from participants to support themes. By providing evidence in the form of quotes from multiple perspectives, the researcher attempted to convince the reader the results were accurate (Creswell & Plano Clark, 2011).

**Step 5: Interpreting the results.** In the discussion, an explanation for how the results addressed the research questions was provided. Results were also compared to findings in past research, if applicable. The researcher included her researcher bias and position to show how the researcher made meaning of the data (Creswell & Plano Clark, 2011).
Step 6: Validating the data and results. Trustworthiness and credibility were ensured by (a) member checking, (b) peer debriefing, and (c) performing a negative case analysis.

Connected Data Analysis Comparisons

Connecting the data was used to answer the two primary mixed methods questions: (a) In what ways do employees’ PA behaviors while at school vary by employee and school demographic variables, and (b) What are employees’ perceptions of the feasibility of effective employee PA interventions published to date, and in what ways do these perceptions vary by employee PA behaviors while at school? In a sequential, explanatory mixed methods design, data were connected at the interpretation stage (Creswell & Plano Clark, 2011). A statistics-by-themes joint display compared employees with low PA and moderate-high PA scores by displaying a representative quote for each categorical variable. The joint display showed a row for low PA employees with a representative quote and a row for moderate-high PA employees with a representative quote for each mixed method finding. An example of a statistics-by-theme joint display can be found in Appendix L (Finley et al., 2013). Joint displays are ideal for presenting and comparing quantitative and qualitative findings together (Creswell & Plano Clark, 2011).

To ensure data could be connected, participants of the qualitative phase were purposefully selected from the quantitative phase based on differing PA levels determined by the IPAQ (2005). In doing so, reasons behind different levels of PA while at school were examined (Creswell & Plano Clark, 2011). Another strategy for ensuring connected data was by including a predetermined topic in the qualitative phase based on
quantitative findings (Creswell & Plano Clark, 2011). This helped to ensure the research questions were answered. To interpret the connected results, inferences were made for both the quantitative and qualitative findings separately and then meta-inferences were made that related to how the qualitative and quantitative data provided an understanding of the research problem (Creswell & Plano Clark, 2011). Meta-inferences showed how the connected results answered the research questions (Creswell & Plano Clark, 2011).

**Validity of the Connected Data**

There were a number of potential threats to the validity of the study when connecting data in data collection, analysis, and interpretation (Creswell & Plano Clark, 2011). The following strategies were utilized to avoid compromising validity: (a) the same individuals who participated in the quantitative phase participated in the qualitative phase to ensure quantitative results could be connected and explored with qualitative results, (b) a survey with sound psychometric properties (i.e., IPAQ [2005]) was used to collect data, (c) quantitative and qualitative data sets were connected rather than merged, and (d) data interpretation followed the same sequence as the study design (i.e., quantitative, qualitative, then mixed methods; Creswell & Plano Clark, 2011).
CHAPTER IV

RESULTS

Chapter IV presents the results of the data analyses. The results are organized into two sections: Quantitative data analysis—Research Question One and Qualitative data analysis—Research Question Two.

Quantitative Data Analysis: Research Question One

Data Screening

Before proceeding with the data analysis, all variables were screened with IBM SPSS frequencies, explore, and regression procedures for possible code and statistical assumption violations as well as for missing values and outliers. The Shapiro-Wilks test was performed on a total of 553 cases with complete data. All tests were statistically significant with p-values at exactly .00 for all variables, indicating non-normal distributions. Univariate outliers were detected by computing z-scores and a total of 40 cases were deleted since the z-score exceeded ± 2.5 (Meyers et al., 2017). Additionally, multivariate outliers were computed using Mahalanobis distance and a total of 25 cases were deleted since they exceeded the critical value of 26.125 (Meyers et al., 2017). After removing outliers, normality tests were performed on the final sample of 488 and still resulted in non-normal distributions for all variables with p-values at exactly .00 for all variables. Data transformations on all PA variables were attempted using a Log10 function but the normality tests indicated non-normality with p-values at exactly .00. Linearity was examined by a scatterplot matrix with all physical activity variables and
appeared to depict enough linearity in the relationships of the variables to proceed with the analysis.

Homoscedasticity was assessed using the Levene’s test of equality of variances. Physical activity variables for gender, district free or reduced lunch percent, education level, current position, and presence of employee wellness program were statistically significant ($p < .05$), indicating unequal variances. These violations of homogeneity of variance were likely due to having a non-normal distribution (Meyers et al., 2017). To assess collinearity, a Pearson correlation was run on the independent continuous variables (i.e., age and years of fulltime experience) and revealed a correlation of .44, which was below the recommended threshold of .7; therefore, both variables could be used together in the regression analysis (Meyers et al., 2017). As a result of these assumption violations, nonparametric tests including the Mann-Whitney U and Kruskal-Wallis H tests were performed instead of independent $t$-tests and one-way analysis of variances (Meyers et al., 2017). For the independent continuous variables, multiple linear regressions were used since regression analyses have been found to be adequately robust against assumption violations (Bohrnstedt & Carter, 1971) and have been used in other studies in which IPAQ (2005) data violated assumptions (Bombardier et al., 2012).

**Preliminary Analyses**

Spearman’s rho correlations, medians, and interquartile ranges are shown in Appendix M. All correlations were positive and statistically significant and the strongest correlations were between (a) walking MET/min/wk and total work MET/min/wk ($r_s = .91$) and (b) walking min/day and total work min/day ($r_s = .92$). Overall, participants ($N = 488$) reported a median of 50 minutes of total work PA per day. Participants were
mostly active at a walking intensity (30 minutes/day; 60% of total work PA) or a moderate intensity (10 minutes/day; 20% of total work PA). Since bouts of PA less than 10 minutes in duration were recoded to zero based on IPAQ (2005) data processing guidelines, participants reported a median of zero minutes of vigorous intensity PA.

**Participant characteristics.** Descriptive characteristics of participants are presented in Appendix N. A total of 488 school employees (83% female) participated in the online survey. Most participants worked in elementary schools (53%), had nine years or less years of experience in their current position (71%), and were from a suburban school district (78%). Ages ranged from 22 to 68 years with a mean of 41.39 years. Most participants (67%) were either a general education or specials teacher and were from a school district with 50.1 to 75% of students who qualified for free and reduced lunch (86%). Additionally, 59% of participants had a master’s degree while 7% had less than a bachelor’s degree. Furthermore, 76% of participants had an employee wellness program.

**Physical activity levels.** Descriptive results of the principal study variables (i.e., Vig PA min/day, Mod PA min/day, Walking PA min/day, and Total work PA min/day; Vig PA MET/min/wk, Mod PA MET/min/wk, Walking PA MET/min/wk, Total work PA MET/min/wk) are reported in medians and interquartile ranges across participant characteristics (gender, age, years fulltime in current position, current position, district free or reduced lunch percent, district locale, level of instruction, highest degree earned, and presence of an employee wellness program) in Appendices O and P.

Overall, 84% ($n = 415$) of participants did not meet the national PA recommendations of 150 minutes of moderate to vigorous PA per week while they were
at school (National Physical Activity Plan, 2016; Office of Disease Prevention and Health Promotion, 2018; U.S. Department of Health and Human Services, 2018). Based on IPAQ (2005) categories, 222 participants were in the low PA group, 205 participants were in the moderate PA group, and 61 participants were in the high PA group. Given the unequal separation of groups and national PA guidelines that recommended specific amounts of moderate and vigorous intensities of PA (National Physical Activity Plan, 2016; Office of Disease Prevention and Health Promotion, 2018; U.S. Department of Health and Human Services, 2018), the moderate and high groups were combined for the qualitative phase of the study for a total of 266 participants in the moderate/high PA group.

Main Analyses

**Personal demographic variables.** Of all the personal demographic variables examined (i.e., gender, level of instruction, highest degree earned, current position, years of fulltime experience, and age) gender, current position, and age were found to be statistically significant. Results of the Mann-Whitney U test for gender (see Appendix Q) showed males had significantly higher walking PA min/day ($p = .05$), and total work PA min/day than females ($p = .03$). Results of the Kruskal-Wallis H test for current position (see Appendix R) revealed significant differences in PA levels between current positions for all PA categories: (a) vigorous PA min/day ($p = .04$), (b) moderate PA min/day ($p = .00$), (c) walking PA min/day ($p = .00$), and (d) total work PA min/day ($p = .00$). Dunn’s post hoc tests revealed the following significant group differences: (a) specials teachers had significantly higher moderate PA min/day than general education teachers ($p = .02$) and support staff ($p = .01$), (b) administration had significantly higher levels of walking
PA min/day than support staff ($p = .04$), (c) general education teachers had significantly higher levels of walking PA min/day ($p = .00$) and total work PA min/day ($p = .00$) than support staff, and (d) specials teachers had significantly higher levels of total work PA min/day than support staff ($p = .00$). Although the Kruskal-Wallis test revealed a significant result for vigorous PA min/day, Dunn’s post hoc test showed no significant differences between groups after adjusting for multiple testing using the Bonferroni error correction. Results of the multiple regression analyses for years of fulltime experience and age (see Appendix S) showed age negatively predicted walking ($p = .00$) and total work PA min/day ($p = .00$). For walking PA min/day, the prediction model was statistically significant, $F(2, 485) = 7.958$, $p = .00$, and accounted for approximately 3% of the variance of walking PA min/day ($R^2 = .03$, adjusted $R^2 = .02$) with age primarily predicting walking PA min/day ($\beta = -1.02$). For total work PA min/day, the prediction model was statistically significant, $F(2, 485) = 8.121$, $p = .00$, and also accounted for approximately 3% of the variance of total work PA min/day ($R^2 = .03$, adjusted $R^2 = .02$), with age primarily predicting total work PA min/day ($\beta = -1.19$). There were no significant findings for level of instruction (see Appendix T) or highest degree earned (see Appendix U).

**School/district demographic variables.** Of the school/district demographic variables examined (i.e., district free/reduced lunch percentage, district locale, and presence of an employee wellness program), district locale and presence of an employee wellness program were found to have significant results. Results of the Mann-Whitney U test for district locale (see Appendix V) showed employees in rural school districts reported significantly higher moderate PA min/day than those in suburban districts ($p =$
Results of the Mann-Whitney U test for presence of an employee wellness program (see Appendix W) showed employees who reported having an employee wellness program had significantly higher levels of moderate PA min/day than those who did not have an employee wellness program ($p = .03$). There were no significant findings for district free/reduced lunch percentage (see Appendix X).

Results of the organizational coding process (see Appendix Y) to analyze participants’ descriptions of their employee wellness programs showed most programs were physical wellness programs ($n = 143$), followed by a combination of physical, emotional, career, and spiritual wellness programs ($n = 100$). Sixty-two participants described their programs as providing resources or information to improve their health without an indication of the specific type of wellness, while 51 reported they had an employee wellness program but did not know anything about it.

**Qualitative Results: Research Question Two**

**Across and Within Groups Results**

Analysis of the eight verbatim transcripts generated a total of four overall themes, four subthemes, and two within PA group differences (see Table 6) related to the research question: “What are school employees’ perceptions of the feasibility of effective school employee PA interventions published to date, and in what ways do these perceptions vary by school employee PA behaviors while at school?” Since none of the four themes directly answered the research question related to the feasibility of PA interventions found in published research, a paragraph reporting participants’ perceptions of the walking and technology-based programs is at the end of the qualitative results section. The process to organize and analyze the data across and within groups also resulted in
case analyses for each participant (see Appendix Z). There were more across groups themes than within and if there were within groups themes, they were displayed when applicable and embedded in the across groups themes in the following results section.

Table 6

*Themes, Subthemes, and Within Physical Activity Group Differences*

<table>
<thead>
<tr>
<th>Theme</th>
<th>Subtheme</th>
<th>Within PA group differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recognized importance of PA</td>
<td>• Through personal beliefs</td>
<td>Low PA participants lacked a wellness committee/program and coworker support</td>
</tr>
<tr>
<td></td>
<td>• Through personal behaviors</td>
<td></td>
</tr>
<tr>
<td>Presence of PA support system</td>
<td></td>
<td>Low PA participants thought of ways to overcome barriers to PA, whereas mod-high PA participants did not believe barriers could be overcome</td>
</tr>
<tr>
<td>Overcoming barriers</td>
<td>• Facilitative strategies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Implementation skills</td>
<td></td>
</tr>
</tbody>
</table>

**Theme 1: Lack of time.** The prominent barrier to PA at school presented by all participants was a lack of time before, during, and after the school day. Participants described not having enough time due to having “full schedules” and prioritizing other responsibilities in their “life and work.” Some of these priorities included (a) academic pressures to ensure students performed well on standardized tests, (b) family activities happening before and after school, (c) before and after school committee meetings, and
Likewise, participants mentioned prioritizing their work responsibilities during school hours rather than being physically active so they could leave school at the end of the day. Melissa (low PA) described district rules that restricted employees from being physically active during contract hours and having lunch periods that were too short to fit in PA. Denise (mod-high PA) believed the schedule at a secondary school did not permit employee PA during the school day: “I can't give up 20 minutes of 55 minutes of instructional time to just go take a walk.” Kacey (mod-high PA) mentioned that being physically active with her students could be more of a time constraint if students lost focus. Additionally, Ian (low PA) mentioned not wanting to sweat in work clothes and not having time to change or shower as a barrier to PA during the school day.

In addition, three participants (66% low PA; 66% non-teachers) believed there was a need for someone else in their school to plan and implement an employee PA program because they did not personally have the time. Ben (low PA) expressed that he would participate in an employee PA program if someone else took on the responsibility of planning or implementing it: “I would love to have this going on in my school if somebody else was running it and then I could participate in it.” Likewise, Miles (mod-high PA) also positively perceived an employee PA program but believed no one in his school would have time to plan and implement it: “It's all positive the way I would see it, but who's got the time to do it?” Ian (low PA) also expressed that he would not have the time to plan and implement an employee PA program but identified the PE teacher or coaches as viable leaders: “If it was brought up to the PE teachers or the athletic coaches they might really like it and want to do more.”
Although there were no differences by PA groups for the theme of lack of time, there were differences by job type. Interestingly, participants who were not teachers (n = 3; i.e., the campus monitor, counselor, and instructional coach) expressed that because they did not have set schedules, it was more difficult for them to find personal time (e.g., a planning period) during the day to be physically active. For example, the campus monitor expressed that his job forced him to always be available to respond to events (e.g., fights, security issues) and did not allow any personal time during the school day. He expressed,

I have to be available…if a fight breaks out here I got to be able to respond and get that taken care of…So it’s not like I can say, okay, I’m going to go lift weights and don’t bother me for an hour. It doesn’t work that way. I have to be able to respond. (Matthew, mod-high PA)

The counselor (mod-high PA) also felt that since his counseling sessions ran longer than expected at times, he was not always able to stay on schedule and said there were always students for him to see: “Even if I have a blank schedule, I have a running list of kids that I can see.” The instructional coach (low PA) also expressed that becoming an instructional coach after being a teacher for 13 years provided him with less personal time during the school day so being physically active was even more challenging for him in a job not as a teacher:

So last year I was an English teacher and had been for 13 years. The schedule actually made it a bit easier because there were certain periods of time where it was designated as personal time…. In the job I now hold, there is no designated downtime for me and there’s a lot more people who are seeking me out for all
sorts of things. So having personal downtime to do pretty much anything, is something I have to be pretty intentional about setting aside during the school day. (Ben, low PA)

Overall, the first theme illustrated all participants perceived a lack of time as a barrier to their PA at school. Data revealed a lack of time was due to having other responsibilities in and outside of work. It was apparent non-teacher participants perceived a greater degree of lack of time compared to teachers due to the nature of their jobs and not having a planning period.

Theme 2: Recognized importance of physical activity. All but one participant (mod-high PA; non-teacher participant) expressed personal values regarding PA. Two subthemes emerged regarding how participants expressed his/her values of PA: (a) through personal beliefs and (b) through personal behaviors.

Personal beliefs. Many participants recognized the importance of PA by expressing personal beliefs about PA for their personal health. Participants felt PA was good for their physical health and contributed to living “a healthier lifestyle.” For example, Daisy (low PA) stated: “We should treat it [our bodies] like we’re a Lamborghini, and not a junker.” Denise’s (mod-high PA) beliefs about the importance of PA stemmed from feeling better when active, whereas Ben (low PA) mentioned having religious beliefs that encouraged him to take care of his health. Although, Ben (low PA) described himself as “generally sedentary,” he wanted to be “intentional” about improving his health by being more physically active for his future quality of life: “But I’m also 43 and so I recognize that my health in terms of how I eat and how I exercise is
going to have a significant impact on my future quality of life…and that becomes increasingly truer the older I get.

Likewise, participants perceived PA to be good for their mental health and felt they were in a “better mood,” more “grateful,” “positive,” and able to “give more to others” if able to be physically active. Participants also believed PA was good for their work-related health as they perceived it to make them more “productive” and “function better.” For example, Denise (mod-high PA) perceived herself to be a better teacher and expressed not feeling as exhausted if she was able to be physically active during the school day: “I do often feel exhausted because I don’t get enough physical activity during the day. And I wish there was some way to schedule it in.” Ian (low PA) also expressed valuing PA so he could continue being an engaged teacher. For example, he said, “I just don’t want to be a teacher that can’t get bend down and play with the kids or work with them, interact with them. I still want to be able to go into PE and be able to play tag with them.”

Six of the eight participants also recognized the importance of PA for others (i.e., students, coworkers, and parents) in the school. Five participants expressed the importance of PA for students. Both teachers and non-teachers felt students might perform better academically after they were physically active. For instance, when Kacey’s (mod-high PA) students asked her why they had to do a brain break, she would tell them: “…Because it’s good for your brain and it’s going to help your brain work better.” Likewise, Miles (mod-high PA; counselor) actively advocated for classroom teachers to provide PA breaks for students because he believed it helped them academically. Participants also felt modeling and talking about PA with students was
important for instilling healthy habits at a young age. For example, Denise (mod-high PA) stated, “I think that it’s a good example for my students.” Three participants (66.6% low PA) expressed the importance of PA for employees in schools. For example, Kacey (mod-high PA) felt that being physically active with others in the school would help teachers to feel less isolated:

You have to take time to talk and be with other people too. And I think sometimes this is pretty isolating. People get to their classroom or they stay in their classroom and they don’t branch out….when the kids are with us, you’re kind of stuck. But then even when the kids aren’t here, I think people kind of just stay in their own little world. And so we’re trying to break down some of those barriers, and say, “Hey, let’s go eat lunch outside and then…why don’t we take a short walk?”

Likewise, Melissa (low PA) also felt PA provided social time during the school day. Daisy (low PA) expressed wanting to “get teachers more active and just aware…of a healthier lifestyle and that it’s not some big strenuous path, that it can be just as simple as walking.” Only one participant (mod-high PA) believed it was important to get parents involved in and supportive of school-wide PA for the sake of student PA. For example, Kacey stated, “It’s my belief that, that sometimes we try to do it all at school, but that we need the parents to join in…Because if the parents are saying it, and we’re saying it then hopefully the kids will realize this is important.”

Likewise, only one participant (mod-high PA) expressed valuing PA for his family and wanted his children to be active with him. For example, when talking about
his PA values, Miles (mod-high PA) stated, “Those ideologies are still important to me and I want to pass those on to my children.”

**Personal behaviors.** The second subtheme was participants’ recognition of the importance of PA by describing their own PA behaviors with others in their school. Five of the eight participants explained how they were physically active with their students and with other co-workers at their school. Teachers expressed being active with their students by joining physical education, performing classroom PA breaks (e.g., Go Noodle), participating in an after-school run club, playing catch during recess, and choreographing and performing dances with students. Likewise, the counselor said he often took students for walking breaks or played games (e.g., soccer) with them during counseling sessions. Four of the five participants (75% low PA) also described how they were active with their co-workers while at school. These activities included (a) going on “walk and talks” with other teachers at lunchtime in the surrounding neighborhood, (b) performing after-school “Crossfit” and yoga with other school employees, and (c) walking hallways with teachers before after-school committee meetings. Likewise, two participants participated in their school’s wellness committee initiatives including a holiday weight challenge.

The remaining three participants (66% mod-high PA) did not describe being physically active with others during school. Ben (low PA; instructional coach) described himself as “generally sedentary” and was not active while at school. Matthew (mod-high PA; campus monitor) described his PA while at school but it was not with anyone else or due to personal beliefs about PA. He described his PA as being work-related and included walking the halls, helping custodians, delivering mail, and lifting boxes. Denise
(mod-high PA; teacher) did not describe PA during the school day by herself or with others but did express she was sometimes active with coworkers before school by swimming at the school pool.

To summarize, the second theme showed participants recognized the importance of PA by stating their beliefs and values about PA for themselves, students, coworkers, parents, and families. This recognition of the importance of PA was reinforced by most participants’ descriptions of their PA behaviors with their students and coworkers while at school.

**Theme 3: Physical activity support system.** All participants described having some type of environmental supports for being physically active at school. These supports were in the form of district or school wellness committees and programs (including the presence of PA initiatives), on-campus facilities for PA, administrative support, and coworker support. Two participants described district wellness committees that provided employee wellness resources, health fairs, step challenges, mindfulness activities, and incentives for participation. Three participants described school wellness committees that promoted healthy lifestyles for students and employees by implementing step challenges or by providing healthier food and snacks in the teachers’ lounge. Six participants already had PA initiatives for employees at their school including after-school yoga classes and during school walking breaks. Six participants described facilities on the school campus that could be used for PA such as weight rooms or pools; however, their use was sometimes limited due to student use during and after school. While two participants expressed having administrative support for employee wellness initiatives, four participants (50% low PA and 50% mod-high PA) expressed needing
administrative support for (a) permission to implement activities and (b) to make PA part of the school culture. Daisy (low PA) found coworker support was in the form of not only participation but also planning and implementing. For example, she said, “There are some that are going to support it just by simply doing that [participating], there's others that are going to want to plan it with us, there's others who are going to want to send out the messages.” Alternatively, she also found some coworkers were not supportive. For example, she said, “I know some colleagues, they are like okay, whatever healthy lifestyle, do it if you want to, I'm not going to. And so they're not very supportive of what we're trying to do in the school.” Participants perceived their coworkers valued PA and thought they would be receptive to an employee PA program. For example, Matthew (mod-high PA) said, “You just put it out there for them. And like I said, those that are into that will do it and maybe others will see the benefit and join in.” Kacey (mod-high PA) also perceived her coworkers to be encouraging about health and receptive to wellness committee initiatives. She also said they were often times physically active together on the weekends: “Yeah, I would say a lot of our staff is very active and they'll invite others to join them, but a lot of those activities are outside of school, not within the school day.” Denise (mod-high PA) believed the social support from her coworkers helped her to be physically active while at school: “And it always helps if I have colleagues or people around me that value the same thing, that there's somebody to do it with or just to support me to encourage me to get it done. And I do have that…my close coworkers very much support that.”

Likewise, Ian (low PA) thought having social support provided accountability for being active: “It’s easier when you have a support group. So when there’s ten of us that
do Crossfit twice a week…if you don’t show up, it’s like ‘where were you?’” He also expressed he liked the social aspect of doing Crossfit with coworkers after school when he said, “Misery loves company.”

**Mod-high versus low physical activity groups.** All participants in the mod-high PA group had supports for being active at their school. However, 50% of the low PA group expressed needing social support in the form of an improved school wellness committee or program and coworker support. Although both acknowledged the presence of a school wellness committee, one committee was focused only on student wellness while the other committee was only focused on keeping up the school garden. Additionally, participants expressed a lack of coworker support for employee PA at their school and wanting more.

One participant perceived his coworkers were not concerned about health while at work. For example, Ben (low PA) said, “It’s not like people are anti health or something, but, the focus of work while we’re at work is doing the work. The idea of being healthy at work or exercising while you're at work is not something that's necessarily talked about a whole lot.” Ben (low PA) thought that developing a “culture of health” at his school was the key to obtaining more coworker support. He also thought an employee PA program should have a social aspect and would need to be sustained for many years in order to create a culture of health:

If you were able to get it sustained…then when you have new people coming into the building two or three years down the road, this is a piece of the culture that already exists in the building…it's just something that we do. And so that would
be a natural way to pull people into that more. The trick is trying to change the culture in the first place.

Likewise, Melissa (low PA) described having coworkers who were active but not while at school. She also expressed she used to have an after-school exercise program with a few coworkers the year before but her coworkers stopped participating so the program no longer existed. Melissa wanted to be physically active while at school with other coworkers because she did not want to be active by herself and was a self-described “social person.” She, like Ben, thought that making an employee PA program a social activity would get more people to participate and provide “accountability.” For example, she said, “I think sometimes that social aspect of having someone else that’s supporting you, doing it as you’re doing it too, I think that is a motivator for a lot of people. It keeps me accountable if I know that I’d have someone waiting for me.”

In summary, this theme showed that having a PA support system in place was important for participants’ PA while at school. The support system identified by all mod-high PA participants included the presence of district and school wellness programs/committees, on-campus PA facilities, administrative support, and coworker support. Administrative support was perceived by most participants as needed for obtaining permission and making PA a part of the school culture. Only low PA participants expressed a specific need for social support in the form of improved school wellness committees/programs and coworker support. Coworker support could be in many forms such as (a) coworkers who participated, planned, or implemented PA/wellness initiatives; (b) coworkers who valued health and were receptive to wellness
initiatives, or (c) coworkers who provided social support and accountability for being active at school.

**Theme 4: Overcoming barriers.** Six of the eight participants expressed ways to overcome barriers through the following two subthemes: (aa) facilitative strategies (66.6% low PA), or (b) skills for implementation (75% low PA). Facilitative strategies included ideas on how to overcome barriers in the school environment. Skills for implementation were personal abilities or characteristics participants felt helped them overcome barriers related to PA in the school environment.

*Facilitative strategies.* Four participants (50% low PA) thought of ideas or strategies for overcoming barriers such as lack of time to implement the walking or tech-based PA programs. Some of these were logistical strategies such as implementing a walking program over lunch time or implementing school-wide brain breaks that both students and teachers could perform together instead of implementing a walking or tech-based PA program. For example, Ian (low PA) said, “Maybe if it was school wide…Here's activities…and exercises that you can do in the classroom or out on recess that is good for the kids and good for the staff members.” Two participants (50% low PA) mentioned implementing a PA policy for employees to make PA mandatory for both students and teachers. Counting steps without walking all together at school was also mentioned as a strategy for overcoming the time barrier but the PA would not be performed with other employees. Additionally, applying for funding to purchase incentives was expressed as a strategy to get more participation.

When discussing how the tech-program could be implemented in Daisy’s (low PA) school, she mentioned that using a cell phone application would be easy to
implement since her school was in a Google district. She also mentioned a cell phone application that sent reminders to be physically active could build community among the staff and get the outside community involved as well. Daisy said, “I think it'd be a good community aspect of, hey, what other parents are in your neighborhood? Go take a walk and two families or something like that.” She also thought a cell phone application could be ideal for employees who did not want to hand out their phone number or did not check their email. Likewise, Denise (mod-high PA) thought there were ways to implement the walking program in her school setting. She mentioned walking during planning periods and using the school building and town as the “track” for a walking program:

    It's a very small town, very low traffic. So you can just walk around town. We can come up with some kind of a track. Plus our campus is spread over a couple of different blocks so you can even walk from one building to another building on campus. And we have a two story school. So, in inclement weather…you could go up the stairs, down the hallway, down the stairs, make a loop.

    Additionally, Ian (low PA) thought that communication or “word of mouth” or talking with people was an important strategy for getting other people to participate in his school’s PA initiatives or to volunteer. He mentioned that sending emails and texts allowed him to get volunteers and did not take valuable time away from others: “I'll usually send emails trying to get more people to show up or, word of mouth…just putting that bug in people's ears to show up and come do this with us. Misery loves company.”

Last, Kacey (mod-high PA) thought seeing other coworkers be successful at improving their health could prompt more participation and believed that sharing how PA had
positively impacted her life and health could influence others to participate in an employee PA program.

**Skills for implementation.** Four teachers (75% low PA) mentioned personal abilities or characteristics they perceived enabled them to overcome barriers to be physically active while at school. First, Melissa (low PA) believed her creative problem-solving skills allowed her to start walking during the school day with some of her coworkers by using their personal plan time and bringing tennis shoes to school:

We knew that we couldn't walk on our plan time and we couldn't walk right after school when the day was over. So instead we took our own personal time during lunch and we walked during lunch instead. So we have come up with some creative ways of being able to do at least some walking here at school. We all have our tennis shoes here and we just change into our shoes the last five minutes of reading class and take the kids outside for their lunch and recess and then we walk and then we go eat.

Melissa provided another example of her creative problem solving by getting her principal to reinstate recess by showing him the research on the benefits of recess for students: “He (principal) doesn't like it to call be called recess, but we gave him the research that kids need vitamin D to help their brains think. So we call it vitamin D breaks. I told you we had to be very creative on how we got things done.” During the interview, she also came up with the idea of showing her principal the research on the benefits of employee PA to gain support for an employee PA program.

Daisy (low PA) expressed three qualities she perceived to help her overcome barriers in her school related to implementing employee wellness initiatives. First she
thought her ability to plan ahead (a) allowed she and the wellness committee to commit to attending their meetings, (b) helped the wellness committee secure enough funding to cover all employee wellness initiatives for the year ahead, and (c) helped her remember tasks to perform when implementing employee wellness initiatives. Likewise, Denise (mod-high PA) also expressed her ability to plan allowed her to be physically active. Daisy (low PA) said that not being afraid to ask questions or for help enabled her to implement employee wellness initiatives. For example, she was able to get prizes donated from the local Subway for incentives when funding was limited. She also mentioned that remaining positive and staying excited was vital to implementing and sustaining employee wellness initiatives:

If we're excited about it, more people are going to get excited about it just because we're excited. And they're like “Why are you so excited? Let's see what this is all about.” And then just keeping that going, keeping it interesting and exciting the whole time through, not just petering out halfway through kind of thing.

Last, Ian (low PA) thought participation in PA while at school was based on internal motivation to be healthy: “It’s just motivation. If you want to be healthy then you’ll try to find ways to work out.” Likewise, he said, “If you don't make a point of it, you're not going to be very active. You can choose to sit all day here at school if you want to…so it's just kind of a personal preference.” Ian believed that being active while at school was possible and was up to the individual to find a way to do it.

**Mod-high versus low physical activity groups.** All participants in the low PA group expressed facilitative strategies and/or skills for implementation to overcome barriers in their school to implement an employee PA program while at school.
However, only one participant in the mod-high PA group expressed skills for implementation (Denise; teacher) and only one expressed facilitative strategies (Kacey; teacher). The remaining two non-teacher participants in the mod-high PA group did not mention any facilitative strategies or skills for implementation to implement during school PA for employees. Miles (mod-high PA; counselor) thought that during school PA for employees was completely “unrealistic” and it would be unethical for him to leave his job to be physically active while at work: “In order for that to be able to happen it would border on if not flat out be a dereliction of duty, unethical practices.” He also said that since he was already physically active at home, he did not need an employee PA program at school. Miles thought employee PA initiatives should occur before or after school or on the weekends and allow employees to track their PA using technology and provide the option to be active with others:

Well organize the walk and say, “On Saturday we're going to go up Lory state park. Those of you that can make it would love to have you… The group is walking a couple of days a week after school for 20 minutes or half hour, or bike riding together to promote the social part of exercise.” And meanwhile, stressing that “If you can't be there, make sure to do it on your own and track it.”

Additionally, Matthew (mod-high PA; campus monitor) did not believe there was any way to overcome the barrier of time to be physically active during the school day because he had to be able to respond to random events at any given time. He expressed he did not believe he had any personal abilities, values, or beliefs that would allow him to maximize supports for being physically active. For example, when asked about personal abilities, values or beliefs for maximizing supports, he said, “I don’t know that there is
any.” Matthew also expressed that he did not believe personal beliefs had anything to do with his PA but that it was simply the nature of his work that posed a barrier to PA: “It’s not personal beliefs or anything like that, it’s just work.”

Overall, this theme showed the low PA group had more beliefs related to overcoming barriers than did the mod-high PA group. Facilitative strategies included alternative times to implement PA during the school day, sharing beliefs about PA, implementing school-wide brain breaks for students and staff, mandating a PA policy for students and employees, applying for funding for incentives, using a cell phone application, and communicating via “word of mouth,” email, or text. Skills for implementation included creative problem solving, the ability to plan, not being afraid to ask questions, not being afraid to ask for help, and having internal motivation to be active and healthy. For the most part, the mod-high PA group suggested employee PA while at school was unrealistic and no personal abilities, values, or beliefs could allow employee PA to occur while at school.

**Perceptions of Walking and Technology-Based Programs**

Participants’ perceptions of the walking and technology-based programs revealed no clear consensus around which PA program would work better or was more feasible in their schools. One participant (Ben, low PA) believed any of the four programs could work in his school setting: “I can imagine them working…any one of them depending upon the details of how it was put together.” Otherwise, the majority of participants discussed specific supports and barriers to either the walking or technology-based programs.
Walking programs. Three participants discussed the implementation of as well as barriers and supports for a walking program. Daisy (low PA) mentioned that a walking and technology-program could be implemented together and could involve the surrounding community as well as employees: “I think it'd be a good community aspect of, ‘Hey, what other parents are in your neighborhood? Go take a walk with other families’ or something like that.” Ben (low PA) mentioned supports in his school for the walking program such as space:

The physical stuff that you would need to do them is present…we have a field around the school. It’s not particularly beautiful or interesting, but it certainly would provide space…and even just walking around the block or something…there’s a place for doing that kind of work.

Ian also thought implementing a walking program with both students and employees would be feasible in his school but it would have to be before or after school: “So doing a walking program with the students and staff, I think you probably could do. I don't know if you could find the time during school, maybe before school or after school you could.” He also thought a walking program would work well if it only involved counting steps and did not require space or time: “If you're just counting your steps throughout the day, I don't see it affecting the time that much, as long as you don't have to allocate space and time after school.”

Technology-based programs. All participants discussed supports and barriers to having a technology-based PA program in their school. Three participants (66.6% mod-high PA) perceived that having access to technology while at school was a support to a technology-based program. For example, Ben (low PA) said, “So everybody has a
computer while they’re at school…so being able to access that…wouldn’t be a problem.” Denise believed a technology-based program eliminated barriers such as time and space: “I think that the technology based program has very limited amount of barriers because you're not requesting a setting, you're not requesting, a scheduled time…. It has the most flexibility.” Likewise, Miles (mod-high PA) suggested having a technology-based program would allow him to be active on his own time (before or after school) and still participate in group competitions or challenges: “So if it was technology-based, I wouldn’t have to be here…to go to this walking/running group and I could get my exercise in during my own time.” Daisy (low PA) expressed that a technology-based program using a cell phone application would work best in her school because it would allow for confidentiality for those who did not want to hand out their phone number and would work for employees who did not check their emails.

Two participants expressed that poor cell phone coverage or internet access would be a common barrier to a technology-based program (50% mod-high PA). Melissa also expressed the following barriers: (a) not having the same kind of PA tracker (e.g., Fitbit), (b) a lack of technology or technology that did not work, and (c) not knowing how to use the technology: “So for me to set that all up… I don’t even know what I’m doing here. Like I can’t because I’m old, I don’t know how to do this.” Daisy (low PA) mentioned a technology-based program could frustrate employees by sending too many notifications. Likewise, Ian (low PA) thought a tech program could be considered a “chore.” For example, he said,

It just kind of depends on how often people would want to check in. It might just seem like more of a chore, but as much time as people are on Facebook and social
media, that just gives them one other thing to do while they're looking at their phones.

Kacey (mod-high PA) also thought employees might get distracted by technology:

I would say the barriers for that one is I think they would get too distracted by all the other things that they should be doing on their phone or their computer and that… any program encouragement would probably just be shoved aside so they could get to something else.

Finally, Denise (mod-high PA) believed a technology-based program might result in less participation due to a lack of accountability: “I think less people would be inclined to stick with it if they didn't have the support of each other. So if you weren't doing something during the school day where your colleagues could be a support to you, I think participation might be less.”
CHAPTER V

DISCUSSION AND CONCLUSIONS

This chapter is divided into the following sections: (a) summary of interpretation of the quantitative, qualitative, and mixed methods results; (b) limitations and future directions; (c) practical implications; and (d) conclusions.

Summary of Interpretation of the Quantitative, Qualitative, and Mixed Methods Data

The following sections discuss the current study’s findings across each type of data: (a) quantitative findings, (b) qualitative findings, and (c) mixed methods findings.

Quantitative Findings

Quantitative analyses generated data that described employee PA behaviors and determined demographic variables (i.e., personal and school/district) where school employee PA behaviors varied. The quantitative findings are organized into three main categories: (a) school employee PA behaviors, (b) personal demographic variables, and (c) school/district demographic variables.

School employee physical activity behaviors. Overall, the quantitative data revealed school employees were more physically active at a walking or moderate intensity than at a vigorous intensity. These findings were consistent with previous research on the physical activity levels of Flemish secondary school teachers that found teachers were mostly active at a walking or moderate intensity while at school (Bogaert et al., 2015). This finding could suggest school employees need more opportunities to be...
physically active at higher intensities while at school in order to meet national PA guidelines (U.S. Department of Health and Human Services, 2018). However, previous research has shown that not obtaining more vigorous intensities of PA while at school could be due to wanting to remain comfortable in one’s professional work clothing (i.e., not sweating; Bogaert et al., 2015). Since national PA guidelines could be met by obtaining only moderate intensity activity (i.e., 150 minutes per week; U.S. Department of Health and Human Services, 2018), perhaps school employee interventions should focus on providing moderate intensity activities rather than more vigorous ones. Research has shown that both vigorous and moderate intensity activities have beneficial effects for the prevention of chronic diseases (Mayer-Davis et al., 1998); therefore, moderate-intensity PA might represent a feasible intervention.

**Personal demographic variables.** The current study found males were more active than females, which was consistent with findings of another study that found male teachers were more active than their female counterparts (Bogaert et al., 2015). This finding was not surprising as it was also in line with population surveillance data that found males were more active than females (Guthold, Stevens, Riley, & Bull, 2018; Hallal, Anderson, Bull, Guthold, & Haskell, 2012). This could be due to biological gender differences that favor males in PA (e.g., more muscle mass; Miller, MacDougall, Tarnopolsky, & Sale, 1993), different reasons to be active (e.g., weight loss versus enjoyment; Craft, Carroll, & Lustyk, 2014), or female gender role expectations (i.e., caretaking; Verhoef, Love, & Rose, 1992). Likewise, the finding that school employee PA while at school declined with age was also in line with previous literature showing PA levels declined as individuals got older and the decline in PA was due to the aging
process (i.e., reduced muscular strength, flexibility, agility, endurance, and increased body fat percentage; Milanović et al., 2013). These findings suggested it might be useful to thoughtfully consider or tailor school employee PA interventions based on demographic variables (Segar, Jayaratne, Hanlon, & Richardson, 2002).

Differences in participants’ PA according to their current position showed administrators had higher levels of walking PA than did support staff; specials teachers had higher levels of moderate intensity PA than general education teachers and support staff; general education teachers had higher levels of walking and total work PA than support staff; and specials teachers had higher levels of total work PA than did support staff. The finding that administrators were more active than support staff might not be surprising considering the multiple duties of a principal that include tasks such as hiring, personnel evaluation, budget management, curriculum development, dealing with discipline issues, and engaging with students (Rayfield & Diamantes, 2004). According to these findings, support staff seemed to be the least active of these positions. Since the term “support staff” could encompass so many different positions such as counselors or office staff, it was difficult to pinpoint the reason for this finding, especially since studies examining school employee PA generally focused on teacher PA (Bogaert et al., 2015; Webber et al., 2012) rather than other positions. The finding that specials teachers had higher levels of moderate PA than general education teachers coincided with the findings from Bogaert et al.’s study (2015), which found teachers who taught practical courses (e.g., physical education or art) were more active than those who taught theoretical courses (e.g., mathematics); however, the underlying reasons were unclear. Likewise, another study found physical education (PE) teachers had significantly higher levels of
PA than general education teachers and attributed this finding to PE teachers’ higher values of PA outcomes as measured by a survey (Breslin et al., 2012). Since the current study did not ask participants to specify what kind of specials teacher they were, it was unknown if the difference could be due to PE teachers’ PA values. As such, this particular finding could suggest teaching a specials class placed more physical demands on specials teachers than general education teachers. Perhaps the nature of the subject area (e.g., teaching physical activities in physical education), a larger class size (average of 19 students in specials versus 16.6 students in self-contained classes across all grade levels, and the organizational structure involving several rotating classes of different students throughout the day influenced specials teachers’ movement. If this was the case, schools could consider restructuring general education classrooms so general education teachers obtain more PA throughout the workday. This could be done by altering the classroom-built environment to include standing desks, exercise balls, bean bags, or mats, which have been effective at reducing sitting time and increasing standing time in children (Hinckson et al., 2016; Silva et al., 2018). Perhaps these built environment changes could have an impact on school employee PA as well. Furthermore, the Physical Activity Design Guidelines for School Architecture (Brittin et al., 2015) could be referred to as a tool for strategies on how to increase PA by altering the school environment, specifically classroom furniture specifications (i.e., using dynamic and flexible furniture that allows movement and changes for group versus individual work) or other domains. However, we must be cautious in doing so since increased physical demands could lead to higher levels of burnout in teachers (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003).
No differences were found in PA by level of instruction, highest degree earned, or years of full-time experience. The findings for level of instruction did not coincide with findings from student level PA interventions that have illuminated many challenges with implementing PA opportunities for secondary level students (Institute of Medicine, 2013). Nevertheless, secondary interventions should continue to be implemented and seek to include employees in PA interventions. A lack of findings for highest degree earned was surprising given that, in general, a higher education level has been associated with higher PA levels (Sweegers et al., 2019) and vice versa. It was important to recognize that only recently a growing number of teacher education programs are restructuring their programs to include education on program planning for health-related interventions (i.e., CSPAP) focused on improving student health (Castelli et al., 2017). Perhaps universities need to take a similar approach and include education to pre-service teachers on program planning for health-related interventions focused on school employees’ health outcomes. Likewise, providing professional development on health-related interventions to in-service teachers is equally as important as one study found more experienced teachers (>20 years) reported higher levels of the work engagement aspect of vigor after participating in a yearlong CSPAP leader professional development program (Pulling Kuhn, Carson, Beighle, & Castelli, in preparation). Although this was contrary to the current study, which found no significant results for years of full-time experience, continuing to provide CSPAP professional development for in-service teachers with a focus on teacher interventions could be important for improving their work-related health.
School/district demographic variables. Participants in rural school districts were more active than those in suburban districts. Although this finding was not in accordance with most literature showing rural residents were less active than their urban counterparts (Fan, Wen, & Kowaleski-Jones, 2014), it was in line with another study that found rural residents were more likely to be very active (Forbes et al., 2019). This contrary finding could be due to the methodology used (i.e., subjective rather than objective PA measures; Fan, Wen et al., 2014); therefore, further work should be conducted to determine if there are differences in PA levels based on measures used. It was also important to note the current study only examined job-related PA as opposed to overall PA, which is what the aforementioned studies examined (Fan, Wen et al., 2014). Another possible explanation for this was teachers in rural schools are often asked to take on extra work and assume many different roles, which is contrary to their suburban and urban counterparts (Hammer, Hughes, McClure, Reeves, & Salgado, 2005), resulting in higher PA levels. Therefore, there could be health implications related to having additional duties; however, this must be approached with caution since higher burnout levels have been found among rural teachers (Varela et al., 2018; Zhang et al., 2014).

Participants who had an employee wellness program were more active than those without. These results were in line with a study that showed meeting national PA recommendations while performing work-related tasks was significantly associated with access to PA breaks, walking maps at work, stair prompts, worksite-supported exercise programs, indoor exercise facilities at work, and using flextime for PA (Hipp et al., 2017). In line with these findings, participants of the current study described some of the same components of their school’s employee wellness program such as the availability of
an exercise room. Overall, these findings suggested a worksite wellness program could potentially be applied to the school setting to help school employees meet national PA recommendations (U.S. Department of Health and Human Services, 2018). More research is warranted to translate worksite wellness programs to the school setting.

Participants’ descriptions of their employee wellness programs showed most programs targeted physical wellness (40%) and involved activities such as step challenges, before school PA, or monthly exercise calendars. This was in line with qualitative data that showed walking was a common activity for employees in schools whether it was with their students or coworkers. Walking was also generally perceived as a feasible intervention based on interview data. Unfortunately, the systematic review (Pulling Kuhn et al., 2018) limited the interview questions to only concern walking and technology-based programs, which could have guided participants’ responses. The second most commonly described employee wellness programs targeted physical wellness and at least one other type of wellness (28%; i.e., emotional, spiritual, or career). Perhaps future research could use these findings to determine if there are more innovative, yet feasible approaches to school employee wellness interventions.

No differences were found between employee PA levels according to their district free/reduced lunch percentage. Although PA and SES have not been studied in school employees, there have been studies to examine employees’ overall health related to SES that found working in low-income school neighborhoods was associated with teachers’ ill health (Virtanen et al., 2010). Alternatively, a dearth of literature focused on student PA showed low SES schools had less school-wide PA opportunities and less time spent in MVPA than high SES schools (Carlson et al., 2014; Van Dyke, Cheung, Franks, &
Gazmararian, 2018). A lack of literature to compare this finding could be explained by a study that proposed research pertaining to school PA be focused on student PA rather than employee PA (LeCheminant, Merrill, & Masterson, 2017). Therefore, more research is needed to study demographic variables that might impact school employee PA such as SES.

**Qualitative Findings**

Qualitative analyses generated data that described school employees’ perceptions of the feasibility of school employee PA interventions found to be effective in published research. The qualitative findings are organized by two overarching themes: (a) lack of time and (b) recognized importance of PA. The two remaining themes are discussed in the mixed methods section.

**Lack of time.** Qualitative data indicated lack of time was a barrier to PA while at school. Participants felt having to fulfill the responsibilities of their jobs and ensuring students performed well on standardized tests inhibited them from being physically active during the school day. This finding was consistent with the study examining Flemish teachers’ PA levels who expressed that making time for PA would be challenging during the school day (Bogaert et al., 2015). Lack of time was generally a ubiquitous barrier to physical activity at the population level (Herazo-Beltrán et al., 2017) as well as other health-related endeavors such as weight management efforts (Aboueid, Nur, Pouliot, Bourgeault, & Giroux, 2019) or implementing PA opportunities for students (Carson et al., under review). For teachers, a lack of time was a common stressor due to having too many responsibilities (Richards, 2011) and the pressure of high-stakes testing (Gonzalez, Peters, Orange, & Grigsby, 2016). However, this study found a lack of time was a
common barrier to PA across all types of school employees; therefore, it is vital for practitioners and researchers to develop strategies to overcome this barrier. Although no differences were found within groups related to this theme, the finding that support staff participants perceived themselves to have even less time to be physically active than teacher participants was unique since other studies examining school employee PA had not examined employees’ perceptions of PA while at school across different PA levels (Bogaert et al., 2015; Webber et al., 2012). This finding could suggest support staff participants might deal with certain situations or demands unique to their jobs that could make time management more difficult. However, having support staff as more than one quarter (37%) of the qualitative sample could be considered a limitation since it was not reflective of the diverse sample from the quantitative phase of the study. Perhaps future qualitative research examining school employee PA should include perspectives from a variety of positions such as administrators as well as specials teachers.

**Recognized importance of physical activity.** Qualitative results revealed certain beliefs participants had toward PA while at school. Overall, participants believed PA was important for their physical, mental, and work-related health regardless of the PA group. Participants felt PA while at school was good for all school employees because it provided social support and kept others from being isolated. This finding coincided with qualitative results from the Flemish teachers study (Bogaert et al., 2015) in which teachers expressed that PA while at school was good for comradery and “team-building.” Some participants also felt being physically active helped them be better at their jobs and was a way to help them function better while at work. These results were in line with previous studies that found (a) childcare teachers’ workplace and leisure-time PAs were
negatively related to aspects of their work-related health (i.e., emotional exhaustion, absenteeism, and turnover; Carson et al., 2010), and (b) physical and cognitive rejuvenation strategies were reported by childcare teachers as most effective for stress relief while at work (Carson et al., 2016). Taken together, the results of these studies supported the notion that PA interventions should be implemented during working hours for school employees. Additionally, given the plethora of social/emotional interventions identified by the employee wellness systematic review (Pulling Kuhn et al., 2018), it could be argued school employee wellness programs should include interventions that combine PA and social/emotional interventions (e.g., walking meditation; Carson et al., 2016).

**Perceptions of the walking and technology-based programs.** The qualitative data revealed no specific answer to the research question: “What are school employees’ perceptions of the feasibility of effective school employee PA interventions published to date, and in what ways do these perceptions vary by school employee PA behaviors while at school?” Overall, participants discussed barriers and supports to the walking and technology-based programs but there was no pattern in the data to determine which of the programs might have worked better in their schools. This lack of findings could have been due to the challenge of keeping participants on topic and focused on discussing supports and barriers to the specific programs. The researcher often prompted participants to talk about specific programs but participants tended to talk about supports and barriers to their general PA at school rather than to specific PA programs. As such, challenges with staying on topic and building on participant responses was found to be a common issue with novice qualitative researchers or students (Hoskins & White, 2013).
Also, participants discussed more barriers and supports to the technology-based programs than the walking programs. This could be due to three participants already having designated walking programs (formal or informal) with other employees at their schools. Perhaps participants were intrigued by the technology-based program since it seemed like a new idea or not commonly implemented and therefore discussed it more.

**Mixed Methods Findings**

Quantitative and qualitative analyses generated data that described school employees’ perceptions of the feasibility of school employee PA interventions found to be effective in published research. The mixed methods findings are organized by the two remaining qualitative themes connected to the quantitative findings: (a) presence of PA support system and (b) overcoming barriers.

**Presence of physical activity support system.** Overall, both the quantitative and qualitative data supported the notion that having a PA support system in the form of wellness committees and programs, on-campus PA facilities, administrative support, and coworker support was important for employee PA while at school (see Appendix AA for joint display of connected data). These findings were in line with the CSPAP conceptual framework (Carson et al., 2014), which explained that multiple types of supports exist in the school environment that underly CSPAP implementation such as (a) leadership from administration, a CSPAP champion, and a CSPAP committee; (b) program components in which PA opportunities are provided; and (c) resources including facilities, or physical/built environment structures. The finding that administrative support was needed was in line with the study on Flemish teachers’ PA (Bogaert et al., 2015) in which a barrier to PA was lack of support from school management. Administrative support
was known to influence student PA opportunities and was thought to be required for successful CSPAP implementation (Carson & Webster, 2019; Centeio et al., 2014; Jones et al., 2014). Related to this were recommendations for building a support system for implementing CSPAPs that included (a) a PA champion who coordinated all school PA initiatives; (b) a supportive administrator who valued PA, helped with PA program development, and built community connections; and (c) a CSPAP committee comprised of diverse members of the school community who contributed to decision-making regarding CSPAP implementation and evaluation (Carson & Webster, 2019). School-level support systems such as these have led to successful CSPAP implementation (Deslatte & Carson, 2014; Jones et al., 2014). However, CSPAPs tend to focus on student PA; therefore, school leaders should consider forming school-level teams aimed at increasing PA.

Additionally, the finding that low PA participants lacked social support could suggest school employees without wellness committees or coworker support had a more difficult time attaining PA while at school. Although these participants had other kinds of supports, such as a weight room on-campus or a holiday weight loss challenge, they still expressed needing social supports in the form of a wellness committee and coworker support. These results could be explained by a worksite wellness study (Dodson et al., 2018) that found having only one worksite support (e.g., PA initiatives/challenges or PA breaks) did not increase the odds of employees being physically active but certain combinations of multiple worksite supports did increase the odds of employees being physically active (e.g., health fairs, flex time for PA, PA challenges, availability of showers, outdoor facilities, exercise programs, bike storage, etc.). This finding could
suggest school employees need a PA support system with more than one type of support (beyond an employee wellness program) and perhaps a certain combination of supports from administration, coworkers, a wellness committee, and physical/built environment structures. More research is warranted to examine the types and optimal combinations of PA supports necessary for employee PA in the school environment.

**Overcoming barriers.** Participants in the low PA group described facilitative strategies and implementation skills to overcome barriers to PA while at school. On the contrary, participants in the mod-high PA group did not express many ways to overcome barriers and two of them (non-teachers) believed PA while at school was not possible. Differences between participants’ perceptions could be attributed to (a) the sampling strategy used that resulted in an unequal number of participants who had employee wellness programs and (b) high activity levels of participants in the mod-high PA group, which could have resulted in a perception that there was no need to overcome barriers since they were already active.

A secondary analysis performed with the quantitative data determined all low PA participants had employee wellness programs. On the contrary, of the mod-high PA participants, one did not have an employee wellness program while the remaining three had programs but two (non-teachers) had no knowledge of their program and had never participated in it. This was an unexpected finding as it was contrary to literature showing school employees who had an employee wellness program had better health behaviors (i.e., PA, healthy eating) compared with the control group that lacked an employee wellness program. This finding was suggestive of challenges associated with stratified sampling in mixed methods research in which the range of variation in a sample must be
known and anticipated at the outset of a study (Palinkas et al., 2015). For the qualitative phase of this study, variations between the participants who had an employee wellness program and those who did not were unanticipated and could have contributed to this contrary finding.

Another explanation for this finding was the participants in the mod-high PA group were already active so they did not feel the need to think of ways to overcome barriers (see Appendix BB for joint display of connected data). These participants described ways they were physically active during the school day as part of their jobs (e.g., campus monitor who walked hallways, counselor who took students on walks as part of sessions, teachers who participated in PE or walked with students). This finding could suggest they were already physically active because PA was already a part of their jobs. Likewise, research suggested employee wellness programs that had the greatest potential for influencing PA behaviors promoted incidental PA within and around the workplace rather than a more structured approach (Marshall, 2004). Therefore, schools should consider ways to create more PA opportunities for teachers that are fluidly ingrained in their job tasks. More research is needed to determine the most effective ways to ingrain PA into the school day (Erwin, Brusseau, Carson, Hodge, & Kang, 2018).

Limitations and Future Directions

This study was not without limitations. The IPAQ (2005) is based on recall and could have resulted in an inaccurate perception of the intensity and duration of the activities performed. These perceptions could have resulted in an over- or under-reporting of PA (Vandelanotte et al., 2005) since teaching is only a moderately intense activity (2.3 Metabolic Equivalent of Task of METs; Ainsworth et al., 2000). Since
school health promotion research has tended to focus on students rather than teachers (LeCheminant et al., 2017), future research should focus more on school employee health and use more objective measures to further investigate school employee PA. The results of this work could be used to establish guidelines for employee health in schools similar to the CSPAP model for student health. These guidelines could include recommendations for elements of a PA support system and education/training programs on health-related behaviors in schools for pre- and in-service teachers.

Furthermore, only eight interviews were conducted for the qualitative phase of the study. Therefore, more in-depth qualitative research using a purposeful sampling strategy (Patton, 2015) that includes multiple interviews per participant, site visits, observations, and collection of artifacts should be conducted to inform optimal types, amounts, and combination of PA supports school employees need to be active. Additionally, the current study only gained perspectives from teachers and support staff; therefore, future work should examine different types of school employees since most of the current literature focused on teachers (Bogaert et al., 2015; Carson et al., 2010, 2016; Webber et al., 2012).

**Practical Implications**

The current study has the following implications for practice for school employee wellness:

- Worksite wellness programs should be applied to school settings to help school employees meet national PA recommendations (U.S. Department of Health and Human Services, 2018). Higher intensity PA opportunities should be provided to employees since this study showed that most of their
activity was at a walking intensity. Low PA participants need to become active and mod-high PA participants need to attain higher intensities of PA. By providing higher intensity PA opportunities, school employees might be more likely to meet national PA recommendations.

- Schools should find ways to naturally ingrain more PA into the daily work lives of teachers through unforced feasible actions such as active staff meetings or active supervision on the playground (Bogaert et al., 2015; Erwin et al., 2018).

- Schools should provide a PA support system that includes (a) social support from administration, coworkers, and wellness committees (Carson et al., 2014); (b) the presence of an employee wellness program (e.g., health fairs, PA challenges; Dodson et al., 2018); (c) changes or additions to the school built environment such as classroom furniture that allows movement (Brittin et al., 2015); and (d) the availability of showers, outdoor facilities, or bike storage (Dodson et al., 2018).

- Pre-service and in-service teacher education programs should require teachers to take classes on program planning for health-related interventions focused on employee health outcomes and how to manage their own health-related behaviors in schools (Carson et al., 2010; Carson & Webster, 2019; Institute of Medicine, 2013). Additional education and training could enhance employees’ awareness of the value of PA (Bogaert et al., 2015).

- Since PA interventions could have a positive impact on numerous aspects of health (i.e., beyond physical health), school employee wellness programs
should combine social emotional interventions with PA interventions (Carson et al., 2016). A broadened intervention approach could have implications for the daily health and wellness of school employees and also attract more interest from participants, which could expand the longevity of the programs.

**Conclusions**

Currently, research in the area of school employee health and PA remains relatively untouched. Guided by social cognitive theory, this study revealed how school employees’ PA behaviors varied by (a) personal and district/school demographic variables; (b) the presence and types of PA supports in their school environment; and (c) values, abilities, and beliefs about overcoming barriers to PA. Overall, findings from this study showed school employees were interested in and valued PA but faced challenges with being active while at work. Researchers might consider exploring (a) how to incorporate higher intensity PA opportunities throughout the school day; (b) ways to enhance PA behaviors of participants in different demographic categories (i.e., gender, age, current position, rural locations); (c) ways to provide education/training for pre- and in-service teachers on school employee health; (d) the optimal PA support system for school employee PA; and (e) the effects of a broadened intervention approach on school employee health. Increasing PA opportunities of employees at school could help relieve job stress and burnout (Austin, Shah, & Muncer, 2005; Carson et al., 2016), and contribute to the multicomponent implementation of a CSPAP.
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doi.org/10.1097/JOM.0000000000000153


doi:10.2147/CIA.S44112


doi.org/10.1111/j.1746-1561.2008.00344.x


APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL
DATE: February 11, 2019

TO: Ann Kuhn, M.S.
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1324064-3] A Mixed Methods Study of Teacher Physical Activity, Classroom-Based Physical Activity Integration and Perceptions of School Employee Physical Activity Interventions

SUBMISSION TYPE: Amendment/Modification

ACTION: MODIFICATION APPROVAL/VERIFICATION OF EXEMPT STATUS

DECISION DATE: February 11, 2019
EXPIRATION DATE: October 1, 2022

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB approves this project modification and verifies its status as EXEMPT according to federal IRB regulations.

Ann -

Thank you for the clear and thorough amendments to your IRB application. These are approved for use as you proceed with this research.

Best wishes with participant recruitment and data collection. Don't hesitate to contact me with any IRB-related questions or concerns.

Sincerely,

Dr. Megan Stallino, UNC IRB Co-Chair

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or nicole.morse@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.
APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE
Demographic Questions

1. What is the name of your school district?

2. What is the name of your school?

3. What is your current age? _______

4. Gender:
   - Female
   - Male

5. How many years have you been full-time in your current position? _______

6. What is your level of education?
   - Less than bachelor’s
   - Bachelor’s
   - Master’s
   - Education specialist or doctor’s

7. What is your level of instruction?
   - Elementary (Grades K-6)
   - Secondary (Grades 7-12)

8. What is your current position (check one)?
   - General education teacher (e.g., english, mathematics, science)
   - Specials (e.g., Art/music, PE, ESL/bilingual, special education)
   - Support staff (e.g., office staff, nurse, counselor, intervention teacher)
   - Administration
   - Other_____  

9. Does your school have an employee wellness program?
   - Yes
   - No

      If so, describe the program(s): __________

To obtain your gift card, please answer the last two questions:

10. What is your name? _______

11. What is your email address?
APPENDIX C

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE
INTERNATIONAL PA QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The following questions will ask you about the time you spent being physically active while at school (e.g., classroom physical activity with students, or school employee wellness initiatives) during a typical work week (i.e., excluding holiday breaks). This does not include traveling to and from work. Please answer each question even if you do not consider yourself to be an active person.

Think about all the vigorous and moderate activities that you did while at school during a typical work week (i.e., excluding holiday breaks). Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal.

1. During a typical work week, on how many days did you do vigorous physical activities like heavy lifting, digging, heavy construction, or climbing up stairs as part of your work? Think about only those physical activities that you did for at least 10 minutes at a time.

   o 1 day per week
   o 2 days per week
   o 3 days per week
   o 4 days per week
   o 5 days per week
   o No vigorous job-related PA   Skip to question 3

2. How much time did you usually spend on one of those days doing vigorous physical activities as part of your work?

   _____ minutes per day

3. Again, think about only those physical activities that you did for at least 10 minutes at a time. During a typical work week, on how many days did you do moderate physical activities like carrying light loads as part of your work? Please do not include walking.

   o 1 day per week
   o 2 days per week
   o 3 days per week
   o 4 days per week
   o 5 days per week
   o No moderate job-related PA   Skip to question 5
4. How much time did you usually spend on one of those days doing **moderate**
   physical activities **as part of your work**?

   _____ minutes per day

5. During a typical work week, on how many days did you walk for at least 10
   minutes at a time **as part of your work**? Please do not count any walking you did to
   travel to or from work.

   o 1 day per week
   o 2 days per week
   o 3 days per week
   o 4 days per week
   o 5 days per week
   o No job-related walking

   → **Skip question 6**

6. How much time did you usually spend on one of those days **walking as part of
   your work**?

   _____ minutes per day
APPENDIX D

INTERVIEW GUIDE
Interview guide

Date: ____________  Time: ____________

Equipment Needs: Digital recorder, batteries, copies of interventions

Set-up:
• Digital recorder-check batteries

Introduction:
Hello, my name is Ann Kuhn and I am a PhD student at the University of Northern Colorado. Thank you for participating in the interview today. The goal is to learn more about your physical activity during the school day. During the second half of the focus group you will be provided with a list of employee physical activity interventions that have been tested in schools. I would like to get your thoughts on the feasibility of implementing those interventions in your school. This interview will take approximately 45-60 minutes of your time. There is a small risk of a breach of confidentiality, but all efforts will be made to keep what you say in the strictest confidentiality. I will not link your name to anything you say in the text of any publications. Please be as honest as possible in this discussion and do not just say what you think I might want to hear. Because I am recording this discussion I ask that you speak clearly. Participation is voluntary. If, at any time, you want to skip a question, take a break, turn off the recorders, terminate the interview, or withdraw from the study, without penalty, just ask. If you have any additional questions concerning this research or your participation in it, please feel free to contact me at any time. I would like to record our discussion, so that I can have an accurate record of the information that you provide me. I will transcribe the recordings and keep the transcripts securely in my possession. Do you have any questions about this research? Do you agree to participate?
**Research question**

**RQ1:** In what ways do employees’ PA behaviors while at school vary by employee and school demographics?

**Interview questions**

**Question Set I: Employee PA while at school**

**Description of PA (Behavior):**

- Tell me about times of day when you are purposefully physically active at school.
- How are you physically active during that time?
- What aspects of the environment support your physical activity at school? Aspects of the environment can mean:
  - School setting
  - School resources
  - School colleagues
- What aspects of the environment pose barriers to your physical activity at school? Aspects of the environment can mean:
  - School setting
  - School resources
  - School colleagues

For each specific support or barrier mentioned, the following questions will be asked:

- What personal aspects may allow you to maximize the environmental supports for being physically active at school? Personal aspects can mean:
  - Personal abilities and values
  - Personal beliefs
- What personal aspects may allow you to overcome the environmental barriers to physical activity at school? Elaborate. Personal aspects can mean:
  - Personal abilities and values
  - Personal beliefs

**Preamble to question set II:** Now let’s shift our focus to the document on school employee PA programs that have been tested in research. [Hand out one-page document or ask participant to look at document on computer]. I’d like to take a moment to explain the programs before discussing them and provide an opportunity for you to ask any clarifying questions you may have about them.

The first two programs on the left side of the document are walking programs that occurred in elementary schools. The first one took place during school on a walking trail on school property and included all school employees with a schedule that permitted everyone to participate during working hours. This program also included incentives for meeting monthly goals and parent...
volunteers to help with tracking laps around the trail. The second walking program took place after school on the playground and involved teachers walking at a moderate pace for 30 minutes three times per week.

The two programs on the right side of the page were technology-based interventions. The top right program was a website-based program that generated a tailored physical activity program and advice after participants completed a physical activity questionnaire. Teachers were emailed with follow-up emails to further encourage their physical activity participation. The bottom right program prompted teachers via SMS messaging about exercise benefits on alternate days of the week for 6 weeks. Teachers were also provided with pedometers for physical activity tracking and information leaflets about local walking trails and facilities for being active. Physical activity promoting posters were also hung around the school.

Now let’s take some time to discuss implementing these interventions in your school. Specifically, what supports and barriers exist in your school, and how you could use the supports and overcome barriers to implement the interventions.

<table>
<thead>
<tr>
<th>RQ2: What are employees’ perceptions of the feasibility of effective school employee PA interventions published to date, and in what ways do these perceptions vary by employee PA behaviors while at school?</th>
<th>Question Set II: Perceptions of feasibility of PA interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>What aspects of the environment would support you in implementing either a walking or technology-based physical activity program at your school? Aspects of the environment can mean:</td>
<td></td>
</tr>
<tr>
<td>School setting</td>
<td>School setting</td>
</tr>
<tr>
<td>School resources</td>
<td>School resources</td>
</tr>
<tr>
<td>School colleagues</td>
<td>School colleagues</td>
</tr>
<tr>
<td>What aspects of the environment would be barriers to implementing either a walking or technology-based physical activity program at your school? Aspects of the environment can mean:</td>
<td></td>
</tr>
<tr>
<td>School setting</td>
<td>School setting</td>
</tr>
<tr>
<td>School resources</td>
<td>School resources</td>
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<tr>
<td>School colleagues</td>
<td>School colleagues</td>
</tr>
<tr>
<td>For each specific support or barrier mentioned, the following questions will be asked:</td>
<td></td>
</tr>
<tr>
<td>What personal aspects will allow you to maximize the environmental supports for implementing either a walking or technology-based physical activity program at your school? Elaborate. Personal aspects can mean:</td>
<td></td>
</tr>
<tr>
<td>Personal abilities and values</td>
<td></td>
</tr>
<tr>
<td>Personal beliefs</td>
<td></td>
</tr>
</tbody>
</table>
What personal aspects will allow you to overcome the environmental barriers for implementing either a walking or technology-based physical activity program at your school? Elaborate. Personal aspects can mean:

- Personal abilities and values
- Personal beliefs
APPENDIX E

INTERVIEW QUESTIONS BY SOCIAL COGNITIVE THEORY COMPONENT
<table>
<thead>
<tr>
<th>Interview Questions by SCT Component</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Behavior</strong></td>
</tr>
<tr>
<td>WHAT: Tell me about times of day when you are purposefully physically active at school.</td>
</tr>
<tr>
<td>HOW: How are you physically active?</td>
</tr>
<tr>
<td>Environment</td>
</tr>
<tr>
<td>WHY: What aspects of the environment support your physical activity at school? Aspects of the environment can mean: School setting School resources School colleagues</td>
</tr>
<tr>
<td>WHY: What aspects of the environment pose barriers to your physical activity at school? Aspects of the environment can mean: School setting School resources School colleagues</td>
</tr>
<tr>
<td>Cognitive</td>
</tr>
<tr>
<td>WHY: What personal aspects may allow you to maximize the environmental supports for being physically activity at school? Elaborate. Personal aspects can mean: Personal abilities and values Personal beliefs</td>
</tr>
<tr>
<td>WHY: What personal aspects may allow you to overcome the environmental barriers to physical activity at school? Elaborate. Personal aspects can mean: Personal abilities and values Personal beliefs</td>
</tr>
</tbody>
</table>

RQ1: Understanding employee PA behaviors

RQ2: Feasibility of PA interventions
Probing categories based on the CSPAP conceptual framework (Carson et al., 2014):

**Environment:**
- School setting: space, equipment facilities, built environment, safety, presence of EW program
- School resources: tools, incentives, financial support, time
- School colleagues: wellness champion, wellness committee, supportive administrator, normative behaviors & beliefs

**Cognitive:**
- Personal capacity and values (stated in interview as personal abilities and values): knowledge, skills, attitude
- Personal beliefs: ability to overcome barriers/maximize supports

**Probing Questions:**
- *Detailed-oriented probes* – who, where, what, when, and how?
- *Elaboration probes* – Tell me more about that. A bit more detail?
- *Clarification probes* – I want to understand, what do you mean by?
- *Contrast probes* – How does x compare with y?
APPENDIX F

LIST OF INTERVENTIONS
List of Interventions

SCHOOL-BASED EMPLOYEE PHYSICAL ACTIVITY PROGRAMS

WALKING PROGRAM
Participants were classroom teachers from elementary schools in China.

The walking program took place after school on the school playground or in school hallways in the case of inclement weather. Teachers walked at a moderate intensity for 30 minutes per day for three times per week for 12 weeks.

WALKING PROGRAM
Participants were employees from an elementary school in the U.S.

The 5-month walking program took place during school hours on a walking trail on school property. All employees were given time during working hours to participate with at least two time slots available per day. Teachers had the option of walking with their students. Physical activity was tracked using laminated punch cards and parent volunteers to keep track of completed laps around the trail.

WEBSITE-BASED PHYSICAL ACTIVITY PROGRAM
Participants were school employees from primary and secondary schools in Belgium.

The 8-week website-based program generated a tailored physical activity program and advice after participants completed an online physical activity questionnaire. Weekly emails were sent to further encourage physical activity.

TECHNOLOGY-BASED PHYSICAL ACTIVITY PROGRAM
Participants were elementary school teachers in Hong Kong.

The 6-week program included:
- SMS messaging to remind teachers of benefits of exercise twice per week
- Optional daily physical activity tracking using pedometers
- Advertising walking trails and facilities for being active
- Hanging physical activity-promoting posters around schools
APPENDIX G

EMAIL INVITATION TO TAKE SURVEY
Hello!

My name is Ann Kuhn and I am a Doctoral Candidate at the University of Northern Colorado. I am conducting a research study in partial fulfillment of the requirements for my degree of Doctor of philosophy. You are invited to participate in a research study regarding school employee wellness.

I am seeking your participation in a five-minute online survey (link below). There is an incentive of a twenty-dollar gift card for the first five people, the last person, and every tenth person in between to complete the survey. Additionally, I am seeking at least four participants for a follow-up interview for which there will be an incentive of a twenty-five dollar gift card.

If you have concerns or questions about this study, please contact Ann Kuhn at ann.kuhn@unco.edu.

To begin the survey, click on the following link:

When you enter the survey, you will first read the informed consent and then continue on with the survey should you decide to participate. I hope you participate in my study, as it is important to improving employee wellbeing practices in schools.

Thank you for your time,

Ann Kuhn
APPENDIX H

INFORMED CONSENT FOR PARTICIPATION
IN RESEARCH
Informed Consent for Participation in Research
Project Title: Exploring school employee physical activity behaviors and perceptions

In 2014, the Association for Supervision and Curriculum Development (ASCD) and Centers for Disease Control (CDC) expanded the eight-component comprehensive school health model to the ten-component Whole School, Whole Community, Whole Child (WSCC) model. One of the ten components, employee wellness, recognizes schools as a worksite where employees’ physical and mental health can be fostered by implementing a coordinated set of programs, policies, and benefits that support healthy eating, physical activity (PA), stress management, and a safe work environment. Although employee wellness programs target many aspects of health, the focus of this study is school employee physical activity.

Currently, most school physical activity research focuses on students rather than school employees. Therefore, I am looking for participants to help me understand school employee physical activity behaviors and perceptions.

If you grant permission and willingness to participate, I ask you to complete a one-time survey regarding your school demographics and physical activity behavior. The survey will take approximately 5 minutes to complete.

In the first section of the survey questions, you will be asked demographic questions pertaining to your school and professional experience, however your name will not appear in any professional report of this research. The researcher may follow up with you for a follow-up interview regarding school employee physical activity. Only the researcher will look through the survey results.

I foresee little to no risks to participants. You will not directly benefit from participation in this study, but findings will be used to help inform school employee wellness research. There will be an incentive of a $20.00 gift card for the first five people, the last person, and every tenth person in between for completing the survey. After completion of the survey, your results will be assigned a numeric identifier to ensure confidentiality.

Participation in this study is entirely voluntary. Once participation begins you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled.

If you have any concerns about being a research participant, please contact Sherry May, IRB administrator, in the Office of Research, Kepner Hall, University of Northern Colorado, Greeley, CO 80639; 970-351-1910.

By clicking on the next button below you are agreeing to be part of this study.

Researcher contact information
Ann Kuhn, M.S.
School of Sport and Exercise Science
Ann.kuhn@unc.edu
APPENDIX I

FOLLOW-UP EMAIL TO PARTICIPANTS
Hello!

This is a follow-up email regarding an email I sent approximately a week ago requesting you to participate in my research study. I hope that you have had time to complete the survey. If you have not had time this is a reminder that the survey will close in two weeks. There is an incentive of a twenty-dollar gift card for the first five people, the last person, and every tenth person in between to complete the survey. The link to the survey is below. I also included the previous email for reference.

To begin the survey, click on the following link:

When you enter the survey, you will first read the informed consent and then continue on with the survey should you decide to participate. I hope you participate in my study, as it is important to improving employee wellbeing practices in schools.

If you have concerns of questions about this study, please contact Ann Kuhn at ann.kuhn@unco.edu.

Thank you for your time,

Ann Kuhn
APPENDIX J

EMAIL INVITATION TO PARTICIPATE IN INTERVIEWS
Hello!

This is a follow-up email regarding the survey that you completed for my research study. As part of the study, I would like to invite you to take part in one 45-60 minute interview because you meet the criteria to be included in the interview portion of the study. An incentive will be provided to all participants in the form of a $25.00 gift card.

Interview questions will follow-up on the answers you provided in the initial survey. They will also ask questions about the feasibility of school employee physical activity interventions. I hope you participate, as the study is important to improving employee wellbeing in schools.

If you have concerns or questions about this study, please contact Ann Kuhn at ann.kuhn@unco.edu.

Thank you for your time,

Ann Kuhn
APPENDIX K

THE SEVEN DIMENSIONS OF WELLNESS
The Seven Dimensions of Wellness (CDC, 2016b)

1. **Social wellness**: the process of creating and maintaining healthy friendships and relationships at work through engaging and connecting with coworkers. This type of initiative can involve activities that bring coworkers together for group lunches or other events.

2. **Physical wellness**: the process of creating and maintaining healthy and fit bodies through healthy habits such as exercise, nutrition, and sleep. This type of initiative can involve before/after work exercise programs or physical activity breaks.

3. **Emotional wellness**: the process of creating and maintaining mental health by talking about and expressing feelings, accepting self-worth, and maintaining a positive self-concept. This type of initiative can involve stress management programs or promoting mental health support programs.

4. **Career wellness**: the process of creating and maintaining a feeling of fulfillment with one’s job and career path by practicing work-life balance, staying current in one’s field, and creating a healthy organizational climate. This type of initiative can involve work-life balance seminars or providing incentives for practicing healthy behaviors in the workplace.

5. **Intellectual wellness**: the process of creating and maintaining the desire to learn and apply new concepts, improve skill sets, and seek new challenges. This type of initiative can involve professional development classes or providing resources to allow employees to expand their knowledge.

6. **Environmental wellness**: the process of contributing to the protection of the environment and protecting individuals from environmental hazards by always considering air, water, and land quality. This type of initiative can involve providing filtered water, regular maintenance to air filters, or access to natural resources (e.g., plants, natural light) in the workplace.

7. **Spiritual wellness**: the process of discovering meaning and purpose in life and demonstrating one’s values through behaviors. This type of initiative can involve establishing policies that foster diversity and culture, or offering quiet rooms where employees can practice mindfulness, meditation, or prayer.
APPENDIX L

EXAMPLE OF A JOINT DISPLAY FOR SEQUENTIAL EXPLANATORY DESIGNS
Example of a Joint Display for Sequential Explanatory Designs

**Rich communication (theoretical framework)**

Communication through face-to-face conversation; most effective when messages are unclear or ambiguous (qualitative theme)

| Low WRS score clinics | “I think that some days we should just sit down and say, ‘Okay, this is what’s going on. What do you know—how do you perceive this is supposed to be done?’ …[S]ometimes the hurdles that we run into are just, they could have been easily avoided if there had been a little bit better communication.” |
| High WRS score clinics | “Well, you know we have what’s called huddle every morning and any problems from the day before are discussed in huddle with all the team members and the clerical staff, social workers, the pharmacist. So we all get to know anything that’s going on at that time.” |

**Heedful interrelating**

Individuals are attentive to their work tasks and sensitive to how their roles and actions affect and intersect with those around them

| Low WRS score clinics | “…[T]here’s a whole lot of tension and a lot of it has to do with, ‘That ain’t my job and you’re messing in my area and you don’t belong in my area and you need to back out and just stay in your own business.’” |
| High WRS score clinics | “I think the teamwork here is just excellent. You know we really pitch in and try and help. Everyone’s attitude basically is that if one person’s working hard, we’re all working hard.” |

**Trust**

Individuals feel safe in making themselves vulnerable to others

| Low WRS score clinics | “Some people are probably not going to verbalize a lot, because they’re afraid it might get back to their boss or… because they don’t want to rock the boat.” |
| High WRS score clinics | “So, I have learned so much about medicine itself from these people; they’re wonderful…I’m not afraid to approach them for whatever the patient needs, because the goal is to provide the best and safest patient care.” |

**Respectful interaction**

Honest, appreciative, and self-confident interaction between individuals

| Low WRS score clinics | “That’s one of the things that kind of has me down on the clinic, just lack of communication, for coordination, lack of respect in my opinion, professionalism, and so, and your opinion about things, how things should run.” |
| High WRS score clinics | “The camaraderie among the team members, among the teams, among the different disciplines, that we work so cohesively together. So, ideal.” |

**Mindfulness**

Demonstrating openness to diverse ideas and perspectives

| Low WRS score clinics | “…I don’t even make suggestions anymore. I mean, you get tired after a while. I mean, you know, you really want to make a difference, but it doesn’t go anywhere and people get tired and frustrated….” |
| High WRS score clinics | “We have a really great chain of command that empowers us to make decisions and then also when we have problems to voice those concerns and tell them what our hurdles are and so they can help us on their end or help us with ideas about how to overcome the hurdles that we’re encountering.” |
APPENDIX M

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE DESCRIPTIVES
### IPAQ Descriptives

Medians (IQR) and correlations ($N = 488$)

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*Note.* IQR – interquartile range.
APPENDIX N

PARTICIPANT CHARACTERISTICS
## Participant Characteristics

Descriptive participant characteristics ($N = 488$)

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*Note. FRL = Free/reduced lunch percentage.*
APPENDIX O

PHYSICAL ACTIVITY SCORES (MINUTES/DAY) BY PARTICIPANT CHARACTERISTICS AND TEACHING ASPECT
### PA Scores (Minutes/Day) by Participant Characteristics and Teaching Aspects

Median (IQR) PA scores according to participant characteristics and teaching aspects

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<td>10.00 (20.00)</td>
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*Note.* IQR = Interquartile range.
APPENDIX P

PHYSICAL ACTIVITY SCORES (MET/MIN/WK) BY PARTICIPANT CHARACTERISTICS AND TEACHING ASPECTS
### PA Scores (MET/Min/Wk) by Participant Characteristics and Teaching Aspects

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<td>330.00 (1237.50)</td>
<td>44.00 (490.00)</td>
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<td>Current position</td>
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<tr>
<td>General education teacher</td>
<td>918.00 (4700.00)</td>
<td>528.00 (1930.50)</td>
<td>.00 (120.00)</td>
<td>.00 (0)</td>
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<tr>
<td>Specials teacher</td>
<td>782.00 (1231.00)</td>
<td>396.00 (858.00)</td>
<td>80.00 (300.00)</td>
<td>.00 (240.00)</td>
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<tr>
<td>Support staff</td>
<td>302.25 (880.75)</td>
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<td>.00 (0)</td>
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<td>Administration</td>
<td>900.00 (2367.00)</td>
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<td>20.00 (150.00)</td>
<td>.00 (240.00)</td>
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<td>495.00 (1448.00)</td>
<td>198.00 (915.75)</td>
<td>80.00 (210.00)</td>
<td>.00 (90.00)</td>
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<td>District FRL%</td>
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<td>25.1 – 50% (mid-low)</td>
<td>769.50 (1330.00)</td>
<td>255.75 (783.75)</td>
<td>60.00 (230.00)</td>
<td>.00 (80.00)</td>
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<tr>
<td>50.1 – 75% (mid-high)</td>
<td>730.00 (1828.63)</td>
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<td>680.00 (1818.00)</td>
<td>396.00 (1452.00)</td>
<td>.00 (180.00)</td>
<td>.00 (0)</td>
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<td>Variable</td>
<td>Total Work PA (MET/min/wk)</td>
<td>Walking PA (MET/min/wk)</td>
<td>Moderate PA (MET/min/wk)</td>
<td>Vigorous PA (MET/min/wk)</td>
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<td>-----------------------------------------</td>
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<td>------------------------</td>
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<td>40.00 (180.00)</td>
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<td>.00 (80.00)</td>
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<td>.00 (240)</td>
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<td>.00 (0)</td>
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<td>.00 (60)</td>
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<td>No</td>
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*Note.* IQR = Interquartile range.
APPENDIX Q

MANN-WHITNEY U RESULTS FOR GENDER
### Mann-Whitney U Results for Gender

<table>
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<th>PA variable</th>
<th>Groups</th>
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<th>$U$</th>
<th>$p$</th>
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<tr>
<td>Vigorous PA min/day</td>
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<td></td>
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</tr>
<tr>
<td>Male</td>
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<td>.00</td>
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<td>.06</td>
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<td>.00</td>
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<td></td>
<td></td>
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<td>Moderate PA min/day</td>
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<td>Walking PA min/day</td>
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<td></td>
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<tr>
<td>Male</td>
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<td>14847.50</td>
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<td>Total work PA min/day</td>
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<td></td>
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<td>Male</td>
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<td>14700.50</td>
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<tr>
<td>Female</td>
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*Note.* Male ($n = 85$); Female ($n = 403$).
APPENDIX R

KRUSKAL-WALLIS H RESULTS FOR CURRENT POSITION
## Kruskal-Wallis H Results for Current Position

<table>
<thead>
<tr>
<th>PA variable</th>
<th>Groups</th>
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<th>Median</th>
<th>Chi-Square</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vigorous PA min/day</td>
<td>General education teacher</td>
<td>239.67</td>
<td>.00</td>
<td>9.875</td>
<td>.04</td>
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<td>.00</td>
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<td>Support staff</td>
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<td>Administration</td>
<td>275.91</td>
<td>.00</td>
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<tr>
<td></td>
<td>Other</td>
<td>253.48</td>
<td>.00</td>
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<td>General education teacher a</td>
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<td>.00</td>
<td>15.517</td>
<td>.00</td>
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<td>278.86</td>
<td>15.00</td>
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<td>Support staff b</td>
<td>216.24</td>
<td>.00</td>
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<td>Administration</td>
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<td>Other</td>
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<td>General education teacher a</td>
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<td>40.00</td>
<td>22.817</td>
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<td>189.85</td>
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<td>Other</td>
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<td>21.640</td>
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<td>55.00</td>
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<td>Support staff a b</td>
<td>179.47</td>
<td>30.00</td>
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<td>Administration</td>
<td>284.91</td>
<td>62.50</td>
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<td>Other</td>
<td>233.21</td>
<td>40.00</td>
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</table>

*Note.* General education teacher (n = 227); Specials teacher (n = 105); Support staff (n = 72); Administration (n = 22); Other (n = 62). *Kruskal-Wallis test; different letters (a or b) denote significant differences (p < .05) determined by Dunn’s test.
APPENDIX S

MULTIPLE REGRESSION RESULTS FOR AGE AND YEARS OF FULL-TIME EXPERIENCE
### Multiple Regression Results for Age and Years of Full-time Experience

#### Correlations of total work PA min/day and age and years full-time ($N = 488$)

<table>
<thead>
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<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>1. Total work min/day</td>
<td>-</td>
<td>-.17</td>
<td>-.06</td>
</tr>
<tr>
<td>2. Age</td>
<td>-</td>
<td>-</td>
<td>.44</td>
</tr>
<tr>
<td>3. Yrs. full time</td>
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<td>-</td>
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</table>

#### Walking PA min/day:

Correlations of walking PA min/day with age and years full-time ($N = 488$)

<table>
<thead>
<tr>
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<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Walking PA min/day</td>
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<td>-.17</td>
<td>-.07</td>
</tr>
<tr>
<td>2. Age</td>
<td>-</td>
<td>-</td>
<td>.44</td>
</tr>
<tr>
<td>3. Yrs. full time</td>
<td></td>
<td>-</td>
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</table>

#### Standard regression results for walking PA min/day

<table>
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<tr>
<th>Model</th>
<th>b</th>
<th>SE-b</th>
<th>Beta</th>
<th>Pearson $r$</th>
<th>$sr^2$</th>
<th>Structure Coefficient</th>
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<tbody>
<tr>
<td>Constant</td>
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<td>11.042</td>
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<td>Age</td>
<td>-1.024</td>
<td>.284</td>
<td>-.180</td>
<td>-.178</td>
<td>.026</td>
<td>-1.0</td>
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<tr>
<td>Years full-time</td>
<td>.029</td>
<td>.456</td>
<td>.003</td>
<td>-.076</td>
<td>.000</td>
<td>.41</td>
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#### Total work PA min/day:

Standard regression results for total work PA min/day

<table>
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<th>Model</th>
<th>b</th>
<th>SE-b</th>
<th>Beta</th>
<th>Pearson $r$</th>
<th>$sr^2$</th>
<th>Structure Coefficient</th>
</tr>
</thead>
<tbody>
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<td>Constant</td>
<td>120.632</td>
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<td>Years full-time</td>
<td>.225</td>
<td>.507</td>
<td>.022</td>
<td>-.061</td>
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APPENDIX T

MANN-WHITNEY U RESULTS FOR LEVEL OF INSTRUCTION
### Mann-Whitney U Results for Level of Instruction

<table>
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<tr>
<th>PA variable</th>
<th>Groups</th>
<th>Mean Rank</th>
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<th>U</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vigorous PA min/day</td>
<td>Elementary</td>
<td>238.45</td>
<td>.00</td>
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<td>Secondary</td>
<td>251.40</td>
<td>.00</td>
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<td>Moderate PA min/day</td>
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<td>246.68</td>
<td>10.00</td>
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<td>27.50</td>
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*Note.* Elementary (n = 260); Secondary (n = 228).
APPENDIX U

KRUSKAL-WALLIS H RESULTS FOR HIGHEST DEGREE EARNED
### Kruskal-Wallis H Results for Highest Degree Earned

<table>
<thead>
<tr>
<th>PA variable</th>
<th>Groups</th>
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<th>Median</th>
<th>Chi-Square</th>
<th>p</th>
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<td>Vigorous PA</td>
<td>Less than bachelor’s</td>
<td>267.00</td>
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<td>Master’s</td>
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<td>Less than bachelor’s</td>
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<td>Master’s</td>
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</table>

*Note.* Less than bachelor’s (n = 34); Bachelors (n = 147); Master’s (n = 287); Education specialist or doctor’s (n = 20).
APPENDIX V

MANN-WHITNEY U RESULTS FOR
DISTRICT LOCALE
### Mann-Whitney U Results for District Locale

<table>
<thead>
<tr>
<th>PA variable</th>
<th>Groups</th>
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<th>U</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Suburban</td>
<td>240.62</td>
<td>50.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Rural \((n = 109)\); Suburban \((n = 379)\).
APPENDIX W

MANN-WHITNEY U RESULTS FOR PRESENCE OF AN EMPLOYEE WELLNESS PROGRAM
Mann-Whitney U Results for Presence of an Employee Wellness Program

<table>
<thead>
<tr>
<th>PA variable</th>
<th>Groups</th>
<th>Mean Rank</th>
<th>Median</th>
<th>U</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vigorous PA min/day</td>
<td>No</td>
<td>231.87</td>
<td>.00</td>
<td>20452.00</td>
<td>.13</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>248.57</td>
<td>.00</td>
<td></td>
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</tr>
<tr>
<td>Moderate PA min/day</td>
<td>No</td>
<td>222.71</td>
<td>.00</td>
<td>19362.00</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>251.53</td>
<td>10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walking PA min/day</td>
<td>No</td>
<td>233.92</td>
<td>30.00</td>
<td>20697.50</td>
<td>.34</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>247.91</td>
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</tr>
<tr>
<td>Total work PA min/day</td>
<td>No</td>
<td>228.68</td>
<td>45.00</td>
<td>27212.50</td>
<td>.15</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>249.60</td>
<td>50.00</td>
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</tbody>
</table>

*Note.* No (n = 119); Yes (n = 369).
APPENDIX X

MANN-WHITNEY U RESULTS FOR DISTRICT FREE/REDUCED LUNCH PERCENTAGE
<table>
<thead>
<tr>
<th>PA variable</th>
<th>Groups</th>
<th>Mean Rank</th>
<th>Median</th>
<th>U</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vigorous PA min/day</td>
<td>Mid-high</td>
<td>242.59</td>
<td>.00</td>
<td>101889.00</td>
<td>.32</td>
</tr>
<tr>
<td></td>
<td>Mid-low</td>
<td>256.28</td>
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</tr>
<tr>
<td>Moderate PA min/day</td>
<td>Mid-high</td>
<td>240.88</td>
<td>.00</td>
<td>12761.00</td>
<td>.13</td>
</tr>
<tr>
<td></td>
<td>Mid-low</td>
<td>266.84</td>
<td>10.00</td>
<td></td>
<td></td>
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<tr>
<td>Walking PA min/day</td>
<td>Mid-high</td>
<td>245.98</td>
<td>30.00</td>
<td>13657.00</td>
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<td></td>
<td>Mid-low</td>
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<tr>
<td>Total work PA min/day</td>
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<td>.90</td>
</tr>
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<td>Mid-low</td>
<td>246.38</td>
<td>50.00</td>
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</tbody>
</table>

*Note.* Mid-high (*n = 420*); Mid-low (*n = 68*).
APPENDIX Y

DESCRIPTIONS OF EMPLOYEE WELLNESS PROGRAMS
## Descriptions of Employee Wellness Programs

<table>
<thead>
<tr>
<th>Type of wellness/program</th>
<th>$N$</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical wellness</td>
<td>143</td>
<td>Step/weight loss challenges, availability of exercise room, health screenings, flu shots, weekly workouts before school, food programs, monthly exercise calendars</td>
</tr>
<tr>
<td>Combination</td>
<td>100</td>
<td>Weight loss challenges + gratitude program + work-life balance seminar + wellness fair</td>
</tr>
<tr>
<td>Provided resources</td>
<td>62</td>
<td>Provided incentives, information on living healthy lifestyles, monthly newsletters in bathroom stalls, emails providing health education on different topics, wellness tips, provision of water bottles to all employees</td>
</tr>
<tr>
<td>Did not know</td>
<td>51</td>
<td>Did not know any information about the employee wellness program</td>
</tr>
<tr>
<td>Emotional wellness $^a$</td>
<td>0</td>
<td>On-site mental health counseling, stress management workshop</td>
</tr>
<tr>
<td>Career wellness $^a$</td>
<td>0</td>
<td>Work-life balance professional development</td>
</tr>
<tr>
<td>Spiritual wellness $^a$</td>
<td>0</td>
<td>Meditation room, mindfulness program, gratitude program</td>
</tr>
<tr>
<td>Intellectual wellness</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Environmental wellness</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Social wellness</td>
<td>0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note. Combination = participants described their program as targeting multiple types of wellness; Provided resources = participants described their program as providing resources (e.g., newsletters, emails) on health-related topics without indicating a type of wellness; Did not know = participants expressed that they had an employee wellness program but did not know any details about it.

$^a$ Indicates a type of wellness that was described by participants as part of their program but was implemented with initiatives that targeted other types of wellness, so it was included in the “combination” type of wellness/program.
APPENDIX Z

CASE ANALYSIS RESULTS
Case Analysis Results

Ben (Low PA) – Instructional Coach

**Theme 1: Valued and wanted to improve his health.** Ben was aware of his own health issues but wanted to improve them because he valued his health and future quality of life. Related to his current health and PA habits, Ben said that:

I am aware of the fact that by nature I am a generally sedentary person. The things that I enjoy doing are largely not physical I’m an artist. I’m a writer. I play piano. So I’m pretty active in terms of doing things, but most of what I do doesn’t involve certainly, you know, like a high heart rate kind of exercise.

He expressed that he recognized “the value and importance of health” and that he has religious beliefs that encourage him to value his health. He also acknowledged that his current health habits will influence his future quality of life when he said:

But I’m also 43 and so I recognize that my health in terms of how I eat and how I exercise is going to have a significant impact on my future quality of life. And that becomes increasingly truer the older I get.

Ben noted that he feels better when he exercises and wanted to be “intentional” about improving his health. Furthermore, he expressed that participating in the interview may help him to figure out ways to improve his health.

**Theme 2: Need for someone else to plan and implement the employee PA program.** Ben expressed that he liked the idea of having an employee PA program in his school, but that there would need to be someone at the school besides himself to plan and implement the PA program. For example he said: “I would love to have this going on in my school and somebody else was running it and then I could participate in it.” He did
not think he would be a good person to implement the program due to having other job responsibilities and a lack of time for planning and implementing the program:

If I were to take on something like this and try to create it within the context of my school, it’s going to take time … and I have many, many things that are a part of the time that I need to spend doing things. And I'm not sure that I would be in that space right now in my life.

He thought that the leader of the school wellness committee could potentially take the lead on planning and implementing an employee PA program. Although he did not perceive himself as a good fit for the job currently, he noted that he may get to a point in the future where he would be willing to plan and implement the program himself.

**Theme 3: Lack of coworker support.** Ben perceived that health was not a focus of his coworkers while at school. Ben expressed that his coworkers’ focus was on work rather than health when he said:

It’s not like people are anti health or something, but the focus of work while we’re at work is doing the work. The idea of being healthy at work or exercising while you’re at work is not something that’s necessarily talked about a whole lot.

In order to get more coworkers concerned with health, Ben thought that creating a “culture of health” was necessary. To do this, he suggested making an employee PA program “social” and having administration support and promote the program. He also thought that establishing and sustaining an employee PA program over several years would contribute to a culture of health, especially for new employees:

And motivationally, something that’s been established and people are engaged with and doing has a tendency to be much more attractive, such that if you could…get it sustained and moving enough, then when you have new people coming into the building two or three years down the road, this is a piece of the culture that already exists in the building. …. And so that would be a natural way to pull people into that more. The trick is trying to change the culture in the first place.
Theme 4: Lack of time. Ben perceived that a major barrier to implementing an employee PA program was a lack of time during the school day. He expressed that the lack of time was due to having other responsibilities during the school day. For example Ben said: “Barrier wise, the biggest one would be time…because of the number of other responsibilities people have…to life and work and things that happen.” He also expressed that having a new job as an instructional coach instead of being a teacher has taken away personal time that he used to have during the school day that could have been used to be physically active:

So last year I was an English teacher and had been for 13 years. The schedule actually made it a bit easier because there were certain periods of time where…designated as personal time…It was rare for people to come and seek my attention during those windows of time. So I had the ability to, if I so chose and was motivated, then I could use my time that way. In the job I now hold, there is no designated downtime for me and there’s a lot more people who are seeking me out for all sorts of things. So having personal downtime to do pretty much anything, it’s something I have to be pretty intentional about setting aside during the school day.

Daisy (Low PA) - Teacher

Theme 1: Valued PA. Daisy valued PA for herself, her students, and other employees. She was the head of the school wellness committee and had recently implemented a walking competition for employees because she wanted to get teachers more active:

So the walking competition was designed by the wellness committee, which I'm head of. And we wanted to get teachers more active and just aware…of a healthier lifestyle and that it's not some big strenuous path, that it can just be as simple as walking.

She participated in the competition and would walk in the mornings and during school with other teachers:
During personal plan time I was part of the walking competition, so I was never trying to be sitting ever. I would take laps in the morning with other teachers. We'd walk to each other's classroom, always trying to be walking during the school day.

Daisy also implemented and participated in PA in her classroom for her students in the form of choreographing and performing dances during play practice and taking students for walking breaks. Daisy personally valued PA and keeping herself physically healthy: “So I just have a belief and values that we all should live a healthier lifestyle. We're only giving, given one body, we should treat it like we're a Lamborghini and not a junker.” She also believed that teachers should teach students about the importance of health.

**Theme 2: Personal qualities or abilities that allowed her to implement PA in her school.** Daisy noted a number of personal qualities or abilities that allowed her to be successful at implementing PA in her school as head of the wellness committee. First, she believed that her planning abilities allowed: (1) the wellness committee to make time for meetings, (2) the wellness committee to ensure funding was sufficient, and (3) her to remember which tasks to implement when for the walking competition. For example Daisy said: “We only have so much through funds to do things every year, so we have to really plan out what we all want to do in the year just to make sure that everything can be covered with the funds that we do have.” She also believed that not being afraid to ask questions allowed her to obtain prizes that the wellness committee would not have been able to afford otherwise:

I guess just not be afraid to ask questions and get help if we don't know something or asking for help when we need resources. A big human flaw is not being able to ask for help when needed and just trying to overcome that.
Last, Daisy believed that remaining positive would get more employees involved in the PA program:

If we're excited about it, more people are going to get excited about it just because we're excited, and they're like ‘why are you so excited? Let's see what this is all about.’ And then just keeping that going, keeping it interesting and exciting the whole time through. Not just petering out halfway.

**Theme 3: Identified benefits and downfalls of walking and tech-based program.** Daisy identified many benefits of the technology-based program, including that it could: (1) get the community involved, (2) provide reminders to be active, and (3) reach more people. Alternatively, she mentioned that a tech-based program could be frustrating by sending too many notifications and may not work if the internet goes down. She thought that since her school district is a “Google district”, a cell phone application may be easy to implement. She thought that a cell phone application would be beneficial for employees who would not want to hand out their phone numbers, or who do not check their emails frequently.

**Theme 4: Presence of coworker support for PA at school.** Overall, Daisy thought she had a lot of colleague support for PA at her school. First, she perceived her administration to be supportive of the walking competition that she implemented since some of them were involved in it. She mentioned that some administration were advocates of mental and physical health. She also perceived her coworkers to be supportive since more coworkers participated in the walking competition than expected. She also perceived them to be willing to participate and/or plan the program: “There are some that are going to support it just by simply doing that [participating]. There's others that are going to want to plan it with us. There's others who are going to want to send out the messages.” Alternatively, she also mentioned that there were some employees that did
not participate in the walking competition and did not support it: “Some people are like ‘It’s just a competition, it's not that big of a deal, calm down, let's just go home.’ But those of us who were into it ‘we're like, yeah, this is awesome.’” Daisy also mentioned that not only was there a school wellness committee, but there was also a district wellness committee that had been supportive of health initiatives in her school and frequently provided information or resources to her school wellness committee. For example, the district wellness committee provided healthier vending machine options to her school: “I know we have a healthier vending machine option in the teacher's lounge that they approved. That was not through us. That was through the Gal who's in charge of the food at the district level. She's also on the district wellness committee.”

Ian (Low PA) – Teacher

**Theme 1: Identified ways that an employee PA program could be implemented in school.** When discussing the walking and technology-based programs, Ian thought of a few strategies to make them work in his school setting. Although he perceived a during school PA program to be challenging to implement, he noted that a before or after school program could be implemented, or a walking program over lunch could work since some staff already “walk on the track or walk outside on their lunch break together.” He also mentioned that implementing a walking program in which employees only had to keep track of their steps and communicate through email or text would save time:

> If you're just counting your steps throughout the day, I don't see it affecting the time that much, as long as you don't have to allocate space and time after school. And if these were sent out through emails or text messages throughout the day, then that doesn't really take up much of your time because you're usually checking email or your phone anyway.
Also while discussing ways to implement a walking or technology-based program, Ian came up with the idea that doing school-wide brain breaks or recess activities may be the most feasible PA for employees and students to do together:

Here's a brain break you can try with their kids. I could see sending that email or that text out…just to give staff members new things to try and new exercises to try… it'd be new information and it would be something fun that the kids could try and the staff members could try.

Ian also noted that making PA a policy would help with employee participation:

“It's like ‘We want our kids more active so we're going to implement this policy. We want everybody on board.’”

He also thought that making PA with students would increase employee participation, even if they were reluctant: “If it was mandatory or teachers are required to exercise with their students…then you might be reluctant, but usually you're probably going to do it more than, you know, here's your option.”

**Theme 2: Valued PA.** Ian noted that he was physically active after school by participating in after-school yoga classes and Crossfit with other employees in the weight room:

I have sat in on some high school yoga classes that we do, but it's after hours. We do Crossfit twice a week with a football coach. And that's a small group of us, but again, it's not really associated with the school day. It's after hours.

He also mentioned that he valued the social support from others that participated in Crossfit with him. He was also physically active with his students by joining them during recess (e.g., playing catch with students), during an after school run club, and during PE: “I even play hockey with them once in a while.”

Ian believed that his PA behaviors at school were based on his internal motivation to do it: “It's just kind of motivation if you want to be healthy then you'll try to find ways
to work out” He mentioned that he wanted to be a “good role model” for students and to help them develop healthy habits while they were young. He also expressed that a motivation for being active was so that he could continue playing and interacting with students: “I just don't want to be a teacher that can't get bend down and play with the kids or work with them, interact with them. I still want to be able to go into a PE and be able to play tag with them.”

**Theme 3: Importance of communication for implementing employee PA program.** Ian mentioned a number of times that “word of mouth” was important for getting other employees to participate in PA or getting volunteers to help with the student run club. When discussing how he got other employees to participate in the after school Crossfit, he mentioned: “So just kind of talking, word of mouth and just putting that bug in people's ears to show up and come do this with us. Misery loves company.” He also mentioned that sending emails were important to getting employees to participate in health initiatives organized by the school wellness committee.

**Theme 4: Lack of time.** Throughout the interview, Ian mentioned that not having enough time during the day was a barrier to employee PA participation due to having a full schedule: “Part of it’s just time. Just trying to find time in the day. We’re already booked constantly, so every minute’s pretty much built in.” He noted that there was not a good time for employee PA during school, and employees would not want to stay after school because they (1) have other responsibilities (e.g., family life), and (2) would not want to sweat in their work clothes. He also mentioned that no one would prioritize walking over doing their work during their plan time: “I don't think it would really work if it interfered with teacher plan time… I think teachers are probably going to put that
over walking.” Ian also thought that someone else in the school should plan and lead the implementation of the employee PA program because he perceived himself as not having enough time: “I personally, I don't think I would want to. Again, just being as busy as I am.”

**Theme 5: Lack of space.** Although Ian’s school had two gyms and a multipurpose room, employees could rarely use them because they were always being used by students for PE or after school sports:

> We just didn't have the space for it, because there was always practice going on or games, and nobody wants to leave work and then come back. So we could do it later in the evening but getting people to come back to work after they've left for the day I don't think is going to happen and getting people to show up early, they're not going to want to be hot and sweaty right before works. So, again it’s just kind of space.

Ian also mentioned that the school population keeps “getting bigger and bigger” so they were continuing to run out of space.

**Melissa (Low PA) – Teacher**

**Theme 1: Valued PA for social aspect.** Melissa valued PA with others in her school. She performed Go Noodle brain breaks with her students “about once every hour, hour and a half” in which they performed a variety of activities such as yoga or dancing. She also played with students at recess. Melissa frequently went on “walk and talks” with other teachers at lunchtime, would walk hallways before meetings in the evenings, participated in Fitbit competitions with other teachers each week, and used to participate in an after school exercise program with other teachers that no longer occurred during the current school year. Melissa also always participated in the school’s wellness committee initiatives, such as the walking/fitness challenge and holiday weight challenges.

Regarding the Fitbit competitions, Melissa said:
Quite a few of us have Fitbit's and we're in Fitbit competitions every week. So we compete against each other. There's not really an incentive other than bragging rights for the week but there's probably five of us that are in competition with each other through Fitbit.

Melissa expressed that she was motivated by having social support and accountability. For example Melissa said:

I think sometimes that social aspect of having someone else that's supporting you, doing it as you're doing it too, I think that is a motivator for a lot of people. It keeps me accountable if I know that I'd have someone waiting for me to go do whatever that we said we were going to do together.

She expressed her belief that accountability was important for teachers to participate in PA: “And I think that accountability piece is, is big for a lot of teachers that we just need someone to say ‘hey you didn't do this.’”

Theme 2: Lack of co-worker PA while at school. Although she expressed that many coworkers were physically active and participated in challenges or lunchtime walks with her, Melissa noted that it was difficult for herself and her coworkers to be active together while at school. She expressed that although her co-workers were active, they would typically go somewhere else other than school to be active:

A lot of my colleagues, they go elsewhere to go work out. So it's not here at school. We have four or five different people that go to I love Kickboxing. I have quite a few that are in gyms or in rec centers. So it's not that we're not active, we're just not …active here at school.

She expressed that many of her coworkers were “committed to being healthy” but did it on their own time “outside of school” or did not know how. Melissa wanted more PA to happen at her school with co-workers because she didn’t like to be active by herself. For example, Melissa said: “It [walking at lunch] happened very rarely because I would be like, ‘I don’t want to go do this by myself.’”
**Theme 3: Lack of time.** A barrier to employee PA during the school day was a lack of time at Melissa’s school. Employees were not allowed to be active while they were on contract hours and had full schedules that forced them to prioritize academics over PA. Melissa noted that there was not enough time to leave school to go for a walk at lunchtime, mornings were busy with planning for the school day, and that employees had after school committee meetings two of days per week:

I think time is the biggest one. People are just so busy… Wednesday nights are a big committee night, so Wednesday nights are almost impossible to get anything done. And then every other Tuesday one person from each grade level meets as a building together.

Melissa also expressed that the after-school committee meetings inhibited the after-school exercise program that she used to participate in with other coworkers from happening:

Between all of my extra committee meetings and all of that… I can't get my coworkers to commit to it. So, that has gone by the wayside this year. But up until this year, we would do anywhere from 30 to 60 minutes after school at least twice a week.

**Theme 4: Creative problem-solving helped her to be active at school.** Melissa expressed that being a create problem solver had enabled her to find ways for herself, other employees, and students to be physically active during the school day. When she and other employees found out that they were not allowed to walk on their plan time, Melissa said, “We had to problem solve that through. And because I'm stubborn and because I work with a bunch of problem solvers, we were able to figure that out.” Melissa expressed that creative problem solving allowed her and other employees to find a time to walk during lunch time:

We knew that we couldn't walk on our plan time and we couldn't walk right after school when the day was over. So instead we took our own personal time during
lunch and we walked during lunch instead. So we have come up with some creative ways of being able to do at least some walking here at school. We all have our tennis shoes here and we just change into our shoes the last five minutes of reading class and take the kids outside for their lunch and recess and then we walk and then we go eat.

Another example of Melissa’s creative problem-solving was when her principal banned recess and she was able to get recess back by showing him research that it was good for the students. Melissa said:

He (principal) doesn’t like it to call be called recess, but we gave him the research that kids need vitamin D to help their brains think. So we call it vitamin D breaks. I told you we had to be very creative on how we got things done.

Likewise, Melissa thought that showing the administration research on the benefits of employee PA may get him to support employee PA during the school day.

Denise (Mod-high PA) – Teacher

**Theme 1: Had social support for being active while at school.** Denise believed that her coworkers would be very supportive of and participate in a walking or technology-based PA program: “I think that our staff would be very supportive of either…Even with our little step challenge, I would say probably 90% of our staff is participating.” Denise would swim and workout with other colleagues at least once a week in the mornings before school. She expressed that having coworkers that value PA helps her to be active as well:

And it always helps if I have colleagues or people around me that value the same thing, that there's somebody to do it with or just to support me to encourage me to get it done. And I do have that. I have very close, my close coworkers very much support that.

She also thought that her administration would “potentially” be supportive of a walking or technology-based PA program. Her school also had a wellness team that promoted health and had recently implemented a step challenge for employees.
Theme 2: Valued PA. Denise expressed that PA helped her to be more productive and was very important to her. She expressed that PA helped her to function better, put her “in a better mood”, and perceived herself to feel less exhausted if she was physically active. For example, Denise said: “I do often feel exhausted because I don't get enough physical activity during the day. And I wish there was some way to schedule it in.” Denise also expressed that her PA is “a good example for my students”, and that she actively promoted PA to her students by discussing it with them.

Theme 3: Lack of time. Denise perceived employee PA to be inhibited by a lack of time during the school day. She expressed that having a full schedule and that the schedule at a secondary school inhibited employee from being active with students:

Elementary versus high schools and middle schools are a little bit different because the scheduling is different…In an elementary school you can take all the fourth graders outside and go for a walk. In a 55-minute class period, I can't give up 20 minutes…of instructional time to just go take a walk.

She also expressed that using plan time to be physically active would be impossible, due to work obligations: “And then on our plan time we are just inundated with paperwork…that keeps us from doing anything physically active during a plan time.”

Theme 4: Identified ways to implement employee PA program - “find a way to do it.” Denise identified numerous strategies that would allow either a walking or tech-based program to be implemented in her school. First, she believed that barriers in her school setting could be overcome when she said, “we could figure out how to make it work.” Although she had previously stated that using plan times to be active would be impossible, Denise came up with a strategy for implementing a walking program during plan time: “We have a team plan time, so if we had even one to two 30-minute periods a
week that we were allowed to use our team plan time to go be physically active, something like that could work.” She also thought that the school building and town could be used for a walking program, even though there weren’t designated places to walk. She also considered strategies for overcoming inclement weather:

We could walk around a couple blocks. It’s a very small town, very low traffic. So you can just walk around town. We can come up with some kind of a track. Plus our campus is spread over a couple of different blocks so you can even walk from one building to another building on campus. And we have a two story school. So in inclement weather, if you had to do it inside, you could…go up the stairs, down the hallway, down the stairs, make a loop.

Kacey (Mod-high PA) – Teacher

Theme 1: Valued PA. Kacey was a teacher that valued PA for herself, her students, and other teachers. Kacey believed that PA was good for her physical and mental health and helped her to remain “positive” and “grateful”. She also perceived that PA allowed her to “give more to others” and helped her to be a better teacher. For example, Kacey stated: “I want to make sure I keep on top of it [PA] just as more of a mental health tie in. Because I know the more I talk and walk with somebody…that just makes me feel better.”

Kacey also believed that it was important for her to instill healthy habits to her students at a young age and that modelling PA for students was important. She expressed believing that PA helped her students perform better:

They’ve [students] been sitting for a while, and sometimes they'll say, ‘Oh we have to do a fit stick?’ I’m like, ‘Yes, you have to do a fit stick. You've been sitting now for about 20 minutes and you need to move around. You know, why? Well, because it's good for your brain and it's going to help your brain work better.’ And it's just something I treasure but I don't know how to make them feel the same way.
Likewise, Kacey noted that she was physically active with her students on a daily basis. She joined students in PE, performed Fitstick and Go Noodle activities, and participated in run club with students. Kacey noted the types of activities she performed with students in PE:

I usually join them at the beginning. So they're warming up, like they're jogging or they're running in place or they're stretching. It’s whatever activity they’re doing, I just join in with. If they're practicing skipping or they're practicing jumping or hopping… I just join in.

Additionally, Kacey was physically active with other teachers by going on “walk and talks” during lunchtime and recess and participated in the after-school yoga classes for employees. Kacey described the “walk and talks” with other teachers:

We eat a little bit of lunch and then there's a couple cul-de-sacs around here and we just kind of go up and down the cul-de-sacs a little bit and not really around the block because that's too far…because you got to get back because there's things to get done.

She also continued to think about ways to get other teachers more active at school. She believed that having employees see other employees be successful with health initiatives and that sharing how PA has positively impacted her life may prompt more participation. She also expressed that having a “social” aspect to PA at school would help teachers to not feel isolated:

You have to take time to talk and be with other people too. And I think sometimes this is pretty isolating. People get to their classroom or they stay in their classroom and they don't branch out… We don't leave them. When the kids are with us you're kind of stuck. But then even when the kids aren't here… I think people kind of just stay in their own little world. And so we're trying to break down some of those barriers and say, ‘Hey, let's go eat lunch outside’ and then, ‘Oh, hey, why don't we take a short walk?’

Kacey also briefly mentioned that getting parents involved in school-wide PA programs would be important for students’ PA.
**Theme 2: Presence of employees who valued health and PA.** Kacey had both a district and school wellness committee that encouraged healthy habits for both students and teachers. The district wellness committee provided health fairs, step challenges, mindfulness activities, and incentives for participation. Kacey expressed that the school wellness committee was very encouraging of employee PA during the school day and making healthy choices. For example, when asked about environmental supports, Kacey stated:

> We do have a school wellness team and they're always encouraging us to just make good choices food-wise...activity wise too. So I would say encouragement from them to walk during the lunchtime or... when you're out at recess with the kids do things with them, not just stand or sit around.

Kacey also perceived her fellow coworkers to be encouraging about health for employees as well as students and were typically receptive to wellness committee initiatives. She also perceived fellow coworkers to be physically active, but more so outside of school on the weekends. For example, Kacey stated:

> I would say a lot of our staff is very active and...they'll invite others to join them, but a lot of those activities are outside of school, not within the school day. Because there's one guy, he loves to bike on the Poudre trail, so he'll say, 'Hey, I'm meeting at the Poudre trail, eight o'clock Saturday, come join.' Or I think there's a lot of people who do things and encourage others to do things, but it's more outside of school.

**Theme 3: Lack of time.** A lack of time due to having a full schedule both in and outside of school was perceived as a barrier to PA during school. Kacey mentioned that having family responsibilities after school, short lunch times, and a full schedule inhibited employee PA. She mentioned that many employees prioritized work over PA to avoid bringing work home and to meet the demands of work. For example, Kacey stated:
I hate to say the biggest barrier is just time. Because even if we had a beautiful walking path I'm not sure if people would take the time to use it. I think they feel too stressed and too under pressure for everything else to take time to do it.

She also stated that making sure students score well on their assessments forces employees to prioritize work: “There's such pressure to get all this stuff done. To make sure they [students] can score well on these tests and make sure they can do well on these assessments.”

Matthew (Mod-high PA) – Campus Monitor

**Theme 1: Nature of job supported unintentional PA, but prevented purposeful PA.** Matthew was a campus monitor who was responsible for the security of the building, staff, and students, and who filled in as needed for classroom teachers or custodians. Being a campus monitor allowed him to be physically active “most of the day” by walking the halls, helping custodians, delivering mail, and lifting boxes.

Additionally, Matthew expressed that most of his activity was “work-related” and that he was active by: “Checking doors, walking around, checking the parking lot, going to classrooms, all that type of stuff.” Matthew perceived the job itself as an environmental support to his PA at school, although he did not perceive himself to be “intentionally” physically active while at school. As Matthew said it, “Like I said, it’s just all part of the job.” Working his family farm after school also provided Matthew with work-related PA after school.

Alternatively, Matthew expressed that his job required him to respond to random events throughout the day, which prevented him from being intentionally physically active. Responding to random events could include helping colleagues with student
discipline issues or dealing with security issues at both the middle and high school. As Matthew stated:

I don't know that there's anything really preventing me other than…I have to be available because I don't normally do just the high school. I do the middle school and everything else. So if a fight breaks out here I got to be able to respond and get that taken care of. Or, for kids misbehaving in class, I have to be able to go bring them out of class and get that taken care of. So it's not like I can say, ‘Okay, I'm going to go lift weights and don't bother me for an hour.’ It doesn't work that way. I have to be able to respond.

Matthew also expressed that not having a set schedule and having to respond to events as they occurred prevented him from being intentionally physically active or participating in PA with coworkers.

**Theme 2: Presence of physically active culture at school that he was not part of.** Matthew described a number of PA initiatives at his school that coworkers participated in, but he did not. Matthew’s coworkers participated in after school yoga classes and a one-time spin class that was organized by the PE department. Some employees used the weight room after school or went on walk and talks during the school day. When asked about implementing either a walking or technology-based program in his school, Matthew thought that other employees would be receptive to an employee PA program, since some of them were into fitness. Matthew perceived that other employees would participate in a walking program and would potentially be interested in a technology program. Matthew perceived an employee PA program as something employees could use to unwind at the end of the day:

A lot of them have to be here an hour or so after school as part of the contracts. So you maybe they'll decide to take a half hour and do that [walking program] and have to use that half hour to grade papers at home, give them some way to unwind.
Although other employees participated in PA during the school day already, Matthew expressed that he had never been involved and did not know much about activities. For example, he said: “They just redid all the weight room and everything, so I don't know if they're going to be doing it there or what. Like I said I never participate. I'm just guessing.” Matthew was not aware of any PA policies that existed at his school, how many employees participated in the PA classes, or where the PA classes were held.

**Theme 3: Lack of time.** Matthew expressed that not having enough time during the school day prevented employee PA. His school had before school meetings that prevented PA as well as after school tutoring. He also expressed that teachers faced academic pressures and were busy with grading and planning so using their planning periods for during school PA would not be feasible. For example, Matthew stated:

> I think that would be a little tougher because the teachers pretty much have those planning periods and they're already dedicated to what they need to get done during those planning periods because of our school. We have a very unique school and they've got some hard challenges that they have to overcome. So they use a lot of those planning periods to come up with strategies for that and now you're going to try and take that away for them to do walking? I don't know.

Interestingly, Matthew talked about a lack of time more for teachers than for himself as a campus monitor. However, he already expressed that his job prevented him from having time to be purposefully physically active due to always having to “be available.”

**Miles (Mod-high PA) – Counselor**

**Theme 1: Perceived employee PA program to be completely unrealistic.**

Although Miles liked the idea of having an employee PA program during the school day, he thought it was completely “unrealistic.” First, Miles expressed that employee PA with students was completely unrealistic due to students’ short attention span:
Let's say you have 20 minutes to do something. You spend…probably five to eight minutes of that time just getting from point A to point B because little guys don't have the attention span. And if you're walking around the school yard over 20 minutes…you're going to need three or four staff to keep everybody together if they're in first grade. It's unrealistic, but the idea and the concept is awesome.

He also thought that other employees would perceive an employee PA program to be unrealistic. Miles perceived that the only way for an employee PA program to work would be for it to be a technology-based program that allowed employees to track their PA outside of school hours with the option to participate with others. For example, Miles expressed the following idea:

Organize the walk and say, ‘On Saturday we're going to go up Lory state park. Those of you that can make it we would love to have you….We're walking a couple of days a week after school for 20 minutes or a half hour…or bike riding together to promote the social part of exercise.’ And meanwhile, stressing that if you can't be there, ‘Make sure to do it on your own and you track it.’

Miles expressed that the only way for him to be physically active at school would be for him to neglect his job as a counselor. He expressed that leaving his work to be physically active would be “unethical” and could result in neglecting a suicidal kid. Miles expressed:

It would border on if not flat out be a dereliction of duty, unethical practices. Because in order to get the exercise you would have to leave the building and…if I were to be gone for an hour, hour and a half at a time….my work isn't getting done and that means that kids are not being seen. And not to be over grandiose about my profession, however, we're seeing that more and more it could potentially let a kid slip through the cracks that potentially could be suicidal.

He also believed that since he worked out at home already, he did not need an employee PA program at school: “I don’t need to be part of a program in order to do that. I’ve got all my equipment at home.”
**Theme 2: Valued PA.** Miles valued PA for himself, his family, and his students. Miles used to be more physically active when he was younger, but still found ways to workout at home and expressed that:

Right after I graduated high school, I was in the marines, and stayed pretty active and then was really involved in trail work and Lory state park as part of my work. So I was really into outdoors and I'm a hunter and stuff. So over the years I've let myself go, but I might still, lift weights and do cardio and I find ways to hurt myself.

Miles also expressed wanting to pass down his values of PA to his family: “Those ideologies are still important to me and I want to pass those on to my children.” He also got his kids to be active with him: “I’ve got a kid nephew that just moved in with me, me and my kids. But they do it now. I’ve got them on the regiment where they’re exercising and what not.”

Miles believed PA is important for the students at his school. Miles stated: “The more we can get them moving and teaching them the importance of PA, I’m all on board.” He actively advocated for students to exert energy in Physical Education class and for teachers to give students PA breaks because he believed students focused better. For example he said: “Sometimes the counseling department works with teachers to get those students more active…to run some energy off, so they’re better able to focus.”

Miles was also physically active with his students during counseling sessions as long as the weather was nice. Miles expressed:

Being active with students I do as often as I can when it’s feasible. ‘Hey it’s really pretty outside, let’s go walk.’ This little person has a tendency to do better when we run some energy off so that person gets ten minutes with me to go play soccer before he goes to class.

**Theme 3: Need for someone else to plan and implement an employee PA program.** Miles expressed that a major barrier to implementing an employee PA
program was that there was no one at his school to plan and implement the program:

“There is nobody to organize it, nobody to oversee it, nobody to offer out incentives.” He expressed that he did not know who would to take on the responsibility, nor would he want to take on the task because of everyday responsibilities:

I don’t have the time, energy or desire to do it, to put it together with all the stuff that I have on my day to day life, trying to continue my own education. I’m raising my children, going to a second job. It is again, something that I liked the idea of, but push come to shove, it’s not that high on the food chain for me personally.

Miles mentioned that having an outside organization come into the school to implement an employee PA program would likely make the program work, but the cost of having to pay an outside organization to implement it would be a barrier.

**Theme 4: Lack of time.** Miles expressed that not having enough time during the school day was a barrier to implementing an employee PA program. Having full schedules before, during and after work as well as counseling sessions that last longer than expected could inhibit the implementation and employee participation in an employee PA program. Miles noted:

Well, just…lack of time in the school day. It’s pretty much from the time you get here to the time you leave you’re doing something student related so there’s no real allotment there to fit in exercise….So even if I have a blank schedule, I have a running list of kids that I can see.

Likewise, Miles did not think that anyone at his school had the time to plan and implement an employee PA program:

So, what I'm imagining is this: there's this group that somebody manages, there's some oversight, a little bit of accountability, and it's all positive the way I would see it. But who's got the time to do it?
APPENDIX AA

JOINT DISPLAY FOR GROUP DIFFERENCES
IN PHYSICAL ACTIVITY SUPPORT SYSTEM
## Joint Display for Group Differences in Physical Activity Support System

<table>
<thead>
<tr>
<th>Group differences in the theme: PA support system</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of support: Presence of employee wellness committee/program</strong></td>
</tr>
<tr>
<td><strong>Low PA</strong></td>
</tr>
<tr>
<td><strong>Mod-High PA</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Type of support: Co-worker support</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low PA</strong></td>
</tr>
<tr>
<td><strong>Mod-high PA</strong></td>
</tr>
</tbody>
</table>
APPENDIX BB

JOINT DISPLAY FOR GROUP DIFFERENCES IN OVERCOMING BARRIERS
Joint Display for Group Differences in Overcoming Barriers

<table>
<thead>
<tr>
<th>Group differences in the theme: Overcoming barriers</th>
<th>PA Group</th>
<th>Presence of employee wellness programs</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low PA</td>
<td></td>
<td>Yes ($n = 4$)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes, but never participated ($n = 0$)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No ($n = 0$)</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>It's a very, very small town, very low traffic. So you can just walk around town. We can come up with some kind of a track. Plus our campus is spread over a couple of different blocks so you can even walk from one building to another building on campus. - Daisy</td>
<td></td>
</tr>
<tr>
<td>Mod-high PA</td>
<td>Yes ($n = 1$)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Yes, but never participated ($n = 2$)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No ($n = 1$)</td>
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<tr>
<td></td>
<td>I'm not doing it [PA] at school…Like I said, people would love the idea of this, but it's just not realistic or feasible. - Miles</td>
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<td></td>
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</tbody>
</table>