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Physical Educators' Habitual Physical Activity and Self-Efficacy for Regular Exercise

Xihe Zhu, Justin A. Haegele, Summer Davis

Abstract

The purpose of this study was to examine physical education teachers' habitual physical activity and self-efficacy for regular exercise. In-service physical education teachers (N = 168) voluntarily completed an online questionnaire that included items to collect demographic information (gender, race/ethnicity, years of teaching experience, and perceived weight status), self-efficacy, and habitual physical activity. The physical educators reported a high level of physical activity with an estimated total weekly MET-minutes > 3,000, and a relatively high self-efficacy for exercise. A multiple regression analysis showed years of teaching experience as a significant negative predictor ($\beta = -.35$, $p < .05$), but self-efficacy as a positive predictor ($\beta = .39$, $p < .05$) for physical educators' daily moderate to vigorous physical activity. These findings illustrate the positive role of self-efficacy for promoting physical activity participation, but indicate diminishing physical activity as a function of years of teaching experience among physical educators.

Xihe Zhu is an associate professor, Department of Human Movement Sciences, Old Dominion University. Justin A. Haegele is an assistant professor, Department of Human Movement Sciences, Old Dominion University. Summer Davis is a graduate student, Department of Human Movement Sciences, Old Dominion University. Please send author correspondence to x2zhu@odu.edu

In the United States, the national physical education (PE) teacher education standards (National Association for Sport and Physical Education [NASPE], 2008) and proposed revisions (Society of Health and Physical Educators [SHAPE America], 2016) emphasize, among other competencies, that physical educators should exemplify the characteristics of a physically literate individual. A physically literate individual possesses the knowledge, skill, and confidence necessary for a physically active lifestyle (SHAPE America, 2014). There is an abundance of literature concerning students' habitual physical activity (PA) and self-efficacy for participating in exercise, but no existing research has explored this relationship for PE teachers. Therefore, the purpose of this study was to determine PE teachers' habitual PA and self-efficacy for regular exercise.

From an occupational health perspective, PE teachers have been the focus of a few previous studies. Sandmark, Wiktorin, Hogstedt, Klenel-Hatschek, and Vingard (1999) examined the physical workload of 30 PE teachers and found the physical load on the lower extremities, back, and cardiovascular system was relatively high. More recently, Trudeau, Laurencelle, and Lajoie (2015) reported that although physical educators' absolute energy expenditure at work was low to moderate, they often had periods of vigorous PA. In summary, it seems the occupational aspects related to the PE teacher profession can generate episodes of moderate and vigorous PA. However, the total accumulated PA amount is not clear.

Although occupational PA contributes to overall PA participation (Bensley & VanEenwyk, 2011), high occupational PA levels are not necessarily associated with desirable health outcomes. For example, Holtermann et al. (2012) reported that high occupational PA might be associated with a higher rate of all-cause mortality, particularly among men with low leisure-time PA. Similarly, Bahls et al. (2015) reported that voluntary PA was associated with a reduced risk for all-cause mortality, but occupational PA was not. This suggests that the benefits of PA may differ depending on the type. As such, total habitual PA, including voluntary and occupational having different effects on health, warrants further investigation.

Self-efficacy has been identified as an important direct and indirect predictor for PA participation in a variety of populations (Dishman et al., 2005; McAuley et al., 2005). Based on social cog-

nitive theory, self-efficacy refers to a person's confidence in his or her capacity to execute behaviors or achieve a specific outcome (Bandura, 1997). According to Bandura (1994), human accomplishments can be enhanced by a strong sense of self-efficacy, and those individuals with strong confidence in their abilities approach difficult tasks as "challenges to be mastered rather than as threats to be avoided" (p. 1). Research regarding teacher efficacy has primarily focused on the association with positive teaching behaviors (e.g., trying new instructional ideas and/or better classroom management) and student achievement (Goddard, Hoy, & Hoy, 2004; Ross, 1998). No past study has reported teachers' self-efficacy in relation to their health-related behaviors such as engagement in habitual PA.

For PE teachers in particular, engagement in regular PA is not only a professional expectation (NASPE, 2008; SHAPE America, 2014), but also necessary for receiving health-related benefits of PA. As adults who interact with students in PA contexts regularly, physical educators are likely role models and/or significant adult figures in motivating children to participate in sports and PA (Warnick, 2009). Therefore, physical educators' self-efficacy and PA merit research from health and professional perspectives. Through examining physical educators' habitual PA and self-efficacy for regular exercise, this study represents an important initial step toward quantifying physical educators' total PA participation and identifying the contribution of self-efficacy, among other factors.

Method

Research Design

The study used a descriptive, correlational research design to report physical educators' self-efficacy, self-reported habitual PA, and the association between them. The institutional review board at the researchers' university reviewed and approved the study protocols.

Participants

Participants were in-service physical educators ($N = 168$) including 72.4% females and 27.6% males. The race/ethnic distribution of the sample was 93.9% Caucasian, 2.7% African American, 2% others, .7% Asian, and .7% Hispanic. Physical educators in this study had an average of 16.27 ($SD = 11.32$) years of teaching experience,

ranging from 1 to 40 years. Although most of the physical educators (75%) considered themselves to be of a normal weight status, 24.4% reported being overweight and 0.6% reported being underweight. Physical educators voluntarily participated in the study through an online survey platform.

Data Collection

Data collection commenced after the study protocols were approved by the university institutional review board. Once the questionnaires were developed and tested functional online, the researchers deployed and distributed the survey by sending it to several professional electronic mailing lists (e.g., PEcentral.com) and posting the recruitment letter and survey link on professional association websites (e.g., Society of Health and Physical Educators). The electronic mailing lists and professional association websites allowed the researchers to access a large pool of in-service physical educators in the United States in an economically efficient manner. Two measures were used to prevent participants from submitting the survey or taking the survey more than once. First, during the data collection process, an algorithm was built in to prohibit multiple submissions once the survey was open. Second, the researchers used statistical functions to identify potential duplicate cases from responses and recorded Internet protocol addresses.

A recruitment cover letter was sent through the electronic mailing lists and posted on the professional association websites. In the letter, the researchers explained the purpose, methods, and estimated time commitment for participating in the study. The inclusion criteria were that the participants had to be 18 years or older and serving as a full-time PE teacher. The cover letter also explicitly stated that participation in the study was voluntary. No incentive was offered in exchange for participation, and no name, e-mail, or school information was collected. Those who read the letter and decided to participate were encouraged to click a link to proceed with data collection, which occurred in spring of 2016.

Measures and Instruments

Demographic information. The online survey began with items collecting physical educators' demographic information such as gender, race/ethnicity, years of teaching experience, and perceived

weight status, whereby the participants identified their perceived weight status as underweight, normal weight, or overweight.

Self-efficacy for regular exercise. The second section of the online survey included the items of the Self-Efficacy for Regular Exercise Questionnaire (Bandura, 2006). For each of the 18 items, participants read a statement about a situation and rated their confidence in performing their exercise routine under a given situation. The confidence ratings ranged from 0 (*cannot do at all*) to 100 (*highly certain can do*). Sample statements describing a variety of situations include "When I am feeling tired," "During bad weather," and "When I am feeling under pressure from work." The aggregated composite was used to indicate physical educators' self-efficacy for regular exercise, which could theoretically range from 0 to 1,800. The Self-Efficacy for Regular Exercise Questionnaire displayed a high level of internal consistency with a Cronbach's alpha of .94 among physical educators in this study.

Habitual physical activity. The International Physical Activity Questionnaire-Short Form (IPAQ-SF) was used to measure physical educators' self-reported PA and sedentary time (Craig et al., 2003). The IPAQ-SF is a 7-day recall instrument that asks participants to report time spent in four PA categories and the number of days that they engaged in a typical week for each category: (a) walking/light PA, (b) moderate PA, (c) vigorous PA, and (d) sitting (i.e., sedentary time). Physical educators were asked to reflect upon all activities in which they typically participated within a week including occupational and other planned (e.g., exercise) and unplanned (e.g., housework) PA. Craig et al. (2003) tested IPAQ-SF for an adult population and reported acceptable reliability (ρ =.76) and concurrent validity (ρ = .67).

Data Analysis

Prior to statistical analyses, the IPAQ data were formatted using the following established guidelines (Craig et al., 2003): walking/light PA = 3.3 MET, moderate PA = 4.0 METs, and vigorous PA = 8.0 METs. Using these guidelines, the daily MET-minutes were calculated for light PA, moderate to vigorous PA (MVPA), and total weekly MET-minutes based on the online survey data for the participants. These variables represent participants' habitual PA for statistical analyses.

The researchers ran descriptive statistics on physical educators' self-efficacy for exercise, years of teaching experience, and PA variables. The 95% confidence interval (CI) for these variables was estimated using random sample bootstrapping. Then, the Pearson product–moment correlations were computed between physical educators' self-efficacy for exercise, years of teaching experience, and PA variables. Finally, the researchers conducted a multiple regression analysis with physical educators' daily MVPA as the dependent variable and their gender, race/ethnicity, perceived weight status, years of teaching experience, and self-efficacy as independent variables to determine the predictive value of these variables for physical educators' daily MVPA. Finally, based on the regression results, the researchers computed the effect size (f^2) to determine the predicting magnitude.

Results

Table 1 shows the descriptive statistics including mean, standard deviation, min, max, and 95% CI of the PA, self-efficacy, and years of teaching. On average, the physical educators demonstrated a daily sedentary time of 151.54 min, light PA of 60.62 min, MVPA of 56.11 min, and an estimated weekly 3,521.75 MET-minutes. Based on the average daily MVPA minutes and the estimated total weekly MET-minutes (> 3,000), the physical educators demonstrated a high level of PA participation. In addition, physical educators reported relatively high self-efficacy for exercise, M = 1127.05, SD = 362.76. Table 2 presents the Pearson product–moment correlation coefficients between PA, self-efficacy, and years of teaching. Physical educators' sedentary time had no or a low correlation with MVPA, total weekly MET-minutes, self-efficacy, or years of teaching. Weekly MET-minutes were highly positively correlated with daily MVPA (r = .85) and light PA time (r = .68). Self-efficacy demonstrated low to moderate positive correlations with weekly MET-minute (r = .27) and MVPA (r = .42). Years of teaching was negatively correlated with MVPA (r = -.31) and weekly MET-minute (r = -.32), but was not correlated with sedentary time or self-efficacy.

Table 1
Descriptive Results of Physical Activity, Self-Efficacy, and Teaching Experience

Variable	*M*	*SD*	Min	Max	95% CI
Sedentary (min·d^{-1})	151.54	102.68	10.00	540.00	[135.83, 165.92]
Light PA (min·d^{-1})	60.62	71.06	.00	400.00	[50.69, 71.42]
MVPA (min·d^{-1})	56.11	49.76	.00	270.00	[48.40, 64.18]
Weekly MET-minute	3521.75	2820.49	388.50	14958.00	[3114.50, 3991.79]
Self-efficacy for exercise	1127.05	362.76	291.00	1800.00	[1071.89, 1184.27]
Years of teaching	16.27	11.32	1.00	40.00	[14.53, 18.04]

Note. PA= physical activity; MVPA = moderate to vigorous physical activity; CI = confidence interval.

Table 2
Correlation Coefficients Between Physical Activity, Self-Efficacy, and Teaching Experiences

Variables	1	2	3	4	5	6
1. Sedentary (min·d^{-1})	1					
2. Light PA (min·d^{-1})	-.03	1				
3. MVPA (min·d^{-1})	-.07	.24**	1			
4. Weekly MET-minute	-.09	.68**	.85**	1		
5. Self-efficacy for exercise	-.18*	-.12	.42**	.27**	1	
6. Years of teaching	-.01	-.21**	-.31**	-.32**	.02	1

Note. PA = physical activity; MVPA = moderate to vigorous physical activity.

*$p < .05$. **$p < .01$.

In light of the high correlation ($r = .85$) between daily MVPA and weekly MET-minute, the researchers conducted a multiple regression analysis with physical educators' daily MVPA as the dependent variable and gender, ethnicity, perceived weight status, years of teaching, and self-efficacy as independent variables. As Table 3 shows, a significant amount of the variance in physical educators' daily MVPA was explained by the multiple regression model, $F(5, 139) = 10.22$, $p < .01$. Overall, the model explained about 24.3% of the variance in physical educators' MVPA. According to Cohen (1988), this result ($f^2 = .32$) indicates a medium to borderline large effect size ($f^2 \geq .35$). Years of teaching emerges as a significant nega-

tive predictor (β = -.35, p <. 05) but self-efficacy as a positive predictor (β = .39, p < . 05) of physical educators' daily MVPA. The other independent variables including gender, ethnicity, and perceived weight status were not significant predictors in the regression model.

Table 3
Multiple Regression Results Predicting Moderate to Vigorous Physical Activity (Min/Day)

	Adjusted R^2 = 24.3%, $F(5, 139) = 10.22$, $p < .01$				
Predictors	***B***	SE_B	β	***t***	***p***
Intercept	22.91	26.79	—	.86	.39
Gender	.02	7.96	.00	.00	.99
Race/ethnicity	-.32	5.31	-.01	-.06	.95
Perceived weight status	-.94	8.27	.01	-.11	.91
Years of teaching	-1.41	.32	-.35	-4.37	.00
Self-efficacy for exercise	.05	.01	.39	5.23	.00

Discussion

The purpose of this study was to examine PE teachers' habitual PA and self-efficacy for regular exercise. This study represents an important step toward quantifying physical educators' total PA participation and identifying the contribution of self-efficacy, among other factors. Results of this study provide empirical evidence about the role self-efficacy for regular exercise, as well as several sociodemographic factors, plays in predicting habitual PA among PE teachers.

The findings of this study demonstrate that self-efficacy for regular exercise can be an important factor in promoting PA participation among in-service physical educators. These findings are consistent with population-level studies that demonstrate a significant positive relationship between self-efficacy and habitual PA in other populations (Dishman et al., 2005; McAuley & Blissmer, 2000; McAuley et al., 2005). Bandura (1997) specifically referenced self-efficacy as a key to success in regular exercise and suggested that this construct is the preeminent determinant of consistent health-promoting levels of PA. Because physical educators should normally be aware of the health-related benefits of PA participation (occupational

knowledge), it is not surprising that the participants in this study had strong beliefs in their ability to be active and garner these benefits (Anderson, Wojcik, Winett, & Williams, 2006). According to Bandura (1997), self-efficacy is influenced by personal variables (e.g., age, gender) and environmental variables (e.g., social support). Further research examining the habitual PA and self-efficacy for regular exercise of in-service physical educators may consider exploring additional variables such as social support to further understand constructs that influence these health-related behaviors.

The physical educators in this study demonstrated high levels of PA participation. Because of the value placed on PA among physical educators and the knowledge, skill, and confidence associated with physically literate professionals (SHAPE America, 2014), it is not surprising that the participants were highly physically active. This finding is important because of the impact that a teacher as a role model can have on student populations (Klopfenstein, 2005). According to Conlin (2014), physically active teachers are recognized by their pupils as role models of physical literacy and can encourage youth to become physically literate when they move competently during classes. Furthermore, Senne, Rowe, Decker, Douglas, and Boswell (2006) found that teachers with active lifestyles can influence the PA of students. For these reasons, physical educators' engagement in PA and students observing these behaviors can act as important variables in influencing student activity. In this sense, physical educators can increase student PA participation not only through improving their own physical skills (Zhu & Chen, 2013), but also through showing their own PA behaviors, serving as a role model. Unfortunately, years of teaching experience acted as a significant negative predictor of PA, meaning that those who taught longer were likely to be less physically active. This suggests that while progressing through their careers, physical educators become less effective role models for PA behavior for their students, which is echoed in findings with professional sport role models (Mutter & Pawlowski, 2014).

Results from this study conflict with some population-level research in the United States pertaining to the effect of several sociodemographic variables on the habitual PA in adult populations. For example, population-level research in the United States has demonstrated that adult males tend to be more physically active than

adult females (Carlson, Fulton, Pratt, Yang, & Adams, 2015; Centers for Disease Control and Prevention, 2014). Additionally, nationally representative research demonstrates that PA is inversely associated with self-reported weight status among American adults (Pate, Ross, Liese, & Dowda, 2015). However, in this study, gender and perceived weight status were not significant predictors of the participants' PA. Occupational expectations associated with the PE teacher profession, such as work-related PA and/or fitness knowledge, may have contributed to these results.

Not only are physical educators likely to have a predisposition toward being physically active, but also their professional preparation requires that they acquire, refine, and demonstrate physical and sport skills that demand PA participation. Furthermore, professional knowledge (e.g., knowledge necessary to be a physically active individual) associated with the PE teacher profession (NASPE, 2008; SHAPE America, 2014) can also contribute to lessening PA differences among these population subsets. Previous literature suggests that physical educators tend to experience bouts of vigorous PA periods (Trudeau et al., 2015) and stress on the cardiovascular system (Sandmark et al., 1999) throughout the school day. These bouts of occupational PA, which are likely to be experienced by physical educators equally across gender and weight status, may obscure the differences among habitual PA levels between groups. Based on these factors, it appears that female physical educators, who reported comparable amount of PA with their male counterpart, have higher PA levels than regular female adults.

A number of limitations are evident in this study and may serve as a precaution for interpretation of the research findings. First, the study used IPAQ, a self-report instrument, rather than an objective PA monitor to measure PA. However, utilizing the self-report instrument allowed the researchers to gather data from a large number of physical educators in an economically and time efficient manner (Haskell, 2012). Second, the sample was limited to physical educators who volunteered to participate in the research and had the capability to access the online survey. Because of this, the results may not accurately represent the U.S. population of physical educators.

In light of these limitations, future studies should consider using objective PA measures to quantify PE teachers' occupational PA and

recreational or voluntary PA. Quantifying these two types of PA would help to further the understanding of the positive relationship between self-efficacy and PA that exists among PE teachers (Kruger, Yore, Ainsworth, & Macera, 2006). Additionally, future studies could look at self-efficacy, PA, and other health-related indicators to determine the relationship of these variables and help further the understanding of the occupational, health, and behavioral aspects of the profession. Because years of teaching experience is a negative predictor for PA, it would also be meaningful for researchers to examine the association between PA and longevity of teaching careers.

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