



## Classroom Teachers' Practices of Physical Activity in 4th Grade Physical Education and Game Course

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### Abstract

**Purpose:** The purpose of this study was to determine if student engagement in physical activity, lesson context/content, teacher involvement, and teacher interaction during Physical Education and Game course in elementary school changed as a function of teacher sex and years of teaching experience. **Method:** A convenience sample of classroom teachers from Şanlıurfa, Turkey, took part in the study. A direct observation tool, the System for Observing Fitness Instruction Time, was used to collect the data. **Results:** Although small differences were observed regarding sex and teaching experience for some subcategories of observation, the results showed that the students were standing, the context/content of the lesson was a game play, the teachers were observing the students, and they did not promote in-class and out-of-class physical activity during the greatest percentage of 4th grade Physical Education and Game lessons. **Conclusion:** It has been concluded that the practices that will support the physical activity and physical fitness levels of the students in the Physical Education and Game classes taught by the classroom teachers are found to be insufficient.

### Keywords

Physical education and game  
Physical activity  
Direct observation  
Classroom teacher  
SOFIT

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### Introduction

Obesity, defined as abnormal or excessive fat accumulation that poses a risk to health and whose prevalence has increased at an alarming rate, has been identified as one of the most serious global health problems for adults and children in the 21st century (World Health Organization [WHO], 2020). According to WHO, the rate of childhood obesity has nearly tripled worldwide since 1975. In 2016, more than 340 million children and adolescents aged 5-19 years were overweight or obese, and it has been reported that overweight and obese children are more likely to remain obese in adulthood and develop non-communicable diseases such as diabetes, cardiovascular disease, and various cancers at a younger age; that the prevention of childhood obesity is a high priority because overweight and obesity and related diseases are largely preventable (WHO, 2020, 2021).

Childhood obesity is mainly associated with an unhealthy diet and an inactive lifestyle, and it is emphasized that controlling these two factors will prevent obesity (WHO, 2020). To combat the childhood obesity epidemic, it is recommended that children engage in at least 60 minutes of regular,

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moderate to vigorous physical activity (MVPA) daily (WHO, 2010), and it is noted that schools are among the places that provide context and contribute to regular and structured physical activity (PA), as school-aged children are enrolled in and regularly attend classes that provide a controlled and structured learning environment for them (McKenzie & Lounsbery, 2014). In such an environment, students' positive attitudes, awareness, and participation in regular PA both within the classes and in out-of-school settings (i.e., athletic practices, sports tournaments, and festivals) will increase (Fairclough & Stratton, 2005; Lee, Burgeson, Fulton, & Spain, 2007). Throughout the world, the positive impact of schools on behavior change in children and adolescents is emphasized and highlighted that change in PA behavior can be achieved through school physical education (PE) (Pate, Pfeiffer, Trost, Ziegler, & Dowda, 2004; WHO, 2004). Researchers have mentioned that school PE is the starting point for lifelong PA participation as it provides knowledge, skills, and early PA experiences for students (McLennan & Thompson, 2015). For this reason, schools are recommended to develop activities that promote PA within the formal curriculum and outside the classroom (Lee, 2004; WHO, 2020).

The goals to improve PA participation and promote lifelong PA habits in children are addressed in general and in the school curriculum in PE (Corbin, Pangrazi, National Association for Sport and Physical Education, & National Association for Sport and Physical Education, 2004; Ministry of National Education [MoNE], 2018). For example, one of the various targeted goals of the National Elementary Physical Education (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> grade) curriculum (course named "Physical Education and Game" [PE & Game]) in Turkey include the vision that "students will be able to explain the concepts and principles of play and physical activity in order to be healthy and improve their physical fitness; apply these concepts and principles, and participate regularly in games and physical activities." Although learner-content interaction is of great importance in achieving these goals, learner-teacher interaction is also crucial in developing students' acquisition of knowledge and skills related to PA and flexible practical application of the acquired knowledge and skills in a variety of contexts inside and outside school (İnce & Hünük, 2013; Johnson, 1981; Johnson & Johnson, 1985). In such a case, PE teachers are required to maintain strong PE programs that promote student engagement at the recommended level of PA before, during, and after the school day (Faber, Kulinna, & Darst, 2007; WHO, 2018). The key to the positive impact of PE instruction on children and adolescents in terms of PA-related knowledge, skills, and attitudes lies in the ability and willingness of teachers to select and apply the most appropriate instructional strategies, management techniques, and curriculum design to achieve instructional goals (Fairclough & Stratton, 2005; Kulinna, Silverman, & Keating, 2000). Moreover, it has been scientifically proven that the PA engagement level of students in PE classes can be increased through various intervention practices (Belansky, Cutforth, Kern, & Scarbro, 2016; McKenzie, Sallis, Faucette, Roby, & Kolody, 1993; McKenzie et al., 2001). In a meta-analysis based on studies of interventions designed to increase the rate of school PA engagement levels, researchers found that planned, appropriate intervention strategies increased students' PA engagement time in PE classes by 24% (Lonsdale et al., 2013).

Previous studies on school PE and school PA have focused, in part, on a descriptive examination of PE teachers' knowledge of health-related fitness, and the results of these studies have shown that the knowledge level of PE teachers is low (Castelli & Williams, 2007; Santiago, Disch, & Morales, 2012; Santiago, Morales, Disch, & Morrow Jr, 2016). Moreover, the information obtained from these self-reports provides data on PA that is far from revealing the contextual or behavioral effects known to influence PA behavior. For this reason, the translation of teachers' theoretical knowledge into practice on this topic has been revealed through various systematic observation methods (e.g., Rink & Werner, 1989 [Qualitative Measures of Teaching Performance Scale/QMTPS]; Stewart, 1989 [Observational Recording of Record of Physical Educator's Teaching Behavior/ORRPETB]). The System for Observing Fitness Instruction Time (SOFIT), which was found to be viable and was selected for use in this study, was one of the observational tools used to assess PE classes to collect data on student PA engagement, lesson context/content, and teacher behavior (teacher involvement, teacher interaction) (McKenzie, Sallis, & Nader, 1992). Several national and international studies using SOFIT have found that PE teachers spend a large portion of their PE class time on management and instructional activities, very

little time in their classes on MVPA that promotes student physical fitness and health; and rarely promote PA during PE lessons (Akin, Altay, & Saraç, 2008; Avcı & Altay, 2016; Hürmeriç, 2003; İrez, Yaman, Babayiğit İrez, & Saygın, 2013; McKenzie, Marshall, Sallis, & Conway, 2000). While these studies have generally been conducted at the secondary and high school levels where specialized PE teachers have been formally assigned to teach PE, studies have been limited, especially in Turkey, in elementary schools where classroom teachers have been responsible for teaching in multiple content areas, including PE (McKenzie & Smith, 2017; Milli Eğitim Bakanlığı Okul Öncesi ve İlköğretim Kurumları Yönetmeliği, 2014).

The National Education Policy on the Role and Responsibility of Teachers in Elementary School (Grades 1-4) in Turkey states that “it is essential that all instruction in elementary school be provided by classroom teachers. However, Foreign Languages, Religious Culture and Moral Knowledge courses are taught by specialist teachers in the school (if staff is available)” (Milli Eğitim Bakanlığı Okul Öncesi ve İlköğretim Kurumları Yönetmeliği, 2014). The Council of Higher Education [YÖK] has offered two courses (Physical Education and Sport Culture and Physical Education and Games; since 2018, instead of these two courses, a single course called Teaching Games and Physical Activities has taken its place in the program) for teacher candidates in the elementary teacher education program in order for classroom teachers to effectively deliver the PE & Game lessons (YÖK, 2012, 2018). Various studies on classroom teachers and the PE & Game course have revealed that the lessons taken by classroom teachers in the teacher training program are insufficient in terms of contributing to the efficient conduct of physical education lessons (Bozdemir, Çimen, Kaya, & Demir, 2015; Güven & Yıldız, 2014; Şentürk, Yılmaz, & Gönener, 2015). Classroom teachers, in studies in which they revealed their views on physical education lessons, stated that their physical education-related knowledge and skills were insufficient to properly deliver PE lessons, that the implementation of PE lessons they teach is far from the expected qualifications in terms of practice, and that PE lessons should be delivered by specialist PE teachers (graduates of PE teacher education programs) in order for students to achieve learning outcomes (Arslan & Altay, 2008; Bozdemir et al., 2015; DeCorby, Halas, Dixon, Wintrup, & Janzen, 2005; Morgan & Hansen, 2007; Pehlivan, Dönmez, & Yaşat, 2005). These findings clearly indicate that it does not seem possible for classroom teachers who believe the PE & Game course cannot be delivered effectively by classroom teachers and who believe that it should be delivered by specialist PE teachers to meet the PA needs of elementary school students and encourage students to become physically active throughout their lives. In addition to the findings of these studies, most of which are based on teachers’ self-reports, there is a clear need for research studies to find out the actual physical education practices of classroom teachers in elementary school PE & Game lessons (Barney & Deutsch, 2009; Fletcher & Mandigo, 2012; Morgan, 2008).

Research on factors affecting teaching has shown that teacher characteristics (i.e., educational level, experience, certification, attitudes, beliefs, and behaviors) are one of the most important factors contributing to student achievement (Kulinna et al., 2000). The relevant literature has shown that teachers’ sex and years of teaching experience are considered two of the factors that influence student PA engagement, teaching context/content, and teachers’ engagement during teaching PE, and the results of these studies showed different results between male and female teachers and teachers with different teaching experiences (McKenzie & Smith, 2017; Sutherland et al., 2016). In one of these studies, Chow, McKenzie, and Louie (2008) reported that students in secondary schools were more physically active in PE lessons taught by male teachers. In contrast, another study, reported the opposite, that children in male-led elementary school PE classrooms stand more and were less active (Skala, Springer, Sharma, Hoelscher, & Kelder, 2012). Regarding teaching experience, studies have shown that secondary students in the classrooms of experienced teachers are more physically active due to the fact that experienced teachers spend less class time on managerial activities compared to inexperienced teachers (Sutherland et al., 2016). In addition to the limited number of studies addressing the variables of teacher sex and teaching experience, the literature also found that no consistent conclusion could be drawn in these studies. There is a need to conduct further studies to better prove the influence of teachers’ sex

and their years of teaching experience on students' level of PA engagement, lesson context/content, teacher involvement, and teacher interaction in elementary level PE & Game classes.

Previous studies have shown that there are research findings on the PA engagement level of students in the classes of specialist PE teachers teaching at the secondary school and high school levels (Gill et al., 2016; Hürmeriç, Kirazcı, İnce, & Çiçek, 2005; Uzun & Özer, 2018), but there are hardly any studies on the PA engagement level of students in the PE & Game classes of classroom teachers, especially in Turkey. Although it is important to develop and encourage PA in PE classes and to disseminate research on this issue, there are limited observational studies on what kinds of practices are used to implement and encourage PA activity in PE classes. Therefore, the aim of this study is to determine whether student PA engagement, lesson context/content, teacher involvement, and teacher interaction differ during the elementary school PE & Game course according to the classroom teachers' sex and years of teaching experience.

## Method

### *Research Model*

In this study, a cross-sectional, descriptive research design was used and a quantitative research method was conducted. Studies designed in this model are observational surveys conducted where the researcher aims to collect data from a sample of the target population and is able to evaluate various variables at a given time (Fraenkel, Wallen, & Hyun, 2012).

### *Sample*

This descriptive-comparative quantitative observation was carried out on 123 Turkish classroom teachers who were chosen from 62 different public schools in the central districts of Şanlıurfa, Turkey, using a purposeful and convenient sampling procedure based on sex and years of teaching experience. The convenience sampling method was adopted because of resource restraints and the inclusion criteria for this study included participants who were easily accessible to the researcher, were available for the research, and working in a school that was located in areas that the researcher could easily reach. Of the 123 teachers, 62 (50.41%) were female and 61 (49.59%) were male. The mean age of the study participants was  $39.05 \pm 14.67$  years ( $\bar{x}_{female} = 37.65$ ,  $SD_{female} = 7.67$ ;  $\bar{x}_{male} = 40.48$ ,  $SD_{male} = 9.18$ ) and the mean teaching experience was  $14.67 \pm 7.82$  years ( $\bar{x}_{female} = 13.71$ ,  $SD_{female} = 7.70$ ;  $\bar{x}_{male} = 15.64$ ,  $SD_{male} = 7.89$ ). In terms of teaching experience, 32.52% ( $n = 40$ ) of the teachers had 1-10 years of experience ( $\%_{female} = 50$ ,  $\%_{male} = 50$ ), 34.96% ( $n = 43$ ) had 11-20 years ( $\%_{female} = 51.16$ ,  $\%_{male} = 48.84$ ), and 32.52% ( $n = 40$ ) had 21-30 years ( $\%_{female} = 50$ ,  $\%_{male} = 50$ ) during the study period. For the purpose of the present study, only 4<sup>th</sup> grade classes were observed. Before beginning the research, it was concluded that observing the PE & Game classes of 4<sup>th</sup> grade students would be more appropriate in terms of getting data on organized lessons, based on the perspectives received from the classroom teachers. A total of 492 (246 girls, 246 boys) were observed during the study period. Although students in the observed classes were not asked to provide information about their age, the age range of students was estimated to be 9 to 10 years old based on Turkish MoNE (Milli Eğitim Temel Kanunu, 1973).

### ***Data Collection Instruments***

The Demographic Information Form and the System for Observing Fitness Instruction Time (SOFIT; McKenzie et al., 1992) were used to collect the data.

#### ***Demographic Information Form***

Demographic information was gathered using a Demographic Information Form, which included information on teachers' sex (female, male), age (in years), and years of teaching experience (1-10 years, 11-20 years, 21-30 years). The form was prepared by the researchers within the scope of the research purpose, based on the relevant literature. The form was completed by the researcher by asking questions and recording the participant's answers. Demographic data was collected before the data collection procedures. It took 1-2 minutes to complete the form.

#### ***System for Observing Fitness Instruction Time***

The System for Observing Fitness Instruction Time (SOFIT; McKenzie et al., 1992) was used to collect physical activity-related data during elementary level PE & Game classes. SOFIT is a valid, direct, and comprehensive observation tool designed for use in PE classes to assess the proportion of student PA engagement, the context/content of the lesson, the teacher's involvement, and the teacher's interaction during the PE class time to be observed and coded. As mentioned above, SOFIT consists of a 4-stage decision system (McKenzie et al., 1992). The first stage includes coding the "physical activity" level of the student in 5 dimensions (lying down= 1, sitting= 2, standing= 3, walking= 4, vigorous= 5). This stage provides information on the student's physical activity intensity. If the student does not spend more energy than is required for a normal walk, one of the options for lying down, sitting, standing, or walking according to the body position of the student, and if the student spends more energy than he would spend during normal walking (running, jumping, etc.), the vigorous option is selected. In the "lesson context/content" section, which is the second stage of the decision series, coding is done in six dimensions (management= M, knowledge= K, fitness activity= F, skill practice= S, game play= G, other=O) for how the course content is conveyed. Management refers to the duration of the lesson in which students are not intended to be included in the content of the PE lesson (administrative activities, material change, station changing, team building, etc.); knowledge refers to the duration of the course during which students acquire knowledge about the PE lesson; fitness refers to the class time devoted to activities (warm-up/cool-down movements, endurance running, aerobic dance, weight training, etc.) that will change the physical condition of the student in terms of cardiovascular endurance, strength, flexibility; skill practice refers to class time devoted to exercises for skill development (volleyball passing skill, dance steps skill, etc.); game play refers to class time devoted to practicing skills in a game or competitive activity; and other refers to class time devoted to free (with or without student participation) play where physical education teaching is not intended. In the third stage, "teacher involvement," the teacher's participation in the lesson is evaluated in 6 dimensions (promotes fitness= P, demonstrates fitness= D, instructs generally= I, manages= M, observes= O, other-task= T). Promotes fitness refers to class time when the teacher supports physical fitness; demonstrates fitness refers to class time when the teacher demonstrates how to do physical fitness skills or participates in physical fitness activities with students; and instructs generally refers to class time when the teacher provides information and feedback on applied skills other than physical fitness; manages refers to the duration of the lesson during which the teacher is engaged in tasks outside the subject of the lesson or manages the students or the environment; observes refers to the duration of the lesson where the teacher watches the whole class, group or a student; and the other task refers to the lesson time spent by the teacher on activities that are not related to his/her responsibilities for the lesson (telephone calls, meeting with school personnel, reading the newspaper, etc.). The fourth stage of the observation form is the "teacher interaction", which is related to the teacher's promotion of physical activity and physical fitness, and is examined in 3 dimensions (Promotes in class PA/fitness= I, promotes out-of-class PA/fitness= O, no PA/fitness promotion= N). Promotes in-class PA/fitness refers to class time when the teacher promotes physical activity, motor skills, or physical activity in the classroom; Promotes out-of-class PA/fitness refers to class time when the teacher supports physical activity, motor skills, or physical activity outside of the classroom; and No PA/fitness promotion refers to the duration of the lesson when

the teacher does not support physical activity, motor skills or physical activity in or out of the classroom. The SOFIT Recording Form was used to collect data on these four behavioral dimensions at 20-second intervals (10-second observation and 10-second recording). Because fast movements could not be detected with the naked eye within seconds in a lesson taught without pauses and with no outside interference from researcher, data loss could occur. The lessons were recorded with a video and audio recorder to eliminate such a potential problem and to allow the movements to be reviewed later.

### *Procedures*

Permission for the study was obtained from the Institutional Ethics Committee at Mersin University, Turkey. Permission to conduct the study in elementary schools was also obtained from the MoNE District Office. The school principals ( $n= 63$ , one principal refused to allow video recording of the lesson), classroom teachers ( $n=124$ ), and parents of the students ( $n= 496$ ) were informed about the study, and their consent to participate was obtained. Teachers who were working in the schools during the study period and volunteered to participate were included in the study. All data were collected over the course of one semester, during the spring semester of the academic year. All the 123 lessons observed in the research were taught in the open areas of the school garden. The course content was not interfered with within the scope of the research, and the teachers mostly preferred “game” for the PE & Game course. It was suggested that teachers teach in a way that would remain within the scope of the MoNE curriculum.

Classroom observations were conducted with a maximum of two teachers (one female and one male) from each of the 62 selected schools. The researcher arranged with volunteer teachers at the target schools before the formal data collection began and scheduled an appropriate time for the classroom observations. Teachers selected for observation were asked to identify a complete 40-min instructional PE sequence provided in the 4<sup>th</sup> grade PE & Game curriculum. A total of 124 PE & Game classes were recorded, but since one of the classes only contained theoretical information and lasted less than 10 minutes, this recorded class was not included in the analysis. To minimize data loss and capture all reflections, lessons were video and audio recorded with teacher permission. All recordings were made using a Panasonic AVCCAM AG-AC90A video camera and a Sony Corporation 1-7-1 Konan Minato-Ku audio recorder. The digital video camera was placed on a tripod in a suitable location that could cover the entire PE teaching area. During observation and video/audio recording, care was taken to ensure that teachers and students were minimally disturbed by the presence of the video camera, audio recorder, and researcher.

The observation process began with 50% of the class arriving at the PE environment and the classroom teacher guiding students to a location where instruction was to take place. The observation and recording scheme continued until the PE & Game class was over. Based on the fact that in the PE & Game class, the whole class would act and participate in activities at the same time, a total of four randomly selected students (2 girls and 2 boys) from each class were chosen for observation during the SOFIT application before the start of the PE & Game class. One student and one classroom teacher were observed every 12 intervals (1 interval= 10 seconds of observation-10 seconds of recording) in accordance with the subcategories of student PA engagement, lesson context/content, teacher involvement, and teacher interaction within a class. This process continued throughout the 40-minute PE & Game lesson.

For intra-rater reliability of videotaped PE & Game classes with use of the SOFIT instrument, 12% of the recorded videos were randomly selected and scored by the same coder (researcher) at two different time points and the results were calculated by comparing the results of these two coded videos (McKenzie et al., 1992). In addition, inter-rater reliability was also tested by two trained coders (a researcher and a trained PE teacher). During the training of the coders, the researcher who will do the coding gained the knowledge, skills, and experience to fill out the observation form by observing 3 randomly selected videotaped lessons. Following this, the researcher first informed the second coder about the SOFIT observation form, introduced the observation form, and the researcher and the second coder observed the 3 class recordings, and practiced filling out the observation form together. When the

knowledge and skills of the two coders were acquired and the consistency between their codes were observed, the actual coding started (Graham, Milanowski, & Miller, 2012). As with intra-rater agreement, 12% of the recorded lessons were independently selected, observed, and coded. Both intra- and inter-rater reliability were tested and determined using van der Mars' (1989) reliability formula ( $\text{agreements}/(\text{agreements} + \text{disagreements}) \times 100$ ). Intra-rater and inter-rater reliability for PA engagement (95.60%-93.79%), lesson context/content (96.56%-95.91%), teacher involvement (94.00%-92.77%), and teacher interaction (96.41%-95.47%) were calculated to be high.

### **Data Analysis**

Prior to data analysis, the percentage of intervals for each behavior was calculated using the SOFIT instrument. Since the distribution of the data was significantly different from normal, nonparametric statistics were used for the data analysis. The nonparametric *Mann-Whitney U* test was used to compare the differences between two groups of teachers (female and male) in terms of student PA engagement, lesson context/content, teacher involvement, and teacher interaction. The *Kruskal Wallis* test was used to compare differences in the same variables between three groups with teaching experience (1-10 years, 11-20 years, and 21-30 years). SPSS version 20.0 software (SPSS for Windows, SPSS Inc., Chicago, IL, USA) was used to analyze all data.

## **Results**

The purpose of this study was to investigate whether student PA engagement, lesson context, teacher involvement, and teacher interaction changed during the elementary school PE & Game course according to teachers' sex and years of teaching experience. The Mann-Whitney U test showed that there were no statistically significant differences between female and male classroom teachers on the dimensions of "lying down," "sitting," "standing," "walking," and "vigorous" from *student PA engagement*; "management," "knowledge," "fitness activity," "skill practice," "game play," and "other" from the dimension of *lesson context/content*; "promotes fitness," "instructs generally," "manages," "observes," and "other-task" from the *teacher involvement* dimension; and "promotes in-class MVPA," "promotes out-of-class MVPA," and "no promotion" from the *teacher interactions* dimension (see Table 1). However, a significant difference was found between female and male teachers with respect to the "demonstrates fitness" from the *teacher involvement* dimension. Analysis revealed that the percentage of time spent on demonstrating fitness in the teacher involvement dimension was greater for male teachers than female teachers (see Table 1).

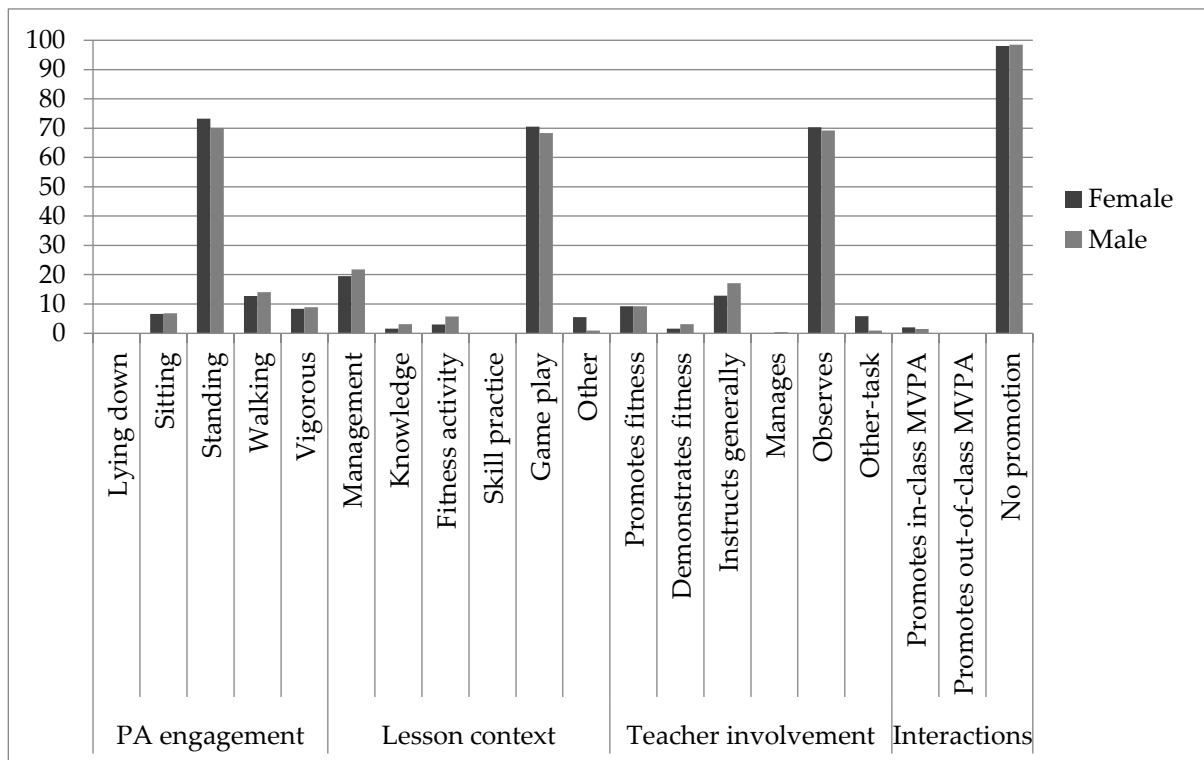
**Table 1.** Sex Differences in the Student PA Engagement, Lesson Context/Content, Teacher Involvement and Teacher Interaction

	Gender	<i>n</i>	$\bar{x}$	<i>SD</i>	<i>Mdn</i>	<i>z</i>	<i>U</i>
<b>Student PA engagement</b>							
Lying down	Female	62	0.00	0.00	.00	-1.01	1860.00
	Male	61	0.06	0.45	.00		
Sitting	Female	62	5.61	13.09	.00	-.66	1769.00
	Male	61	6.86	17.81	1.92		
Standing	Female	62	73.24	17.48	75.52	-.52	1788.50
	Male	61	70.11	20.90	76.53		
Walking	Female	62	12.78	10.08	10.38	-.28	1835.00
	Male	61	14.04	12.57	9.84		
Vigorous	Female	62	8.38	7.68	7.22	-.33	1825.00
	Male	61	8.94	7.70	6.78		
<b>Lesson context/content</b>							
Management	Female	62	19.46	13.47	16.49	-.69	1755.00
	Male	61	21.78	15.83	17.98		
Knowledge	Female	62	1.55	2.59	.00	-.10	1874.50
	Male	61	3.16	11.56	.00		
Fitness activity	Female	62	2.99	6.74	.00	-1.91	1588.00
	Male	61	5.79	10.90	.00		
Skill practice	Female	62	0.00	.00	.00	.00	1891.00
	Male	61	0.00	.00	.00		
Game play	Female	62	70.53	22.35	77.72	-.63	1767.50
	Male	61	68.38	22.75	72.50		
Other	Female	62	5.47	16.14	.00	-1.43	1649.50
	Male	61	0.88	2.00	.00		
<b>Teacher involvement</b>							
Promotes fitness	Female	62	9.29	14.44	2.60	-1.12	1672.00
	Male	61	9.27	11.72	3.45		
Demonstrates fitness	Female	62	1.64	3.86	.00	-2.42	1468.50*
	Male	61	3.13	5.98	.87		
Instructs generally	Female	62	12.86	8.95	9.81	-1.95	1506.50
	Male	61	17.07	11.90	14.81		
Manages	Female	62	0.00	0.00	.00	-1.76	1798.00
	Male	61	0.37	2.00	.00		
Observes	Female	62	70.35	22.43	76.61	-.93	1708.50
	Male	61	69.23	17.61	68.29		
Other-task	Female	62	5.86	17.22	.00	-1.37	1658.50
	Male	61	0.93	2.20	.00		
<b>Teacher interactions</b>							
Promotes in class PA/fitness	Female	62	1.99	6.90	.00	-.20	1861.50
	Male	61	1.46	5.21	.00		
Promotes out-of-class PA/fitness	Female	62	0.00	.00	.00	.00	1891.00
	Male	61	0.00	.00	.00		
No PA/fitness promotion	Female	62	98.01	6.90	100	-.20	1861.50
	Male	61	98.54	5.21	100		

\* $p < .05$



Although there is a difference between male and female teachers in terms of “demonstrating fitness”, it is noticeable that the amount of time spent on demonstrating fitness by both female and male teachers is low (see Figure 1). In addition, the measure of student PA engagement showed that teachers of both sexes spent the greatest percentage of instructional time in PE & Game class time “standing” ( $\bar{x}_{female}= 73.24$ ;  $\bar{x}_{male}= 70.11$ ). The SOFIT data also showed that most of the instructional time was spent by teachers in “game play” ( $\bar{x}_{female}= 70.53$ ;  $\bar{x}_{male}= 68.38$ ). Another important finding regarding the PE & Game class time is that teachers spent most of the lesson is teacher involvement in “observing” ( $\bar{x}_{female}= 70.35$ ;  $\bar{x}_{male}= 69.23$ ). Both female ( $\bar{x}= 98.01$ ) and male ( $\bar{x}= 98.54$ ) teachers did not encourage students to move during or outside of class (see Figure 1).



**Figure 1.** Average Percentage of Class Time Spent in Each SOFIT Category with Respect to Teachers' Sex

According to the Kruskal-Wallis H-test, there was no significant difference between the years of teachers' teaching experience on the dimensions of “lying down,” “sitting,” “standing,” “walking,” “vigorous” from the dimension of *student PA engagement*; “management,” “knowledge,” “fitness activity,” “skill practice,” and “game play” from the dimension of *lesson context/content*; “promotes fitness,” “demonstrates fitness,” “manages,” and “observes” from the *teacher involvement* dimension; and “promotes in class PA/fitness,” “promotes out-of-class PA/fitness,” and “no PA/fitness promotion” from the *teacher interactions* dimension (see Table 2). However, a statistically significant difference among the three groups with teaching experience was found for “other” from the *lesson context/content* dimension; and for “instructs generally” and “other task” from the *teacher involvement* dimension (see Table 2).

**Table 2.** Teaching Experience Differences in the Student PA Engagement, Lesson Context/Content, Teacher Involvement and Teacher Interaction

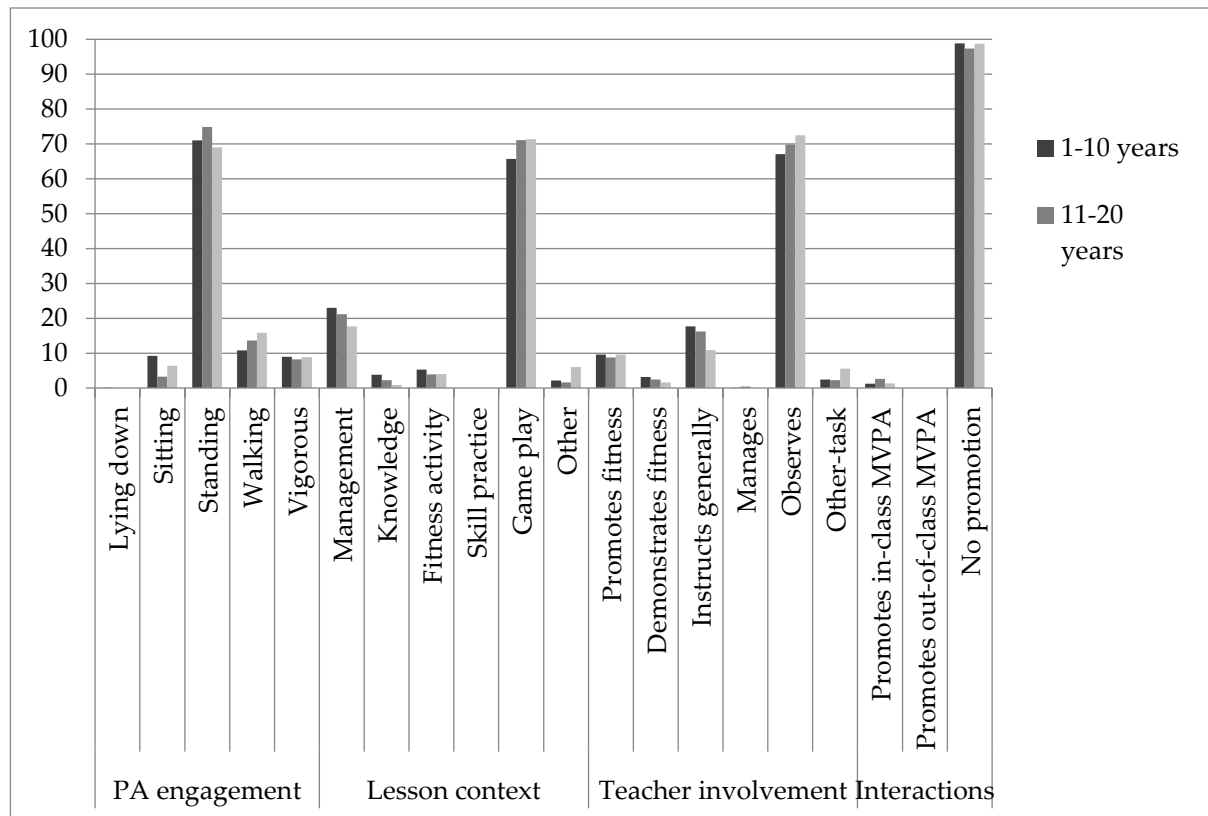
		<i>n</i>	$\bar{x}$	<i>SD</i>	<i>Mean Rank</i>	<i>X</i> <sup>2</sup>
Student PA engagement						
Lying down	1-10 years	40	0.09	0.55	63.04	
	11-20 years	43	0.00	0.00	61.50	2.07
	21-30 years	40	0.00	0.00	61.50	
Sitting	1-10 years	40	9.20	21.49	63.34	
	11-20 years	43	3.30	4.91	58.99	.54
	21-30 years	40	6.40	15.84	63.90	
Standing	1-10 years	40	71.01	22.35	63.05	
	11-20 years	43	74.85	16.31	66.47	1.79
	21-30 years	40	68.95	18.78	56.15	
Walking	1-10 years	40	10.75	10.71	52.85	
	11-20 years	43	13.66	11.29	62.55	4.95
	21-30 years	40	15.79	11.76	70.56	
Vigorous	1-10 years	40	8.95	6.47	66.30	
	11-20 years	43	8.19	8.69	57.72	1.21
	21-30 years	40	8.86	7.75	62.30	
Lesson context/content						
Management	1-10 years	40	23.02	16.89	67.40	
	11-20 years	43	21.14	13.69	63.60	2.60
	21-30 years	40	17.63	13.07	54.88	
Knowledge	1-10 years	40	3.85	14.01	63.21	
	11-20 years	43	2.28	3.45	69.08	5.56
	21-30 years	40	0.91	2.12	53.18	
Fitness activity	1-10 years	40	5.31	8.86	66.05	
	11-20 years	43	3.86	10.65	58.95	1.31
	21-30 years	40	4.01	7.63	61.23	
Skill practice	1-10 years	40	0.00	0.00	62.00	
	11-20 years	43	0.00	0.00	62.00	.00
	21-30 years	40	0.00	0.00	62.00	
Game play	1-10 years	40	65.71	23.70	56.14	
	11-20 years	43	71.15	20.78	63.99	1.65
	21-30 years	40	71.41	23.09	65.72	
Other	1-10 years	40	2.11	5.91	60.80	
	11-20 years	43	1.56	6.66	51.44	11.94*
	21-30 years	40	6.03	18.31	74.55	

**Table 2.** Continued

Teacher Involvement						
Promotes fitness	1-10 years	40	9.58	12.07	65.28	
	11-20 years	43	8.76	11.96	62.48	.81
	21-30 years	40	9.55	15.41	58.21	
Demonstrates fitness	1-10 years	40	3.13	6.84	65.72	
	11-20 years	43	2.43	4.73	62.92	1.49
	21-30 years	40	1.56	2.83	57.29	
Instructs generally	1-10 years	40	17.66	12.82	69.76	
	11-20 years	43	16.20	8.45	69.36	11.46*
	21-30 years	40	10.89	9.46	46.33	
Manages	1-10 years	40	0.09	0.60	62.01	
	11-20 years	43	0.44	2.32	63.38	1.90
	21-30 years	40	0.00	0.00	60.50	
Observes	1-10 years	40	67.07	17.30	54.84	
	11-20 years	43	69.83	18.47	60.98	3.80
	21-30 years	40	72.48	24.15	70.26	
Other-task	1-10 years	40	2.47	7.67	60.70	
	11-20 years	43	2.34	11.49	51.56	11.81*
	21-30 years	40	5.52	16.81	74.53	
Teacher interactions						
Promotes in class PA/fitness	1-10 years	40	1.21	2.69	65.40	
	11-20 years	43	2.60	9.25	61.85	1.28
	21-30 years	40	1.30	3.97	58.73	
Promotes out-of-class PA/fitness	1-10 years	40	0.00	0.00	62.00	
	11-20 years	43	0.00	0.00	62.00	.00
	21-30 years	40	0.00	0.00	62.00	
No PA/fitness promotion	1-10 years	40	98.79	2.69	58.56	
	11-20 years	43	97.40	9.25	62.15	1.28
	21-30 years	40	98.70	3.97	65.28	

\* $p < .01$ 

According to the Mann-Whitney U test, time spent on “other” activities in the *lesson context/content* dimension was greater among teachers with 21-30 years of teaching experience ( $Mdn = 1.02$ ) than among teachers with 11-20 years of teaching experience ( $Mdn = .00$ ) [ $U = 542.00$ ,  $z = -3.37$ ,  $p < .01$ ]; time spent on “instructs generally” in the *teacher involvement* dimension was greater among teachers with 1-10 years of teaching experience ( $Mdn = 17.14$ ) than teachers with teaching experience of 21-30 years ( $Mdn = 7.79$ ) [ $U = 505.00$ ,  $z = -2.84$ ,  $p < .01$ ]; time spent on “other-tasks” in the *teacher involvement* dimension was greater among teachers with teaching experience of 21-30 years ( $Mdn = 1.03$ ) than teachers with teaching experience of 11-20 years ( $Mdn = .00$ ) [ $U = 544.00$ ,  $z = -3.35$ ,  $p < .01$ ] (see Figure 2).



**Figure 2.** Average Percentage of Class Time Spent in Each SOFIT Category with Respect to Teachers' Teaching Experience

## Discussion

The purpose of this study was to determine whether student PA engagement, lesson context/content, teacher involvement, and teacher interaction during the 4<sup>th</sup> grade PE & Game classes differ according to the teachers' sex and years of teaching experience. Due to the limited number of studies that examined teachers' sex differences and teaching experience in terms of student PA engagement, lesson context/content, teacher involvement, and teacher interaction during the elementary PE & Game course, studies in which PE instruction was delivered by both classroom teachers and specialist PE teachers were included in the discussion of results. In relation to the sex variable, the research findings indicated that there were significant differences in the PE instructional time that female and male classroom teachers spent on the "demonstration of fitness" category of the SOFIT instrument, with female teachers spending 1.64% of instructional time on demonstration of fitness and male teachers spending 3.13% of instructional time. These results show a significant but small percentage difference in the amount of instructional time spent by female and male teachers in all other SOFIT categories. When examining the literature on the sex variable, it is noticeable that there are studies that support and do not support the findings of the current study (Gill et al., 2016; McKenzie et al., 2006). In a parallel study in the United States (US), McKenzie et al. (1995) observed student activity, lesson context/content, and teacher behavior using the SOFIT instrument in 3<sup>rd</sup> grade PE classes. The researchers found no sex differences in PE instructional time spent by PE specialized and general education teachers on PA engagement level and lesson context/content. Similarly, McKenzie et al. (2006) used the SOFIT instrument to examine girls' PA participation, time spent on lesson contexts, and PA promotion by teachers in middle school PE classes and found no sex effects on students' PA engagement levels or time spent on lesson contexts by PE teachers. The opposite of these findings was reported by Barnett, van Beurden, Zask, Brooks, and Dietrich (2002) in Australia, where no significant difference was found between female-and male-led 3<sup>rd</sup> and 4<sup>th</sup> grade elementary school PE classes in terms of PE time spent in class on MVPA. However, time spent on vigorous PA was found to be higher in female-

led PE classes than in male-led PE classes. Controversial results were also shown in another study (Chow et al., 2008), in which the MVPA percentage was higher in lessons taught by male PE teachers than by females in Hong Kong. Another study by Mersh and Fairclough (2010) in England examined 7<sup>th</sup> grade students' PA engagement levels, time spent in lesson context/content, and teacher behavior during PE specialist-led PE classes. The results of the different proportions of time spent on fitness demonstration tasks showed that there were significant sex differences, and those female PE teachers spent 10% more class time on fitness demonstration tasks than male PE teachers. Research in the US found that elementary school students in male-led PE classes, stood more, walked less, moved less, and played more than in female-led classes. In addition, researchers reported that female PE teachers spend less time on knowledge and skill activities than male PE teachers (Skala et al., 2012). A related study conducted in disadvantaged Australian secondary schools examined students' PA engagement level, lesson context/content, and teacher interaction using the SOFIT instrument in PE classes (Sutherland et al., 2016). The researchers in this study found that students' PA engagement levels were higher and students spent less time standing in male-led PE classes than in female-led classes.

Kulinna and Silverman (2000) found that teachers' behaviors related to school curriculum outcomes are influenced by their attitudes. In this study, the reason why female and male classroom teachers are similar in terms of time spent on PA engagement, lesson context/content, teacher behaviors, and teacher interactions could be because their attitudes and views toward PA are similar. The fact that female and male classroom teachers' attitudes and views toward PE and PA are similar is frequently found in national and international studies (Arslan & Altay, 2008; Barney & Deutsch, 2009; Saracaloglu, Bozkurt, Serin, & Serin, 2004). For example, in study examining classroom teachers' views of the PE curriculum and its practices, it was found that teachers' opinions were negative regardless of sex (Arslan & Altay, 2008). Moreover, the literature emphasizes that it is not the sex of the teacher but the availability of instructional materials in an educational setting that influences the teaching behaviors of both female and male teachers (Hastie & Saunders, 1991; Jansen, Jensen, & Mylov, 1972). In support of these findings, it has been reported in Turkey that both male and female teachers cannot deliver PE instruction in accordance with instructional objectives (Can-Ceylan & Dalaman, 2017; Mamak, 2012). The lack of indoor and outdoor facilities, equipment and materials, and inadequate knowledge are the main factors causing this situation (Pehlivan et al., 2005). Since, these inadequate facilities for effective PE teaching are similar in the schools of female and male teachers (Bozkurt & Tel, 2016; Can-Ceylan & Dalaman, 2017; Yıldız & Güven, 2014), it is assumed that no difference was found in SOFIT categories according to teachers' sex in this study. Although the in-service teachers participating in the current study graduated from different colleges of education and universities in Turkey (YÖK, 2012, 2018), elementary teacher education programs provided them with a basic standard curriculum and equal opportunities for women and men during elementary teacher education to ensure that teachers are adequately trained and equipped with knowledge, skills, and attitudes that enable them to effectively implement the MoNE (2018) curriculum and achieve curriculum goals. It may be that the inadequacies of this standard training program or the problems encountered in the educational process have not made any difference in the practices of female and male teachers.

Another objective of this study was to determine the changes in student PA engagement, time spent in lesson context/content, teacher involvement, and teacher interaction during PE & Game as a function of the teachers' years of teaching experience. The results showed a relationship between teachers' years of teaching experience and the lesson context/content, which provides information on how the course content is conveyed. According to the findings, teachers with 21 years or more of teaching experience spent more time on "other" activities that included free play time, where PE teaching is not intended, compared to teachers with 11-20 years of teaching experience. Similar associations were also found for teachers' teaching experience and the teacher involvement category of the SOFIT instrument, namely that teachers with 21 years or more of teaching experience spent more time on "other" tasks, which include activities unrelated to teachers' responsibilities to the PE class (i.e.

reading newspapers, making phone calls, talking to staff), compared to teachers with 11-20 years of teaching experience, and that teachers with the least experience (10 years or less) spent significantly more time on "general instruction" (i.e. giving instructional feedback, lecturing, describing) compared to teachers with 21 years or more of teaching experience. In contrast, no differences were found among the three groups of teachers with teaching experience in the other subcategories of PA engagement, lesson context/content, teacher involvement, and teacher interactions. Given the sparse evidence, more experienced teachers were reported to spend more time on MVPA, vigorous PA, and fitness activities and less time on management than less experienced teachers (Sutherland et al., 2016). In their study of the decision-making processes of experienced and inexperienced PE teachers, Housner and Griffey (1985) reported that experienced teachers used more alternative instructional strategies, used more instructional strategies, and gave less verbal instruction than inexperienced teachers. In another study, researchers examined the student PA engagement levels, lesson context/content, and teacher behaviors in paraeducators' PE classes and showed that different years of teacher training did not result in differences in student PA engagement levels, lesson context/content, or teacher behaviors (Hannon, Destani, McGladrey, Williams, & Hill, 2013). The results of the current study and other studies in the relevant literature do not suggest that sex and years of teaching experience affect teacher behavior in terms of student PA engagement, lesson context/content, teacher involvement, and teacher interaction during PE instruction. Indeed, teachers' sex and years of teaching experience appear to have the potential to influence these behaviors identified by the SOFIT instrument, but further research needs to be conducted to clarify the exact relationships.

When the research findings are considered in other SOFIT categories that do not differ by the variables of teachers' sex and years of teaching experience, the data related to student PA engagement, lesson context/content, teacher involvement, and teacher interaction show that for the majority of the PE lesson, students were primarily standing (more than 70% of the lesson time), the context/content of the lesson was primarily game play (more than 68% of the lesson time), teachers were primarily observing (more than 69% of the lesson time), and teachers did not promote MVPA inside and outside of class (more than 98% of the lesson time). There are studies that support the findings in this study about classroom teachers' practices in the PE lesson. In one such study conducted in the US (Hannon et al., 2013), researchers observed the PE practices of "paraeducators" whose role was to support the specialist teacher and who did not have sufficient knowledge of the PE curriculum. The results of their study showed no significant difference in the PE teaching practices of the three groups of teachers who had different years of teacher training experience (0 years, 1-3 years, and 4-7 years) in terms of class time spent on students' PA engagement, lesson context/content, and teacher behavior. In addition, consistent with the findings of the current study, the researchers reported that paraeducators spent 42.8% of the instructional time on students standing, 29.9% of the instructional time playing games, 28.4% on general content knowledge, 57.7% on general instruction, and 21.2% on management activities. In another study aimed at raising the PA engagement level of students in the classroom of elementary school teachers, most of whom were not specialists in the field of PE, Powell, Woodfield, and Nevill (2016) observed 3<sup>rd</sup> and 4<sup>th</sup> grade students during PE lessons in the United Kingdom. The results of their preliminary lesson observation showed that during PE lessons, pupils spent 36.74% of the lesson time standing, 29.15% walking, and 20.16% sitting. The classroom teachers spent 28.16% of PE instructional time playing games, 19.30% on knowledge, and 18.08% on management. Teachers did not promote PA either inside or outside the classroom for 79.89% of the instructional time. Furthermore, a study conducted in Brazil showed that during the PE course in 1<sup>st</sup> and 2<sup>nd</sup> grade, students spent 56.9% of the class time sitting and 21.3% of the class time playing games; in the same study, 36.9% of class time was spent on management and 29.25% on observation; and teachers devoted 55.86% of class time to playing games (Cunha, Poblacion, Colugnati, Taddei, & Bracco, 2016). A study in the US compared PE classes of PE specialists and classroom teachers in terms of 3<sup>rd</sup> grade students' PA engagement levels and lesson context/content using the SOFIT instrument (Nader, 2003). The results showed that students in the PE classes of classroom teachers spent more time standing (50.2% vs. 35.4%) and walking (26.6% vs. 21.4%)

than in the classes of PE specialists. In addition, the same study found that children taught by PE specialists spent more time practicing knowledge and skills but less time playing games than children taught by classroom teachers. Among the reasons for this situation is that teachers in PE classes emphasize play but do not make the necessary organizational decisions to prevent students from standing in line for a large portion of class time while games are organized and do not ensure maximum student participation (Faucette, McKenzie, & Patterson, 1990). Another reason for this situation could be the small number of lessons related to PE that classroom teachers complete during formal teacher education program, as well as the ineffectiveness of the training process for teachers to take responsibility for the elementary school curriculum (Morgan & Bourke, 2008). PE is prevented from playing a key role in teaching and promoting physical activity by a number of factors, including limited time allocation in the curriculum, low status of the subject, and inadequate resources (Jenkinson & Benson, 2010). In many studies, classroom teachers indicated that they had problems with PE teaching and that they could not effectively carry out the processes of planning, implementing, and evaluating effective PE teaching (Altun, 2016; Morgan & Hansen, 2007; Pehlivan et al., 2005).

Examining the results of this study and the studies on this topic in the existing literature, it is found that the PE lessons are not taught effectively by classroom teachers or non-specialized PE teachers (Arslan & Altay, 2008; Bozdemir et al., 2015; Morgan & Hansen, 2007; Pehlivan et al., 2005), but these negative results are similar in studies conducted with the participation of specialized PE teachers (Saraç-Yılmaz, İnce, Kirazcı, & Çiçek, 2005; Yıldırım, İnce, Kirazcı, & Çiçek, 2007). In a study conducted with a sample of Hong Kong students, when examining students' PA, lesson context/content, and teachers' behavioral dimensions in 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> grade PE classes, it was found that students spent 38% of PE instructional time standing and 35.9% walking. In addition, PE teachers spent 32.1% of instructional time on skill practice, 20.4% on fitness activities, 17.1% on knowledge, 16.8% on management, 59.4% on general instruction, and 18% on classroom management (Chow et al., 2008). According to the results of a study conducted in Mexico, it was found that the PA engagement level of students in elementary school PE classes was lower than recess time and that students were walking in 28% of PE class time and standing in 19.7%. 34% of instructional time in PE classes was game play, and 23% was management time (Jennings-Aburto et al., 2009). Another study on this topic was conducted in secondary schools in Portugal and showed that seven teachers observed spent most of their PE class time walking (34.4%) and standing (28.5%). They devoted most of their class time to playing games (30.9%) and managing (22.4%). The same study also found that in the PE class, the highest percentage of time (51.9%) was spent on general instruction and class management (23.7%) (Marques, Ferro, Martins, & Costa, 2017).

Several limitations should be considered when interpreting the study results. The selection of a small group of inservice classroom teachers using convenience sampling was one of the limitations of this study, which limits the generalizability of the findings to other contexts and has the potential for fewer objective comparisons than would be the case with a random and larger sample. Another limitation of this study was its observational nature. Participants were aware that they were being studied, observed, and recorded, which could influence and change their actual teaching behaviors. These processes could have had a positive or negative effect on the teachers' instructional performance, and they could have performed above or below their typical performance. During the PE & Game class observations, no suggestions were made and no restrictions were placed on what topic teachers should cover in their lessons. Thus, each teacher taught within the standard curriculum. Considering that each teacher's lesson was observed on a different day and that each teacher covered a different topic during the observation, this difference between the lesson content taught during the PE & Game lessons should also be considered a limitation as it may have influenced the research findings. Although the findings should be interpreted with caution, the strengths of this study are also worth mentioning. The current research went beyond the studies based on surveys and teacher statements regarding the primary school PE & Game classes and revealed data on actual classroom practices of teachers in a school setting. While there are a limited number of observational studies on PE teachers' school PE practices at the

secondary and high school levels, these studies are almost non-existent at the elementary school level. Therefore, another strength of this research is that it contributed to the literature on this subject and filled the gap on this issue at the elementary school level.

### **Conclusion**

The results of the present study indicated that students were standing, the context/content of the lesson was game play, and classroom teachers were observing and did not promote in-class and out-of-class MVPA during the greatest percentage of 4<sup>th</sup> grade PE & Game classes. Also, this study provided evidence that in elementary school PE & Game classes, which are expected to provide students with knowledge and skills about active and healthy living from an early age, children's current PA engagement level lags far behind the recommended and expected PA engagement level. Moreover, the teachers did not prepare learning environments during PE & Game lessons that would raise the PA engagement levels of the students and provide them with healthy living experiences, and they did not exhibit teacher behaviors that would be conducive to such successes. Student PA engagement, course content, teacher behavior, and teacher interaction were partially dependent on the sex and years of teaching experience of the teachers involved in the study. This study supports the view expressed in the literature that teachers do not feel able to meet the curriculum objectives of the PE & Game course. Therefore, the research findings have practical implications for YÖK and MoNE. The training program for elementary school teachers, as well as textbooks and other learning materials, should be carefully reviewed to see how effective PE teaching can be delivered. The entire curriculum should be revised to improve the knowledge, skills, and attitudes of trainee elementary school teachers and to create a classroom environment where they can put this knowledge into practice. In addition, authorized institutions should provide regular pre-and in-service refresher training programs for teachers to enable them to teach PE effectively.

### **Suggestions**

Beyond this study, there are some directions worth pursuing. This study's methodology should be duplicated with larger samples from both rural and urban elementary schools in different parts of Turkey. The findings of this study were obtained using quantitative approaches, and it is advised that the underlying aspects that encourage children's PA participation during PE & Game should be elucidated using qualitative methods that allow for in-depth investigation. In this study, one PE & Game lesson for each teacher was observed. Future research on this topic could incorporate more than one observation of teachers over a longer period to see if their performance in the PE & Game course is transient. Future research should focus on the underlying factors such as school facilities, teacher professional development, and the grade of students, which could be possible causes of low student PA engagement. Future studies should also focus on the development and application of new and innovative instructional approaches to promote and increase student PA engagement during PE & Game course.



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