International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 10, 2020
ISSN: 1475-7192

Study of relation among accelerometer of physical activity and different context factors in primary schools in Iraq

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Abstract

The study aimed to examine the relationship between various context factors in elementary physical education with accelerometer measurements of physical activity. During 2019–2020, there were data collected from 285 students from a private school in Baghdad (1st to 5th grade, 135 males, 135females). In multi-level models, key effects and interactions between the factors were investigated. Statistically significant was a bidirectional interaction between the learning context and the size of class for percent. In comparison with motor skill lessons in larger classes, the biggest differences were between fitness lessons using small classes.

Keywords*: context factors , accelerometer , physical activity , primary schools , Iraq*.

I. Introduction

A physically active lifestyle has many health benefits. Approximately 35 different health disorders, including: arthritis, heart disease ,high blood pressure , stroke ,cancer, metabolic syndrome and type 2 diabetes, may be avoided by being physically active (CDC, 2015). Bones and muscles can be improved, mental wellbeing , and sleep habits with increased physical activity can be enhanced (Mayo Clinic, 2016). In addition , studies have shown the academic performance of a child's fitness levels , also cognitive functioning . Cauderay & Cachat,(2015) assert that in contrast, physical inactivity is associated with increased obese, cardiovascular and high blood pressure prevalence . In addition, Herman et al., (2014) point out that research showed physically active activity helps to prevent obesity while higher sedentary levels can lead to obesity).

The physical activity setting is good for improving PA chances on school days. Many sources suggest that students may gain the skill of having a high-quality physical education program, trust and understanding that they can be active in the school, outside school and over their lives (Sallis et al., 2012).

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Received: 18 Apr 2020 | Revised: 09 May 2020 | Accepted: 02 Jun 2020

Greenfield et al.(2015) assert that the number of MVPA students during physical education can be due to the student, cultural , economic, age, school location and gender .During education , students may be the product of individual students. Change, size of the classroom, professional teachers, lesson form and student the size of class also influence the amount of MVPA achieved (Ruch et al, 2012). Boys and girls involved in comparable amounts of physical exercise, irrespective of the measuring device in an review of 22 articles analyzing physical activity in physical education. Currency et al. The recommendations for physical activity were found to be 1.8 percent for girls and 2.9 percent for boys (Nettlefold et al . 2011). No study has studied, given the findings, the contextual factors associated with physical activity by using accelerometers for a relatively long time. Study objective:

This research aimed at study of relation among accelerometer of physical activity and different context factors in primary schools in Iraq.

II. Methods

Participants

A convenience sample from a private school in Baghdad included 285 school-aged children (1st-5th, 135 males, 135 females). The study was notified to parents in a newsletter and their child(ren) could not take part. In physical education, children were told of the report. Each level has received physical training four days a week. The study design and procedures have been approved by the institutional review committee and the head of the university school.

Instrumentation:

Participants wear a GT1 M (baghdad) actigraph on their hip, in line with their right knee cap. The GT1 M is a vertical and antero-posterior uniaxial accelerometer. The GT1 M is suitable for every age and measures the frequency of body movement at 30 Hz. The length of the epoch (interval of time sampling) was set to 5-s. Epochal length is the frequency of recording of the physical activity of the participant. If longer periods are used, incorrect results can be obtained due to the brief explosions usually experienced by PA children . Therefore, smaller intervals can help to produce reliable results (Rowlands, 2007).

The GT1 M was considered accurate and effective in contrast to oxygen consumption tests . In this age group, this instrument has already been validated (Hanggi et al, 2013). Accelerometers originating from Evenson et al. (2008) who cut down for this study and tested in children using indirect calorimetry . Sedentary: CPM 0–100, light: CPM 101–2295, moderate: CPM 2296–4011 and vigorous: CPM 4012.

Since some students had a specific accelerometer, wear time validation using filters was determined in most cases for six students. With the aid von ID numbers taped into the device surface, each accelerometer was connected to a respective participant. For individual physical education classes, the identification number has been changedFor the identification of data for each student group, the accelerometers are color coded. Data from previously set filters have been downloaded. Filters were set when every person attended the classroom. The students attended physical

education for forty minutes three days a week. The filters started 3 minutes after class and stopped 5 minutes before school end, leading to 45 minutes of physical exercise. This is because this time period demonstrates students more clearly in physical schools .

Study Procedures:

Children had previous experience in physical fitness with a display of physical activity. The children were remembers at the start of the study that the accelerometer was correctly placed (waist above right knee).

Throughout the physical education class the students kept the accelerometer on and sent it back to their shoes before they left. Three days a week, the children earn 45 minutes of physical education and a total of 135 minutes per week. The accelerometer was used for a cumulative duration of 12 weeks and often the accelerometer was used three days a week. Each week the researcher obtained and downloaded the accelerometers. The software that provides this detail is ActiLife 6.11.5 (Pensacola, FL). Filters were mounted in ActiLife. The students received physically training through these filters and the data were collected from the instructor. The researcher recorded data from an Excel file to analyze the results. The researchers reported the age, the size of class (large or small), background (engine skills, fitness) and class level on the excel sheet.

Contextual factors:

When the number of registered students < 30 and if the number of students was 30 or older, the class rates were found to be small. The physical education instructor decides whether a course is based on the core subject / movement motor skill / games versus preparation for a certain lesson. A mixture of two forms of lessons was not a physical education class, though most classes in Iraq are physical education. The relative time spent at each course is highly variable in all forms of lessons and therefore the preference of the researcher is to spread lessons over 12 weeks of observation. The motor skills / games consisted (for example) of the practice of certain game skills and did not require any direct fitness aspect. Fitness training included exercises such as distance, sprint / interval, strength training to improve cardiorespirative capacity or muscle endurance of exercise and a certain component of the exercise exercise. Fitness assessments were also graded as a fitness lesson (e.g., 1-mile walk or progressive aerobic aerobial endurance run). The author was in good contact with the director of physical education at all levels of physical education.

Data analysis:

For outliers using boxplots and z-scores (using a ± 3.0 z-score point), data from the MVPA and phase counting were screened and the Gaussians dispensed using k-density plots were verified. The result is < 5 percent due to z-scores < − 3,0 z, and it was believed that lack of data did not greatly skew the results. The data were analyzed using three multilevel models: one with a continuous outcome and two with discrete results. The principal research consisted of using linear general models with mixed effects for assessment of the wear times during physical training in MVPA (percent MVPA), class measurement (size, width) and context lessons (motor skills / sports, fitness). At childhood and school level, random intercepts were used to collect information in the data structure. Secondary categorical data analyzesThere were developed two binary variables to compare the numbers of students attaining 33

percent MVPA and 50 percent MVPA. Using all contextual variables as predictors, multi-level generalized mixed effect model with a logit connecting function was used to define the probability of a child hitting the respective CMPA cutout. Once, random intercepts were used to aggregate observations into the child- and classroom-level data structure. Rising of the multi-level models examined main effects as well as interactions. The first-grade references, male, motor skills / games, and small classes contained references to all the comparisons. In order to adapt the analyses to multiple dependent values, alpha level was defined at priority p 0,025. SPSS

III. Results:

A total of 175 lessons were given over the five rates during 12 weeks. Some 64% of the courses were for motorsport (112/175) and 54.3% (95/175) were for small sizes. A total of 3593 observations by students were made during the 12-week period. Table 1 presents the descriptive stats of the average percent MVPA and the percentage of children meeting recommendations. Table 2 explains the key effects of the general linear mixed effects model. Women who are engraved in broad sizes in relation to lower percent MVPA rates. In addition, fitness lessons related to higher percentage MVPA in relation to motor skills / games and 3rd and 4th grade students correlated higher percentage MMA in contrast with 1st grade students. When we analyzed for a% MVPA the correlations between the lesson background and the size of classs were statistically important for a% MVPA (β = 14.8%, 95%, 5.7%–23.9%p<0.001). Image. 1 visually shows the relationship between the context of the lecture and the size of the class on a percentage of MVPA. When students get the most MVPA compared to motor ability / sports, and large classes, during exercise lessons with limited the size of classs.

Table 1. Contextual factors compared with the average percentage of moderate to vigorous physical activity and the share of students in physical education who are 33% and 50% moderate and strong (N=281).

	***N* =(3593)**	**MVPA Mean**	**MVPA SD**	**(MVPA)meeting 33%**	**(MVPA) meeting 50%**
Sex					
Males	1798	28.6	10.4	29%	4%
Females	1795	26.8	9.3	24%	2%
The size of class					
Small	1971	30.1	10.3	34%	5%

	N =(3593)	MVPA Mean	MVPA SD	(MVPA)meeting 33%	(MVPA) meeting 50%
Large	1622	25.2	8.9	18%	1%
Grade					
first	867	26.9	9.7	24%	2%
second	724	27.9	9.6	27%	2%
third	747	28.6	10.1	29%	4%
fourth	653	28.9	9.9	27%	3%
fifth	602	27.9	10.7	27%	5%
Context					
The Motor skills	3048	27.1	9.3	25%	1%
Fitness	545	31.8	13.0	36%	13%

MVPA - standard deviation; data obtained from the State of Utah were obtained in the United States in the academic year 2015–2016.

Table (2): Estimates of the main multi-level effect parameter from the overall linear mixed effect models (N = 281).

Predictor	**b-Coefficient (%MVPA)**	**95% Interval Confidence**	***p***
Female	**− 2.0%**	**− 3.3% – -0.7%**	**0.002**
Large Class	**− 4.5%**	**− 5.4%–-3.4%**	**< 0.001**
grade			

Predictor	**b-Coefficient (%MVPA)**	**95% Interval Confidence**	***p***
second	1.1%	− 0.7%–2.9%	0.235
third	**1.3%**	**0.4%–3.1%**	**0.015**
fourth	**2.4%**	**0.6%–4.3%**	**0.011**
fifth	1.1%	− 0.6%–3.3%	0.298
Fitness	**2.4%**	**1.4%–3.3%**	**< 0.001**

The subjects included small the size of classs, kids, first-graders and engine skills; bold statistical meaning; data were collected from Utah in the United States during the academic year 2015–2016.

Table 3 presents the findings of generalized models with mixed effects. For the purposes of the 33 percent MVPA Guideline, it is in a large class with a lower probability of success, and it is registered in 3rd and 4th grades, as opposed to the 1. For 33 per cent MVPA there was no main impact of lesson background. Being female and taking part in a wide class, contributed to lower achievement and exercise lessons connected to higher performance rates than motor skills / games in order to meet MVPA requirement of 50%. No important findings occurred for percent MVPA. There has been a statistically significant association of sex with lessons in interactions with an MVPA of 33% (or OR = 0.52. 95 % CI (036–0.75 p<0.001) .. It showed that exercise girls were less likely to comply with the 33 per cent MVPA guideline. There were no statistically important bidirectional interactions when the interactions were tested with 50 per cent MVPA. No statistically significant tripartite interactions have been found for categorical tests.

Table 3. Estimates of the key effect parameter for the generalized linear mixed effects model at several rates

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Outcome	**Predictor**	**OR**	**95% Confidence Interval**	**p**
Meeting 33% MVPA	Female	0.68	0.46–0.98	0.045
	Large Class	**0.28**	**0.22–0.38**	**< 0.001**

Outcome	**Predictor**	**OR**	**95% Confidence Interval**	**p**
	second grade	0.93	0.58–1.48	0.811
	third grade	**1.76**	**1.12–2.76**	**0.014**
	fourth grade	**1.81**	**1.16–2.82**	**0.011**
	fifth grade	0.91	0.58–1.44	0.808
	Fitness	1.24	0.97–1.57	0.084
Meeting 50% MVPA	Female	**0.51**	**0.31–0.88**	**0.018**
	Large Class	**0.36**	**0.19–0.64**	< **0.001**
	second grade	1.25	0.57–2.71	0.565
	third grade	1.52	0.74–2.18	0.118
	fourth grade	1.47	0.81–2.01	0.054
	fifth grade	1.25	0.55–2.64	0.556
	Fitness	**9.98**	**5.97–16.65**	< **0.001**

Small the size of class, masculine, early degree and driving skills are references; OR is the justification of odds; MVPA stands for moderate to intense physical activity; bold statistical sense is alluded to; data from Utah state have been collected in America over the academic year 2015–2016.

IV. Discussion:

This paper explored the social factors relevant to the number of students involved in primary school physical activity. Student operation has been found to be on average 25% to 31% MVPA in all sectors (see Table 1). These and other findings show that 33 percent MVPA in basic physical exercise can be a practical goal (Scruggs, 2013). On

the basis of contextual considerations, in contrast to larger classes of motor skills and sports, small sizes that used fitsness lessons show a 14.8% improvement in MVPA. This is equivalent to an improvement of approximately 6.75 minutes in a 45-minute course. With the comparatively small spread between students hitting a 33 percent MVPA and a 50% MVPA equal to a 14.85 minute and a 22.5 minute MVPA over 45 minutes, the rise in MVPA by a total of 6.75 minutes is an significant change compared with the motor skills / games lessons with a large size class.

When the class is focused on health and less than 25 students, the share of the students in the MVPA classes can be increased. The quantity of MVPA (adjusted estimate), which is an estimated extra 1 minute of MVPA in a 45 minute class, was increased by 2.4 per cent on days during the participated exercise lessons. At less than 25 students, the MVPA (adjusted estimate) rose 4.5%, which corresponds to around another 2 minute of MVPA for a 45 minute class. While it is difficult to compare the absolute MVPA values between the trials due to differences of lesson time, these relative values increase student practical importance because they do not follow guidelines. These values are very useful in practice.

During physical education, most students in this sample did not follow the required PA guidelines. Many studies have shown that during physical education students do not follow the national MVPA guideline of 50%. It may not be possible to change the the size of class so that only one class of students entered physical school, but not only would result, but they would also receive more MVPA in the schoolroom. Castelli et al, (2007) point out that since more PA students are performing well in study, well test results and a better listening experience, academic time is therefore not taken off (But as the physical teachers are not able to affect this trend, their class management techniques and multiple exercise opportunities are important and motivating their students.

Konukman et al., (2009) assert that when a physical teacher concentrates on providing their students with opportunities to develop their motor skills, exercise may be incorporated into their classes. There may be two exercise stations, for example, combined with the qualifying stations if they do. Or you can combine the sport and fitness stations .Students could throw and take a ball and both partners could take a walk around the gym after four good throws and catches. Students could move and pass, rather than be stopped by a soccer ball. The physical trainer can also arrange a separate training session during the course. The heating up can be all about wellbeing and take longer. Or there might be a fitness component at the end of the lecture.

Many students may not be aware of the advice that 50% of the class time should be MVPA. This may enable students to be aware of PA rates by having a physical activity tool so they can monitor their steps and the MVPA. This may help inspire students to work harder as students are able to track their development during the lesson. Students may be faced with objectives. Such objectives could depend upon how often they achieve 50 percent MVPA, individual objectives, class objectives or even their grade.

The constraints for this analysis include the use of a framework for qualitative and correlation studies, so it is not possible to connect casual interactions with contextual variables and behaviours. Data were also obtained from a private school located in Utah, USA, so empirical data for this analysis is minimal. Three days a week the use of physical training also limits the external validity. We do not know the findings will be widely published in one day a week or five days a week. In addition, the current study only used select contextual variables, so the other contextual

criteria relevant to percent of MVPA are unknown. Such considerations may include the number of plays, whether an indoor or outdoor lesson was performed, the experience of physical instructor, and the use of the pedagogical approach based on the teacher versus the student.

V. Conclusions:

The paper offers a clear explanation of how many physical activities students receive from primary physical education and explains the various contextual factors occur in physical education differently. Data collected over 12 weeks and large surveys (285 participants) help to provide clear proof of internal validity. Smaller sizes (< 30 students) were found to have the greatest physical activity during exercise lessons. These findings will help teachers prepare different lessons.

VI. Recommendations:

The growth of motor skills should not be overlooked because of its connection with involvement in the free-living physical activity and health outcomes. Physical teachers and researchers will endeavor to exhibit higher PA rates during mobile training to optimize health and development benefits for children. Due to the many benefits of engaging children in physical activity, teachers and school administrators can help to develop strategies to promote healthy behaviors during physical education in schools.

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Received: 18 Apr 2020 | Revised: 09 May 2020 | Accepted: 02 Jun 2020

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Received: 18 Apr 2020 | Revised: 09 May 2020 | Accepted: 02 Jun 2020

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Received: 18 Apr 2020 | Revised: 09 May 2020 | Accepted: 02 Jun 2020