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Type of recess and its influence on girls physical activity levels
Influencia del tipo de recreo sobre los niveles de actividad física en chicas

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Abstract. The purpose in this study is to describe the physical activity levels (PA) in primary school female students during four different types of recess: free, with sports equipment, with organized games and with music. Sample consisted of 20 girls (10.6 ± 0.70 mean age) from a Primary Education School in Region of Murcia (Spain). The data collection ocurred during 32 recesses. 8 sessions of each type of recess were observed and analyzed with the iSOPARC app, which structures the activity in three levels: sedentary, walking and vigorous. Results show medium-low levels of PA during breaks, being the free type the ones that reach the highest sedentary level values (39.79 ± 5.38%) while the organized ones obtain the lowest sedentary value (6.89 ± 2.56%). Regarding the vigorous level, the breaks in which music was used are the ones with the highest percentage (51.36 ± 12.55%). After applying the Mann Whitney U statistic, it is shown how the type of recess exerted a significant influence on the results (p = 0.000) in all cases. Conclusions. The recesses in which music is used, activities and games were planned and sports equipment are used achieve higher PA values at a vigorous level and less sedentary lifestyle.
Keywords: physical education, MVPA, physical activity, recess.

Resumen. El propósito de este estudio es describir los niveles de actividad física (AF) en alumnas de educación primaria durante cuatro tipos diferentes de recreo: libre, con equipamiento deportivo, con juegos organizados y con música. La muestra consistió en 20 niñas (10.6 ± 0.70 años) de una escuela de educación primaria en la Región de Murcia (España). La recolección de datos se llevó a cabo durante 32 recreos. Se observaron y analizaron 8 sesiones de cada tipo de recreo utilizando la aplicación iSOPARC, que estructura la actividad en tres niveles: sedentario, andando y vigoroso. Los resultados muestran niveles medio-bajos de AF durante los recreos, siendo los de tipo libre los que alcanzan los valores más altos de nivel sedentario (39.79 ± 5.38%), mientras que los de tipo organizado obtienen el valor sedentario más bajo (6.89 ± 2.56%). En cuanto al nivel vigoroso, los recreos en los que se utilizó música son los que tienen el porcentaje más alto (51.36 ± 12.55%). Después de aplicar la prueba estadística de Mann-Whitney U, se muestra cómo el tipo de recreo ejerció una influencia significativa en los resultados (p = 0.000) en todos los casos. Conclusiones. Los recreos en los que se utiliza música, se planifican actividades y juegos, y se utiliza equipamiento deportivo logran valores más altos de AF a nivel vigoroso y un estilo de vida menos sedentario.
Palabras clave: educación física, MVPA, actividad física, niñas, recreos.

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Introduction

Lack of physical activity, combined with poor diet and sedentary habits, are determining factors in the development of health problems such as obesity, cardiovascular diseases, type 2 diabetes, and various types of cancer in children (Gómez et al., 2019; WHO, 2015; Physical Activity Guidelines Advisory Committee, 2018). Therefore, recent research has been conducted to analyze physical activity levels in schoolchildren with the aim of understanding and promoting interventions within the school environment to encourage longer durations of physical activity.

Physical activity recommendations for children state that they should engage in at least 60 minutes of moderate to vigorous intensity physical activity (MVPA) daily, either continuously or in shorter bouts of 10-15 minutes (Beltrán, et al., 2012; Department of Health and Human Services, 2018; Guthold et al., 2020; WHO, 2010, 2020; Ramos, et al., 2016). Furthermore, these activities should be age-appropriate, varied, and health-oriented. It is also advisable to minimize and avoid prolonged periods of inactivity, aiming to limit sedentary time to less than 2 hours (Frago, 2015).

In this regard, during school hours, Physical Education sessions are the only structured moments when schoolchildren engage in physical activity. However, research indicates that the recommendations for intensity and duration of daily practice are often insufficient (Hellin-Martínez et al., 2019). Moreover, if physical activity levels are already low in the child population, these concerns are further exacerbated in the case of girls, who tend to exhibit more sedentary behaviors and lower levels of daily physical participation (Comte et al., 2013; Frago, 2015; Verloigne et al., 2012).

On the other hand, recess time presents an opportune moment to promote active engagement among schoolchildren, supplementing the time dedicated to Physical Education and offering additional opportunities for diverse activities and games within healthy parameters (Calahorro-Cañada et al., 2015; Domenech, 2017; Fernández et al., 2019; Martínez et al., 2015; Ridgers et al., 2010; Van Kann et al., 2016).

In the same way, schools must take into account Article 31 of the Convention on the Rights of the Child, which emphasizes the importance of providing opportunities for children to enjoy their free time in an educational and enriching manner, significantly contributing to their subjective development and individual growth. In this regard, recess time provides children with an opportunity to explore their identity, develop social and emotional skills, and learn about the world around them (Devita y Díaz, 2021).

However, recess time is often not utilized effectively in schools, as children, especially girls, are not provided with

organized and varied options for active and healthy recreation (Frago, 2015; Mota et al., 2005). Studies on this subject highlight that schoolchildren do not adhere to recommendations during recess, with boys being more active than girls, who tend to exhibit sedentary behaviors or engage in physical activity with low intensity (Nettlefold et al., 2011; Ridgers et al., 2011; Saint-Maurice et al., 2011; Tercedor, Segura-Jiménez et al. 2019).

Studies that describe the participation of schoolchildren during recess time highlight that most girls spend more time socializing, either sitting or standing and talking to each other, walking, playing on a swing, and engaging in other low-intensity activities (Dorovolomo, 2020; Frago, 2015; Coleman et al., 2008; Ridgers et al., 2007; Latorre-Román et al., 2017; Springer et al., 2013). A study conducted with observational instruments during recess highlights those girls spent 8.2% less time in vigorous physical activity and 13.8% more time being sedentary compared to boys (Ridgers et al., 2010). Similarly, other studies highlight MVPA among schoolchildren during recess, with boys being more active than girls (Hellín-Martínez et al., 2022).

Other studies highlight a series of barriers that hinder the participation of low-skilled schoolchildren and girls, who consistently demonstrate significantly lower levels. These barriers include the use of recess spaces for competitive activities, lack of facilities, conflicts among students, and the use of electronic devices (Pastor-Vicedo et al., 2021).

In this regard, the planning of sports games and championships, teaching strategies implemented by Physical Education teachers as motivational elements, various methodologies, equipment, floor paintings, and sports materials, among other elements, generate motivation in both boys and girls to engage in and participate in physical activity (Blaes et al., 2013; Chin & Ludwig, 2013; Dorovolomo, 2020; Massey et al., 2020; Saint-Maurice et al., 2011; Sallis et al., 2001).

The objectives of this study were: a) to describe the levels of physical activity in girls during four different types of recess: free, with materials, with organized games, and with music; b) to analyze which type of recess promotes greater engagement in health-oriented physical activity among girls.

Materials and methods

Participants

The sample for this study consisted of a group of 20 girls aged between nine and 12 years old (mean age 10.6 ± 0.70), selected through convenience sampling. All participants were enrolled in a primary school in the Region of Murcia, Spain.

To conduct this research, the school, parents, or legal guardians of the girls were informed about the study's characteristics, and they provided informed consent by signing a consent form. The study has received approval from the Research Ethics Commission at the University of Murcia.

Instruments

For collecting observational data on physical activity levels, the iSOPARC tool, version 1.85 (CIAFEL, Portugal, https://ciafel.fade.up.pt/) was used through the use of iPad tablets (Apple Inc, USES). Following the protocol developed by Dudley, Cotton, Peralta and Winslade (2018), this tool allows to quantify the level of physical activity carried out by the participants during recess time, structuring the activity in three levels: sedentary, walking and vigorous. The measurement was carried out at two recess moments, 10 minutes after its beginning and 10 minutes before its end, recording the mean between both measurements.

Procedures

The data collection was carried out during 32 school recesses, each lasting 30 minutes. These recesses were structured into four types based on the activities performed, resulting in eight recesses of each type being recorded. The types of recesses were as follows: recesses without intervention, where the students freely participated without any type of intervention; recesses with equipment, where Physical Education materials were provided, specifically (balls, ropes, hoops, frisbees, and cones); recesses with organized games (based on the girls' preferences and interests, the playground was divided into various game areas, with different popular games known to them being located in each area); recesses with music, where selected music chosen by the girls was played through a speaker.

Statistical analysis

Regarding values of levels of physical activity (sedentary, walking and vigorous), tests carried out have been: descriptive analysis of the analyzed data, showing data related to the mean or standard deviation among others, normality tests through of the Shapiro Wilk test for a sample and inferential analysis through parametric Student-T test when distribution was normal and Mann Whitney U otherwise, considering significant the results for Sig. ≤ 0.05.

Effect size of different variables (sedentary, walking and vigorous) on the type of recess was calculated using Cohen's d (Cohen, 1988; Nakagawa and Cuthill, 2007), interpreting the magnitude of the effect as small ($d = 0.20$), moderate ($d = 0.50$) and large ($d = 0.80$). Results were analyzed using the SPSS 25.0 statistical package for Macintosh.

Results

First, table I shows the descriptive results of the girls during analyzed recesses. In this case, the girls reach the following values for each level: sedentary of 21.00 ± 13.40%, walking of 39.69 ± 9.60% and vigorous level of 39.32 ± 16.49%.

Table 1.
Descriptive values: physical activity levels

		Mean	SD	Min	Max
Variable	Sedentary (%)	21.00	13.40	2.78	48.50
	Walking (%)	39.69	9.60	13.66	54.25
	Vigorous (%)	39.32	16.49	11.44	45.26

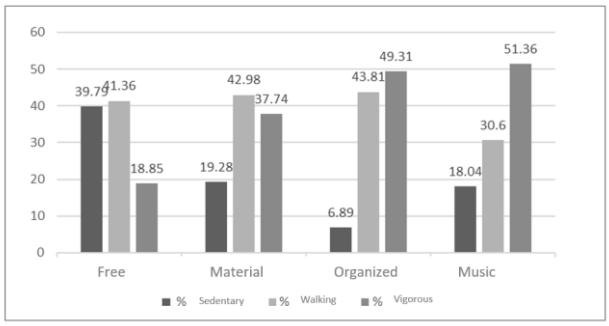

Figure I. Descriptive values for the sedentary, walking and vigorous percentage levels by recess type in girls

Next, Figure I shows the descriptive results of percentages of physical activity for the girls based on the type of recess performed. As can be seen, in free recess, the predominant level of physical activity is walking (41.36 ± 7.99%) and sedentary (39.79 ± 5.38%); in breaks with material, the walking level is the highest, with 49.98 ± 4.19%; In organized breaks, the low level of sedentary stands out with 6.89 ± 2.56% and the highest result is reached by the vigorous level (49.31 ± 4.19%); lastly, during recesses with music, the predominant level is vigorous (51.36 ± 12.55%).

Following section analyzes the influence that each type of recess could have on the results related to activity levels.

After applying the Mann Whitney U test, it is shown how the type of recess exerted a significant influence on the results ($p = 0.000$) in all cases.

Table 2.
Sedentary, Walking and Vigorous values for girls

		SED (%)		WALK (%)		VIGO (%)	
		M±SD	p	M±SD	p	M±SD	p
Recess type	(n=20)	21.00±13.39	0.00*	39.68±9.60	0.011*	39.31±16.49	0.00*

* Significant differences (p≤0.05).

Table 3.
Effect size of the percentage results vigorous for girls.

Vigorous	Free	Material	-18.89250*	-1.61
		Music	-32.51000*	-3.34
		Organized	-30.45750*	-6.39
	Material	Free	18.89250*	1.65
		Music	-13.61750	-0.97
		Organized	-11.56500	-1.03
	Organized	Free	30.45750*	6.35
		Material	11.56500	1.01
		Music	-2.05250	-0.22
	Music	Free	32.51000*	3.41
		Material	13.61750	0.96
		Organized	2.05250	0.22

* Significant differences (p≤0.05).
d Cohen - Magnitude d: small (d=0.20), moderate (d=0.50) or large (d=0.80)

The results found using Cohen's d statistic are presented below, which allows us to know what type of recess had a greater influence on the results. Analyzing this statistic on the level of vigorous activity, it is described how the breaks in which music was present had a positive and greater effect, compared to the rest of the breaks.

Discussion

According with the objectives of this study, the descriptive results on the three levels of physical activity are 21.00±13.40% in sedentary activity, 39.69±9.60% in walking level and 39.32±16.49% in vigorous level. Considering the type of recess developed, in those in which music was used, the girls participated with a higher percentage of vigorous level (51.36 ± 12.55%), followed by recesses with organized games (49.31 ± 4.19%), after recesses with their own Physical Education material (37.74 ± 15.50%) and, lastly, free recesses (18.85 ± 5.30%) were the ones with the lowest percentage of vigorous activity. In this sense, the breaks in which a lower level of sedentary activity was recorded were organized games (6.89 ± 2.56%), followed by music (18.04 ± 7.46%), material (19.28 ± 7.68%) and, finally, the free type (39.79 ± 5.38%) that reached higher sedentary values.

After analyzing the results, it is evident that recess periods offering different stimuli such as music, organized games, and sports equipment led to an increase in vigorous activity and a decrease in sedentary behavior during break time. In this regard, our findings are similar to those of other studies, which concluded that the use of various methodologies, equipment, floor paintings, and sports materials, among other elements, generates motivation among children, encouraging them to engage in physical activity (Blaes et al., 2013; Chin and Ludwig, 2013; Saint-Maurice et al., 2011; Sallis et al., 2001). Consequently, several studies emphasize the importance of implementing strategies such as the use of physical education equipment and materials, as well as the promotion and development of activities that motivate students, particularly girls, to be more active and less sedentary (Massey et al., 2020; McKenzie et al., 2010; Ridgers et al., 2011).

Other studies where levels of physical activity are analyzed based on the observation of schoolchildren highlight the importance of creating playgrounds or activities known to students and where they can freely participate, since these types of breaks generate an increase in the level of vigorous intensity and decrease in sedentary levels and walking (Barnas & Ball, 2019; Dudley, et al., 2018; Ridgers et al., 2010). Similarly, other studies developed with different instruments for measuring physical activity highlight the importance of planning popular and traditional games as a resource for increasing levels of physical activity in healthy parameters with respect to recesses without intervention (Domenech, 2017; Saint-Maurice et al., 2011; Martínez-Martínez et al., 2018; Massey et al., 2020).

In this sense, Massey et al. (2020), affirm that there are social barriers that make it difficult for girls to participate in free recesses, such as, for example, the domination exercised by boys as a majority to occupy space and choose the activity to be carried out (competitive sports games such as

futsal). In addition, in the case of girls, for the activities to be motivating and meet the objective of increasing levels of physical activity, it is necessary that they be structured in terms of time and that various games are offered distributed by zones, following their tastes and preferences (Domenech, 2017; Saint-Maurice et al., 2011; Massey et al., 2020).

Practical limitations

This research presents some practical limitations such as the small size of the sample and that the data were taken only in one school. For all these reasons, it is recommended that the results presented here be taken with caution, since the sample is not representative for all girls in region. In this sense, it would be interesting to develop further research work on this subject, covering a larger sample of girls and belonging to various school contexts.

Practical applications

The results and conclusions presented here can serve as a reference for schools to promote healthy physical activity during recess times, with the aim of increasing PA levels in schoolchildren and especially, in girls, who are show more sedentary. For this reason, it would be interesting to promote the implementation of programs where active recesses are organized and the variables described in the scientific literature are taken into account, such as the use of sports equipment, music, organization of games, floor paintings, among others.

Conclusions

Girls' physical activity levels during recesses without intervention are low, reaching high values of sedentary activities and walking. The recesses in which music is used, activities and games are planned and sports equipment are used achieve higher values of physical activity at a vigorous level and less sedentary lifestyle.

Finally, it is necessary to highlight that, it is necessary to broaden and deepen the study of the variables that relate higher values of healthy physical activity during recess in girls.

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