Received: 28 January 2022 | Revised: 28 March 2022 | Accepted: 18 January 2023

DOI: 10.1111/sms.14320

ORIGINAL ARTICLE

WILEY

Prevalence of meeting all three 24-h movement guidelines and its correlates among preschool-aged children

Robinson Ramírez-Vélez[1,2,3] | **Mikel Izquierdo**[1,2] | **José Francisco López-Gil**[4,5] | **David Rincón-Pabón**[6] | **Edwar Nicolas Martínez-Jamioy**[7] | **Rosemberg Rivera-Ruíz**[7] | **Sebastián Castellanos-Montaña**[7] | **Miguel Alejandro Atencio-Osorio**[8] | **Hugo Alejandro Carrillo-Arango**[8] | **Alicia M. Alonso-Martínez**[1,2] | **Antonio García-Hermoso**[1]

[1]Navarrabiomed, Hospital Universitario de Navarra (HUN)-Universidad Pública de Navarra (UPNA), IdiSNA, Pamplona, Spain

[2]CIBER of Frailty and Healthy Aging (CIBERFES), Institute of Health Carlos III, Madrid, Spain

[3]Facultad de Ciencias de la Educación, Unidad Central del Valle del Cauca (UCEVA), Túlua, Colombia

[4]Health and Social Research Center, Universidad de Castilla-La Mancha, Cuenca, Spain

[5]One Health Research Group, Universidad de Las Américas, Quito, Ecuador

[6]ZIPATEFI (Zona de Investigaciones de Posgrados, Terapia Respiratoria y Fisioterapia de Areandina), Fundación Universitaria del Área Andina, Pereira, Colombia

[7]Grupo de Investigación en Actividad Física y Salud (GIAFS), Institución Universitaria Escuela Nacional del Deporte (IUEND), Santiago de Cali, Colombia

[8]Grupo de Investigación en Deporte de Rendimiento (GRINDER), Programa de Educación Física y Deporte, Universidad del Valle, Santiago de Cali, Colombia

Correspondence
Antonio García-Hermoso, Navarrabiomed, Hospital Universitario de Navarra (CHN), Universidad Pública de Navarra (UPNA), IdiSNA, Pamplona, Spain.
Email: antonio.garciah@unavarra.es

The aim of the present study was twofold: first, to determine the meeting all three 24-h movement guidelines in Colombian preschool-aged children, and second, to explore the associations between different socio-ecological correlates and the meeting of these guidelines. This was a cross-sectional study with data from the *Encuesta Nacional de Situación Nutricional* (ENSIN-2015) in Colombia, 2015–2016. The sample comprised 3002 low-income preschoolers (3–4 years old, 50.7% boys). Data on physical activity, screen time, and sleep time were collected using the *Cuestionario para la Medición de Actividad Física y Comportamiento Sedentario*, reported by their parents. In total, 18 potential correlates (individual, interpersonal, organizational, and community level) were analyzed. Backward binary logistic regression analysis was performed with the potential correlates as independent variables and meeting all three 24-h movement guidelines as dependent variables. The prevalence of preschoolers meeting all three 24-h movement guidelines or none was 4.8% and 16.6%, respectively. In the final model, boys (odds ratio [OR] = 1.87, 95% confidence interval [CI] 1.00–3.50) and those who do not have television in their bedroom (OR = 2.09, 95%CI 1.05–4.14) were more likely to meet all three 24-h movement guidelines compared to with girls

and those who have television, respectively. In conclusion, strategies to promote adherence to all 24-h movement guidelines among low-income preschoolers are warranted, and should focus on actions considering the importance of sex and home environment changes to support these movement behaviors.

KEYWORDS

lifestyle, physical activity, preschoolers, recommendations, sedentary behavior, sleep

1 | INTRODUCTION

Promotion of an active and healthy lifestyle early in life plays an important role in addressing health problems associated with excess weight, insufficient levels of physical activity, and excessive time spent in sedentary behaviors.[1] The health repercussions of time spent in each of the movement behaviors––physical activity, sedentary behavior (including screen time)––traditionally been analyzed in isolation or with only partial adjustment for time spent in other movement behaviors.[2] They are, however, co-dependent, meaning that a change in time spent on one or more behaviors affects the duration of at least one of the other behaviors.[3,4] In this context, in May 2019 the World Health Organization (WHO) integrated and updated the pre-existing guidelines for physical activity, sedentary behavior and sleep in young children based on studies from Canada[5], and Australia.[6] The newly developed guidelines specify that children under 5 years of age should spend at least 180 min daily in a variety physical activities (including ≥60 min/day of moderate to vigorous-intensity physical activity), no more than 1 h in sedentary screen time per day, and at least 10–14 h (depending on age) of good quality sleep.[7]

Meeting all three 24-h movement guidelines generally leads to improvements in several health indicators in both children and adolescents.[8] Thus, increasing the adherence to 24-h movement guidelines could improve preschoolers overall future physical health, lessening the risk of obesity in childhood and the associated non-communicable diseases in adult life, and improving both mental health and wellbeing.[7] Healthy habits of physical activity, sedentary behavior and sleep are developed in early childhood, offering an opportunity to consolidate these habits throughout life.[9] Despite the known benefits, however, studies from Canada,[10] Singapore,[11] Japan,[12] Australia,[13] Belgium,[14] Sweden,[15] Finland,[16] and Portugal[17] have all indicated that only 4.5%–23.6% of preschoolers meet these 24-h movement guidelines. Similarly, Tapia-Serrano et al.[18] found, in a recent metanalysis including 387 437 participants from 23 countries, that only the 8.81% of the preschoolers met all three 24-h movement guidelines. As far as we are aware, only one study from Brazil[19] has collected this information in the preschooler population of a South American country, and there remains a gap in our knowledge about meeting all three 24-h movement guidelines in countries with low-to-medium human development indices.[20] Supporting this notion, this prevalence reported in several studies were mainly from high-income countries,[13,16,21] where social contexts show large disparities from those low- and middle-income countries. Thus, there is a pronounced lack of information in low- and middle-income countries,[8] many of which are in a period of rapid urbanization that may further affect the healthy development of these behaviors among this age group.[22] In this sense, Colombia is considered one of the countries with the greatest socioeconomic inequalities in Latin America.[23] Therefore, from a health equity approach,[24] knowledge of socioeconomically disadvantaged children is essential to health promotion in this population, and, further attention should be paid in the future to research on 24-h movement behaviors in youths from low-income families.

Regarding the correlates associated with 24-h movement guidelines, some sociodemographic, lifestyle, and environmental factors have been previously reported in young people.[8] For instance, Carson and Kuzik showed that sex (girls), ethnicity (minority groups), or socioeconomic status (from families of lower income) were associated with a higher meeting all three 24-h movement guidelines among Canadian preschoolers.[25] Furthermore, De Craemer et al.[26] revealed that having normal weight, parents that do not watch a lot of television, and a father that attained higher education were linked to meeting all three 24-h movement guidelines (on weekdays), as well as, attending a sports club (on weekends). Likewise, Kracht et al.[27] indicated that African American children and children not living at or below the poverty level were less likely to meet all the three 24-h movement guidelines.

The knowledge about 24-h movement behaviors is the first step to informing intervention strategies for the promotion of these healthy behaviors.[26] This fact is especially important for low- and middle-income countries, where there is a low awareness of the relevance of these healthy 24-h movement behaviors in the early years, and benchmarks to establish its prevalence are scarce.[7] To the best of our knowledge, no study has reported on the number of preschoolers meeting all three 24-h movement guidelines and

its potential correlates in a representative sample from a South American country. Accordingly, the aim of the present study was two-fold: (1) to determine meeting all three 24-h movement guidelines, and (2) to examine the associations between different socio-ecological correlates (i.e., correlates at the individual, interpersonal, organizational and community level) and the meeting of these guidelines in Colombian preschool children aged 3–4 years.

2 | MATERIALS AND METHODS

2.1 | Design and participants

This was a cross-sectional study using representative data collected in 2015–2016 by the National Nutritional Situation Survey in Colombia (in Spanish, *Encuesta Nacional de Situación Nutricional* ENSIN-2015). A detailed description of the ENSIN-2015 is available elsewhere.[28] Briefly, the aim of the survey was to describe the food and nutritional situation of the Colombian population within the framework of the model of social determinants, as an input for the formulation, follow-up and reorientation of public policies on food and nutritional security for Colombia. Data were collected by trained nutritionists equipped with computer-assisted personal interview technology, specifically designed for the survey. For preschoolers, a parent or the primary caregiver of the child responded to the interview.

The ENSIN-2015 sample was collected from a national census and comprised 44 202 households, representing 4739 segments located in 295 municipalities in the 32 departments of the country and Bogotá through stratified multistage sampling. Information about the selection of the study sample is shown in Figure 1. A total of 3002 preschoolers aged 3–4 years were included in our study.

Consent for participation in the survey was obtained from the Colombian Institute of Family Welfare (*Instituto Colombiano de Bienestar Familiar*) prior to enrollment. All participating families gave informed consent after receiving information about the survey. The study was conducted in accordance with the Declaration of Helsinki and was approved by the Research Ethics Committee of the *Instituto Nacional de Salud* (CITIN Code number 40-2014, Bogota 6 March 2015).

2.2 | Measurements

2.2.1 | Physical activity, screen time, and sleep

Estimation of physical activity, screen time and sleep were evaluated by the *Cuestionario para la Medición de Actividad Física y Comportamiento Sedentario* (C-MAFYCS), aimed at parents to measure these behaviors outside the educational context. This questionnaire has a moderate internal consistency for physical activity and high reproducibility mainly for walking to school and organized sports.[29] For each these questions, the duration and the day(s) of the week on which they were asked were indicated.

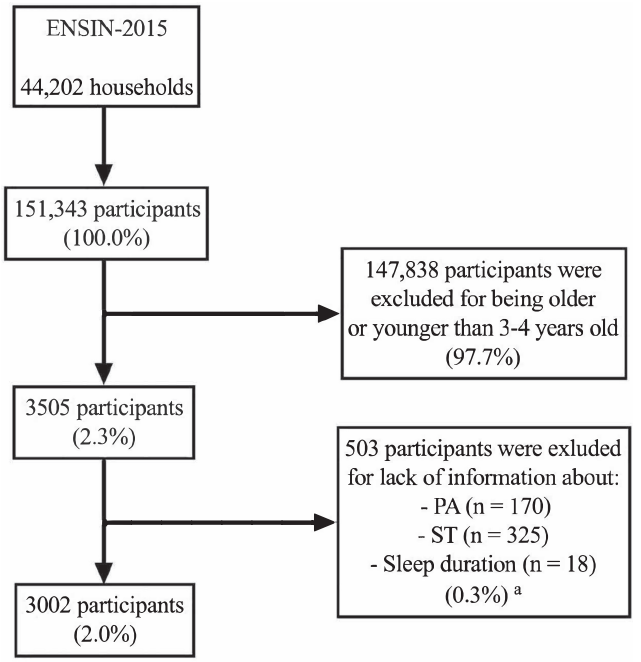

FIGURE 1 Flow chart detailing the selection of the study sample. PA, physical activity; ST, screen time. [a] This decision is justified by the impossibility of determining the meeting all three 24-h movement guidelines when a value of physical activity, screen time, or sleep is missing.

Regarding physical activity, the C-MAFYCS includes variables associated with the time walking to school (e.g., "During the last week, did your child walk to school?"), organized sports (basketball, soccer, etc.) (e.g., "During the last week, did your child practice organized sport activities?"), active play (e.g., "During the last week, did your child play inside/outside the home?"), and playtime activities (walking, dancing, riding a bike, etc.) (e.g., "During the last week, did your child...?").

Sedentary behavior includes questions about motorized transport to school (e.g., "During the last week, did your child use a vehicle to go to school?"), reading (e.g., "During the last week, did your child read?"), "screen time" (e.g., "During the last week, did your child watch television/use a computer/play video games?"), and extracurricular courses (piano, English, etc.) (e.g., "During the last week, did your child attend a course?"). For our purposes, only recreational screen time related questions were considered.

Concerning sleep, the questionnaire includes two questions (e.g., "During the last week, did your child take a nap?"; "During the last week, how long did your child sleep?).

For each these questions, the duration and the day(s) of the week on which they were asked were indicated. The C-MAFYCS has moderate and acceptable reliability for physical activity (Cronbach's α range = 0.59–0.64) and sedentary behavior/sleep (Cronbach's α range = 0.22–0.34) in children under 10 years of age.[29] The Spanish version of the scale has been validated in Colombian children, showing satisfactory reproducibility for walking to school and time spent in this behavior (kappa = 0.79, intra-class correlation [ICC] 0.69), organized sports and time on this activity (kappa = 0.72, ICC 0.76), sedentary behavior such as motorized transport to school and computer use (kappa value of 0.82 and 0.71, respectively). Additionally, the time spent in these behaviors showed an ICC of 0.80 and 0.59, respectively. This questionnaire was completed during one session, and the trained personnel were available to clarify questions as required.

2.2.2 | Meeting all three 24-h movement guidelines

The WHO guidelines on physical activity, screen time and sleep for children under five years old were considered to determine the participants "meeting all three 24-h movement guidelines." The meeting all three 24-h movement guidelines (i.e., physical activity, screen time, and sleep duration) was determined during weekdays and weekends separately. Likewise, participants who met all three guidelines during both weekdays and weekends were considered as "meeting all three 24-h movement guidelines."[7] Average daily physical activity, screen time, and sleep duration were calculated for total minutes spent on each behavior on each day of the week (from Monday to Sunday).

2.3 | Potential correlates

A total of 18 potential correlates were sorted based on the different levels of the socio-ecological model: (1) Individual-level correlates (age, sex, race/ethnicity, weight status, birth weight, and breastfeeding); (2) Interpersonal-level correlates (breadwinner's educational and socioeconomic levels); (3) Organizational-level correlates (type of household, number of people in the household, electronic devices, and television in bedroom); and (4) Community-level correlates (area of residence, green areas, safety places for physical activity, active commuting, attending kindergarten/school, and healthcare system).

2.4 | Statistical analysis

Data are expressed as mean and standard deviation for continuous variables and numbers and frequencies for categorical variables. Differences between categorical variables and continuous variables were examined by the chi-square test and Student's *t* test, respectively. A descriptive analysis was performed to establish the percentage of preschoolers who met each of the different 24-h movement guidelines and binary logistic regression analyses were conducted to explore the association between the socio-ecological correlates with these healthy guidelines. Backward binary logistic regression analyses were performed with the different potential correlates as independent variables and meeting all three 24-h movement guidelines as the dependent variable. Firstly, a binary regression analysis was conducted including all correlates of each category (individual, interpersonal, organizational, and community level). Secondly, the correlate with the highest *p*-value was removed from the model for each step of the backward logistic regression. Likewise, the exclusion of correlates from the model was stopped once all correlates had a $p \leq 0.10$. Thirdly, variables included in the final step ($p \leq 0.05$) were considered as correlates of meeting all three 24-h movement guidelines. We used the survey functions in STATA 16.1 (StataCorp, College Station, TX) to perform all analyses in order to account for the weighting for each observation. A value of $p \leq 0.05$ denoted statistical significance.

3 | RESULTS

The descriptive data of the participants is listed in Table 1. The prevalence of overweight/obesity was 26.5%. In relation to physical activity, a global mean (combined weekdays and weekends) of 74.0 ± 60.1 min was found. For ST hours, a global mean of 1.9 ± 1.6 h was found. Likewise, the global mean for sleep duration was 10.1 ± 1.6 h.

The prevalence of meeting all three 24-h movement guidelines (both individually and in combination) in a global perspective (i.e., from Monday to Friday and on weekends) is shown in Figure 2. The overall prevalence of preschoolers meeting all three 24-h movement guidelines was 4.8%, and 16.6% of the preschoolers did not meet with any of the guidelines. Data stratified by sex can be found in Figure S1. A large majority met the sleep duration guideline, followed by screen time and physical activity guidelines.

Finally, Table 2 describes the socio-ecological correlates maintained in the last step of the binary logistic regression model. Backward logistic regression analysis included 15 steps, in which the correlate that was least statistically

TABLE 1 Socio-ecological correlates of the analyzed sample and according to meeting the 24-h movement guidelines.

Variables	Full sample M (SD) / *n*(%)
Age group, *n* (%)	
3 years	1426 (47.5)
4 years	1576 (52.5)
Sex, *n* (%)	
Boys	1517 (50.5)
Girls	1485 (49.5)
Race/ethnicity, *n* (%)	
Black/Afro-descendant	305 (10.2)
Indigenous	299 (10.0)
Mestizo	2383 (79.8)
Breadwinner's educational level, *n* (%)	
Incomplete elementary or less	801 (26.9)
Complete primary or incomplete high school	1012 (34.0)
Complete high school or incomplete university	1017 (34.2)
Professional degree or higher	148 (5.0)
Socioeconomic status by SISBEN, *n* (%)	
Level I – the poorest	1436 (47.8)
Level II	721 (24.0)
Level III	498 (16.6)
Level IV – the richest	217 (7.2)
Type of household, *n* (%)	
Nuclear family	1593 (53.1)
Extended family	1405 (46.8)
Blended or single-parent family	4 (0.1)
Health care services, *n* (%)	
Contributory or special	969 (32.3)
Subsidized[a]	1925 (64.3)
Non-affiliated	102 (3.4)
Area of residence, *n* (%)	
Urban	2131 (71.1)
Rural	866 (28.9)
Number of people in the household, *n* (%)	
2–4 people	1528 (50.9)
5–6 people	993 (33.1)
≥7 people	481 (16.0)
Active commuting, *n* (yes, %)	1254 (70.8)
Attending kindergarten/school, *n* (yes, %)	1560 (62.3)
Electronic devices, *n* (yes, %)	316 (10.5)
Television in bedroom, *n* (yes, %)	1146 (43.9)
Green areas, *n* (yes, %)	1561 (52.1)
Safety place for physical activity, *n* (yes, %)	1161 (74.4)
Anthropometric measurement, mean (SD)	
Height (cm)	99.5 (6.7)
Weight (kg)	15.95 (2.77)
BMI (z-score)	0.43 (0.02)
Nutritional status by BMI, *n* (%)	
Normal weight	2134 (73.5)
Overweight/obesity[b]	769 (26.5)
Breastfeeding, *n* (yes, %)	1337 (70.7)
Birthweight in g, *n* (%)	3230.0 (508.1)
Birthweight status, *n* (%)	
Underweight	71 (7.0)
Normal weight	881 (87.1)
Macrosomic	59 (5.8)
24-h movement behaviors	
From Monday to Friday, mean (SD)	
Daily physical activity (min)	85.9 (73.3)
Daily screen time (h)	1.7 (1.6)
Daily sleep (h)	10.1 (1.7)
On weekends, mean (SD)	
Daily physical activity (min)	40.5 (36.8)
Daily screen time (h)	2.1 (1.8)
Daily sleep (h)	10.2 (1.7)
Global, mean (SD)	
Daily physical activity (min)	74.0 (60.1)
Daily screen time (h)	1.9 (1.6)
Daily sleep (h)	10.1 (1.6)

Abbreviations: BMI, body mass index; SISBEN, *Sistema de Selección de Beneficiarios Para Programas Sociales*.

[a]This system is maintained with the contributions of the contributors and only those who have socioeconomic status 1 and 2 (according to *Sistema de Identificación de Potenciales Beneficiarios de Programas Sociales*) can enter it.

[b]Prevalence of excess of weight according to the World Health Organization criteria.[48]

significant was removed from the model in each step. The number of participants included in this last step was 2323. Results showed that boys (odds ratio [OR] = 1.87, 95% confidence interval [CI] 1.00–3.50) and those who did not have television in their bedroom (OR = 2.09, 95%CI 1.05–4.14) were more likely to meet all three 24-h movement guidelines when compared with girls and with those who had television, respectively.

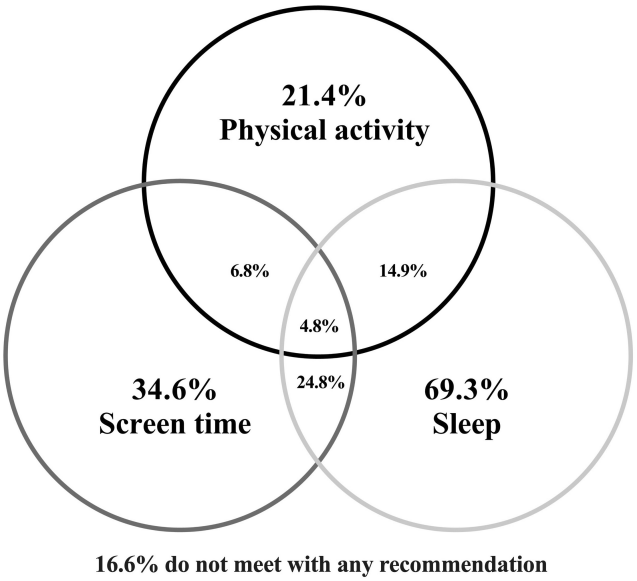

FIGURE 2 Venn diagram showing the prevalence of meeting all three 24-h movement guidelines for children under five years old.

4 | DISCUSSION

Overall, our data showed that approximately one in five children did not meet with any of the guidelines. The adherence to physical activity guideline was only 21.4%, which, along with screen time (34.6%), were the major reasons for the low proportion of preschoolers meeting all three 24-h movement guidelines. Our final model showed that boys and those who do not have TV in their bedroom were more likely to meet all three guidelines compared with girls and with those who have TV. Therefore, our findings highlight essential individual and organizational disparities in meeting optimal physical activity, screen time and sleep among Colombian preschoolers.

A low prevalence of meeting all three 24-h movement guidelines has been reported in several studies movement guidelines has higher prevalence with similar age groups, but these were mainly from high-income countries such as Canada and Australia,[10,13,16] where social contexts are very different from those of the present sample. These discrepancies can be explained in part by the differences between social contexts (e.g., inequalities), since they may influence the 24-h movement behaviors.[30] Inequalities in accessing opportunities to engage in PA occur in most low-middle-income countries and might be an important factor to combat the global insufficient physical activity levels.[31] Supporting this, Colombia has been identified as one of the countries with the highest socioeconomic inequalities among Latin American countries.[23] In addition, Latin American and Caribbean countries have shown some of the highest levels of insufficient physical activity,[32] and, more specifically, Colombia has been pointed out as the least physically active country in the world.[33] Another possible explanation for the observed differences might be related to methodological

TABLE 2 Final results of the multilevel logistic regression analysis with potential socio-ecological correlates as independent variables and meeting the 24-h movement guidelines as a dependent variable, among Colombian preschoolers.

Predictors	OR	95% CI	*p*
Individual-level			
Age group	Variable excluded in step 9[a]		
Sex			
Boys	1.87	1.00–3.50	0.050
Girls	1		
Race/ethnicity	Variable excluded in step 6[a]		
Nutritional status by BMI[c]	Variable excluded in step 1[a]		
Birthweight status	Variable excluded in step 13[a]		
Breastfeeding	Variable excluded in step 8[a]		
Interpersonal-level			
Breadwinner's educational level	Variable excluded in step 11[a]		
Socioeconomic status by SISBEN[b]	Variable excluded in step 15[a]		
Organizational-level			
Type of household	Variable excluded in step 10[a]		
Number of people in the household	Variable excluded in step 16[a]		
Electronic devices	Variable excluded in step 7[a]		
Television in bedroom			
Yes	1		
No	2.09	1.05–4.14	0.036
Community-level			
Area of residence	Variable excluded in step 14[a]		
Green areas	Variable excluded in step 4[a]		
Safety place for physical activity	Variable excluded in step 12[a]		
Active commuting	Variable excluded in step 5[a]		
Attending kindergarten/school	Variable excluded in step 2[a]		
Health care services	Variable excluded in step 3[a]		
Model performance: $R^2 = 0.06$; $\chi^2 = 57.44$; $p < 0.001$			

Abbreviations: BMI, body mass index; CI, confidence interval; OR, odds ratio; SISBEN, *Sistema de Selección de Beneficiarios Para Programas Sociales*.

[a]Logistic regression models with backward stepwise variable selection method (statistical criterion $p \leq 0.10$).

[b]This system is maintained with the contributions of the contributors and only those who have socioeconomic status 1 and 2 (according to *Sistema de Identificación de Potenciales Beneficiarios de Programas Sociales*) can enter it.

[c]Prevalence of excess of weight according to the World Health Organization criteria.[48]

issues. Thus, the above-mentioned studies reporting data on physical activity and sleep duration used different methods to collect the information (i.e., different self-reported questionnaire, device-measured, etc.), which may to some extent justify the mismatch. Also, most of the studies used small-sized and non-representative samples, which could also partially explain the disparity in the results.

In relation to individual-level correlates, we observed a stronger association of meeting all three 24-h movement guidelines in boys than in girls, corroborating the findings of other studies.[16,17] These findings might be because meeting physical activity guideline is generally lower in girls,[34] which is supported in our sample (data not shown). Likewise, a study in low-income preschoolers from Brazil, whose cultural contexts are more similar to ours, reported that boys engage more in moderate-to-vigorous-intensity physical activity than girls.[19] Therefore, our findings seem to indicate the need to create policies and programs with a differential approach that provide opportunities for girls to be active from early years. By contrast, no significant associations were observed regarding weight status and 24-h movement behaviors, which is in line with some systematic reviews in preschoolers.[4,21,35,36] These studies showed that the relationship between adiposity and 24-h movement guidelines was mostly weak or null. This finding is probably not surprising in apparently healthy preschoolers, as the detrimental consequences of low level physical activity, insufficient sleep, greater sedentary time and screen time activities on obesity are much more likely to appear when children get older.[37,38]

Regarding interpersonal-level correlates, we found no association between preschoolers' household income (wealth index), or breadwinner's educational level and 24-h movement guidelines. In this aspect, the existing literature offers inconclusive evidence with mixed results for both preschoolers' household income[8,27,39] or breadwinner's educational level.[26,40] The differences in the methodology used to determine the 24-h movement guidelines, or the higher prevalence of families in the lowest groups of wealth index could (partly) influence on the results obtained.

Among organizational-level correlates, we found that not having a TV in the preschooler's bedroom was associated with meeting all three 24-h movement guidelines. The presence of electronic devices in children' and youths' bedrooms is a predictor of screen time,[41] whereas having device-free bedrooms (and established sleep routines) has been found to be important for preschoolers in reducing overall screen time and having an adequate sleep duration.[41] For these reasons, the *American Academy of Pediatrics Council on Communications and Media* calls for removing electronic devices from bedrooms before bedtime.[42] One might speculate that less sleep time and longer awake time may also provide children with greater screen exposure,[43] which seem to be common in Latin American families.[44] As parents have a central role in establishing the home environment, by determining the number of televisions, rules for television viewing and also their children's bedtime routine,[45] interventions to reduce screen time would help parents in making home environmental changes, especially when the children are young. Supporting this idea, children from countries with a high population density (e.g., Colombia), might suffer a decrease in sleep duration, and sleep quality, because they often share beds and bedrooms and are more exposed to electronic media in these spaces.[46]

In relation to community-level correlates, a recent systematic review has highlighted that the environment may influence adherence to 24-h movement guidelines.[8] For example, Manyanga et al.[20] found a higher proportion of Mozambican children meeting all three 24-h movement guidelines from rural areas. We found no such relationship, possibly because of differences in the geographic locations and age of children. Furthermore, Klingberg et al.[47] showed that the lack of safe places to play was related with a lower meeting all three 24-h movement guidelines among South African preschoolers. This discrepancy with our results may be that, in some areas of Colombia, the neighborhood environment is not attractive or safe for outdoor activities, which predisposes to sedentary activities at home and may contribute to increased screen time.

The main limitation of this study is the reliability of parent-reported information. Nevertheless, in the absence of an objective measure of physical activity, screen time, and sleep, self-reporting is one of the most feasible ways to evaluate these behaviors. Also, the fact that the questionnaires were completed anonymously reduces the likelihood of incorrect information. Another limitation of this study is its cross-sectional design, which does not allow the determination of causal inferences. Future longitudinal and intervention studies will be needed to determine the best separation of daily movement behaviors for good health status during early childhood.[4] Strengths of the study include the large representative sample of preschool children from a low-middle-income country (Colombia) and the fact that, to our knowledge, this is first study to determine the prevalence of Colombian preschoolers meeting all three 24-h movement guidelines. Also, we analyzed the combination of all three 24-h movement guidelines jointly rather than in isolation, as it has been underscored that independent associations between sedentary behavior and health could be compromised by inadequate adjustments for sleep duration and physical activity.[2,8]

Moreover, we used a socio-ecological model to analyze the possible factors that could affect the meeting all three 24-h movement guidelines. This choice was based on the better understanding of how some factors can affect meeting all three 24-h movement guidelines.

In conclusion, a low prevalence of Colombian preschoolers meeting all three 24-h movement guidelines was observed. Being a boy and not having a TV in the bedroom were considered as correlates of meeting of these guidelines.

5 | PERSPECTIVE

Our findings suggest that there are essential individual and organizational disparities in meeting all three 24-h movement guidelines, which could influence preschoolers' health. Strategies and programs to promote adherence to all 24-h movement guidelines among low-income preschoolers are warranted, and should be focused on actions considering the importance of sex and home environment changes to support these movement behaviors.

AUTHOR CONTRIBUTIONS

Robinson Ramírez-Vélez and David Rincón-Pabón designed the study, obtained the databases of the ICBF (Instituto Colombiano de Bienestar Familiar; Colombian Family Welfare Institute), prepared the databases and conducted and led statistical analyses. José Francisco López-Gil, Mikel Izquierdo, Edwar Nicolas Martínez-Jamioy, Rosemberg Rivera-Ruíz, Sebastián Castellanos-Montaña, Miguel Alejandro Atencio-Osorio, Hugo Alejandro Carrillo-Arango, and Antonio García-Hermoso conducted statistical analyses, interpreted the results, prepared, reviewed, and wrote the manuscript that was finally submitted. All authors reviewed the manuscript and approved the final version.

ACKNOWLEDGEMENTS

JFL-G is a Margarita Salas Fellow (ID 2021-MS-20563) of the Universidad de Castilla-La Mancha. AG-H is a Miguel Servet Fellow (Instituto de Salud Carlos III-FSE – CP18/0150). Open access funding provided by Universidad Pública de Navarra.

DATA AVAILABILITY STATEMENT

The databases that allowed this analysis are available for public access and can be obtained by requesting them from the Ministry of Public Health of Colombia. The data generated and analyzed for the current study are available at reasonable request to the corresponding author.

ORCID

Robinson Ramírez-Vélez https://orcid.org/0000-0003-3075-6960
Mikel Izquierdo https://orcid.org/0000-0002-1506-4272
José Francisco López-Gil https://orcid.org/0000-0002-7412-7624
Miguel Alejandro Atencio-Osorio https://orcid.org/0000-0002-0965-2182
Hugo Alejandro Carrillo-Arango https://orcid.org/0000-0001-6832-5379
Alicia M. Alonso-Martínez https://orcid.org/0000-0002-7204-696X
Antonio García-Hermoso https://orcid.org/0000-0002-1397-7182

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Ramírez-Vélez R, Izquierdo M, López-Gil JF, et al. Prevalence of meeting all three 24-h movement guidelines and its correlates among preschool-aged children. *Scand J Med Sci Sports*. 2023;00:1-10. doi:10.1111/sms.14320