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ORIGINAL ARTICLE

# The postural control of Brazilian children aged 6 to 9 years using a smartphone is similar to their posture with eyes closed

**Thiago Weyk de Oliveira Beliche[a], Tânia Cristina Dias da Silva Hamu[b], Thailyne Bizinotto[c], Celmo Celeno Porto[c], Cibelle Kayenne Martins Roberto Formiga[a,b]**



[a]Graduate Program in Sciences Applied to Health Products, State University of Goiás (UEG), Anápolis, Goiás, Brazil

[b]Physiotherapy undergraduate program, Musculoskeletal Research Laboratory, State University of Goiás, Goiânia, Goiás, Brazil

[c]Graduate Program in Health Sciences, Federal University of Goiás (UFG), Goiânia, Goiás, Brazil.

**Corresponding author**
thiagofisio30@gmail.com

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## Abstract

**Introduction:** Electronic devices have been used by increasingly younger people, leading researchers to investigate the impact of these technologies on the health of developing children.

**Objective:** To investigate the impact of smartphone use on the postural control of Brazilian children 6 to 9 years old.

**Methods:** This cross-sectional study was conducted with 278 children from public schools in Goiânia (Goiás, Brazil). The children were assessed in an orthostatic posture with the computerized baropodometry system in three conditions: eyes open, eyes closed, and using a free smartphone application.

**Results:** The children were 8.36 years old on average, 82% of them were well-nourished, and had a daily mean screen time of 2 hours. The postural control analyses revealed that the children made greater postural adjustments with their eyes closed than with them open. When using the smartphone application, the postural adjustments were similar to those with eyes closed. In the stabilometry, the postural displacements made by the children behaved similarly to the static assessment only in total feet surface area.

**Conclusion:** Smartphone use and absence of visual stimulus in the orthostatic position caused postural instability in children 6 to 9 years old. These findings can contribute to understanding the impact of technologies on children's development of balance in daily tasks.

**Keywords:** child development, balance, postural control, screen time.

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**Authors summary**

**Why was this study done?**
This is pioneer research in Brazil, presenting a novelty on the impact of mobile technology on children's motor development. The theme of the research is up-to-date and is in line with international discussions involving professionals and researchers that investigate the growth and development of children born in the digital era.

**What did the researchers do and find?**
In our study (cross-sectional study), we investigated the effect of smartphone use on the postural control of Brazilian children 6 to 9 years old. The postural control analyses revealed that the children made greater postural adjustments with their eyes closed than open. Also, when using the smartphone application, the postural adjustment was similar to that with the eyes closed. In the stabilometry, the postural displacements performed by the children behaved similarly to the static assessment only in total feet surface area.

**What do these findings mean?**
Considering the age when postural control develops, our findings indicate that schoolchildren aged 6 to 9 years face many unstable activities in their daily tasks, particularly regarding the use of mobile devices for hours, as they can decrease postural stability. Also, based on the results, it was verified that smartphone use in an orthostatic position associated with an attentional demand destabilized the children's postural control, as when they had their eyes closed, in contrast with having their eyes open. Hence, the children had greater postural instability in the activity performed with the smartphone.

## INTRODUCTION

Technological advancements are among the most striking phenomena of present-day society. They have triggered the expansion of the mobile phone network, and thus smartphones have become widely used by adults, adolescents, and children[1]. Children have been starting to use this device increasingly earlier, either because the technology is fascinating, or for the social status it represents[2].

Children and adolescents are more and more immersed in and connected to the virtual world of information and communication technology. The use of mobile devices such as smartphones and tablets with access to social media has impacted their family and school relationships. Data from research conducted by the Internet Management Committee in Brazil reveal that Internet access via these devices has had a significant increase. It is estimated that 86% of children and adolescents aged 9 to 17 years access the Internet via smartphones, and the results show that this proportion has been increasing over the years[3]. In Brazil, the indicators and statistics point out that 34% of young people and adolescents have learned skills with their online activity that they had not learned at school[4].

Postural control is an important parameter to maintain posture and carry out functional activities from childhood to adulthood. Hence, assessing it in early childhood is greatly important as it is an essential indicator of the child's proper motor development. Postural control is also associated with the maturation of the central nervous system and requires the integration of visual, vestibular, and proprioceptive information. Moreover, it demands postural strategies to maintain body balance, including the use of strength to control the position of the body and cognitive skills such as attention and motivation[5] which can positively or negatively influence the development due to the early use of technology[6].

During childhood, which is an important period to the child's development, the performance in static and dynamic balance is an essential element in postural control assessment. In this phase, the children's balance control is less developed than the adults since the postural stability is gradually refined as they grow up in a typical development[7].

Various factors contribute to attentional performance at school when children carry out cognitive and motor tasks. The influence of daily dual tasks performed by the children when using the smartphone may be a risk factor for both poor posture and balance instability when carrying out daily skills, especially in standing posture[8]. Thus, it is important to assess these aspects when preventing health problems in children.

The American Academy of Pediatrics points out the multifactorial effects of using media and emphasizes the strong association between media content and children's behavior[9]. In Brazil, the Brazilian Society of Pediatrics recommends limiting the maximum daily screen time to 2 hours for children 6 to 10 years old and 3 hours for adolescents 11 to 18 years old[10].

Although electronic devices are present in the daily life of Brazilian children, the effects of their use on aspects of the young children's motor development (such as balance and postural control) have not been fully clarified yet. Hence, the objective of this study was to investigate the impact of smartphone use on the static postural control of children 6 to 9 years old.

## METHODS

This cross-sectional study was conducted in three full-time public schools in Goiânia, Goiás, Brazil. The sample size was calculated with GPower 3.1.2 software, considering the 4% minimum effect size, 95% test power, and 5% significance index. The sample number resulted in 272 participating children.

A total of 700 invitations were handed out to participate in the research, of which 278 children authorized by their parents agreed to participate. The sample comprised typical children of both sexes, recruited according to the age range of 6 to 9 years. Children with congenital anomalies, a history of surgery, fracture, upper or lower limb luxation, delayed cognitive development, convulsive crisis, sensory changes, and stereotypies were excluded. The study complied with the principles of research ethics and was approved by the Human Research Ethics Committee of the Federal University of Goiás with protocol number 71269717.0.0000.5083.

**Instruments and procedures**

The following instruments and material were used: physical, anthropometric, and health data sheet (weight, height, body mass index, foot dominance, information on electronic device use, and sleep time), socioeconomic questionnaire (assessing family income and social class, stratified from high [B1-B2] to low [D-E] purchasing power), digital scale (G-Tech®, model Glass 10 with tempered glass, 100 kg subdivisions and a maximum load of 150 kg), a portable stadiometer, and a baropodometry platform (measuring 565 x 420 x 25 mm, active surface of 490 x 490 mm, with 4096/6x6 capacitive sensors, 200 Hz frequency, and 120 N/cm² maximum pressure per sensor, using Footwork Pro® software). The baropodometry equipment was automatically calibrated before beginning the data recording and collection; a notebook was used for the data transmitted from the platform. A duly trained professional physiotherapist assessed the children in a separate room in each school. The questionnaires on the children's information were administered to the parents/ guardians.

At first, the participants got acquainted with the test protocol. To verify foot dominance, the children were instructed to kick a ball with the dominating foot. To assess postural control, the children were asked to stand barefoot on the platform in a static orthostatic position, with parallel feet apart. They were previously shown how to step up onto the platform. Based on the instructions given, the position width was automatically selected by the child as they went up onto the platform, simultaneously viewing both feet (right and left) to quantify the data. The postural control analyses were registered in three conditions: a) Eyes open (EO), in which the child kept the upper limbs along the body and looked to a fixed point on the wall 1.5 meters away; b) Eyes closed (EC), in which the child stood as in the previous condition but with their eyes closed; c) Dual tasks (DT), in which the child stood in orthostatic position, flexing the cervical spine and using the arms simultaneously while holding the device (an iPhone 8 smartphone, iOS 13.3, 148 g, from Apple Inc.), paying attention to the screen, and using the Plush Hospital free mobile application.

A single recording was made in each testing condition. The analyses were made following a protocol with a 30-second cut as a reference for each testing condition[11].

**Figure 1:** Assessment of postural control with the child on the platform in the dual-task condition.

The statistical data analysis was conducted with the Statistical Package for the Social Sciences – SPSS version 23.0. Data normality was tested with the Kolmogorov-Smirnov statistical test. The descriptive analysis was conducted with mean and standard deviation for the scalar or numerical variables and frequency and percentage for the categorical variables. In all the analyses, the p-value was considered with a 5% significance index ($p \leq 0.05$).

The repeated measures ANOVA test was used for the variables with a normal distribution (foot mean pressures) to compare the children's postural control in the three assessment conditions, observing the sphericity with the Greenhouse-Geisser ($p < 0.001$) and Sidak post hoc test. The Friedman test with Wilcoxon post hoc was used for the variables without normal distribution (areas, weight support, and anteroposterior and side-to-side displacements).

## RESULTS

A total of 278 children, mean age 8 years, participated in the study. The sample characterization is shown in Table 1. Most of the children in this study are males, well-nourished, with a prevalence of right foot dominance. On the socioeconomic aspect, the children belonged mostly to low-income families. As for screen time, 56.3% of the children watched television for 2 to 7 hours a day. The summed time of mobile device use (tablet, computer, and smartphone) was approximately 2 hours a day; 44.6% of the children had access to the Internet. The mean sleep time was 8.2 hours a night.

**Table 1:** Characterization of the study sample (n = 278)

| Variables | Mean | SD |
|---|---|---|
| Age (years) | 8.36 | 1.14 |
| Child's body mass (kg) | 31.17 | 8.83 |
| Child's height (metros) | 1.33 | 0.09 |
| Body mass index (kg/m²) | 17.30 | 3.34 |
| Family income (in Brazilian reais) | 2.715.33 | 2.853.30 |
| | Frequency (f) | Percentage (%) |
| Sex | | |
| Females | 133 | 48 |
| Males | 145 | 52 |
| Classification of the body mass index* | | |
| Underweight (1st - 3rd) | 7 | 2.5 |
| Well-nourished (5th - 75th) | 227 | 81.7 |
| Obesity (95th - 99th) | 44 | 15.8 |
| Foot dominance | | |
| Right | 255 | 91.7 |
| Left | 23 | 8.3 |
| Socioeconomic class** | | |
| B1-B2 | 9 | 3.3 |
| C1 | 25 | 9.0 |
| C2 | 65 | 23.4 |
| D-E | 66 | 23.7 |
| Internet use** | | |
| Yes | 124 | 44.6 |
| No | 41 | 14.7 |

*Percentage-based classification. **Not all the parents/guardians answered this question, so it was not possible to collect their data in the interview. Source: the author.

Table 2 presents the results of the time of use of electronic media. As for screen time, 56.3% of the children spent 2 to 7 hours a day watching television. The time using electronic media (tablet, computer, and smartphone) added up to approximately 2 hours a day; also, 44.6% of them had access to the Internet. The mean sleep time was 8.2 hours a night.

**Table 2:** Result of the time using electronic media

| Electronic media used | Mean | SD |
|---|---|---|
| TV time (hours/day) | 1.88 | 1.31 |
| Tablet time (hours/day) | 0.47 | 0.97 |
| Smartphone time (hours/day) | 1.38 | 1.29 |
| Computer time (hours/day) | 0.26 | 0.56 |
| Hours with mobile devices (total time) | 1.80 | 1.50 |
| Sleep time (per night) | 8.26 | 1.04 |
| Internet use** | Frequency (n) | Percentage (%) |
| Yes | 124 | 44.6 |
| No | 41 | 14.7 |

** Not all the parents/guardians answered this question in the interviews. Source: author.

Table 3 shows the results of the statistical analysis of postural control. It is noticeable that, in the eyes-closed condition, the values regarding forefoot pressure, area, and forefoot surface of both feet increased in relation to eyes open and were similar to the dual-task condition (smartphone use paying attention to the smartphone screen).

The results of the stabilometry analysis of postural control are presented in table 4. The use of smartphones decreased the anteroposterior displacement in relation to the eyes-closed condition. The children assessed had less anteroposterior displacement (AP) in the EO and DT conditions, whereas there was a greater displacement in the EC condition. Using the smartphone, the side-to-side displacement (SS) was greater than in the EO and EC conditions. The ellipse area values, in their turn, were similar in the EC and DT conditions.

**Table 3:** Results of postural control of the children in the statistical analysis.

| | | EO | | EC | | DT | | p | EO x EC | EO x DT | EC x DT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Variables** | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | | | |
| Left foot | Forefoot MP (%) | 17.15 | 5.42 | 18.15 | 5.53 | 18.25 | 6.10 | <0.001 | 0.001 | 0.002 | 0.979 |
| | Hindfoot MP (%) | 32.09 | 7.92 | 30.89 | 7.78 | 31.93 | 9.40 | 0.016 | <0.001 | 0.98 | 0.083 |
| | MP (kPa) | 34.24 | 9.77 | 32.72 | 8.85 | 33.35 | 10.14 | <0.001 | <0.001 | 0.15 | 0.31 |
| | Area (cm²) | 58.75 | 15.95 | 60.75 | 15.47 | 61.72 | 16.03 | <0.001 | <0.001 | <0.001 | 0.013 |
| Right foot | Forefoot MP (%) | 20.71 | 6.49 | 21.87 | 6.63 | 21.19 | 6.83 | <0.001 | <0.001 | 0.42 | 0.10 |
| | Hindfoot MP (%) | 29.82 | 7.33 | 29.07 | 6.99 | 28.66 | 8.48 | 0.02 | 0.05 | 0.04 | 0.72 |
| | MP (kPa) | 34.72 | 9.66 | 33.50 | 8.81 | 33.14 | 10.17 | 0.003 | 0.004 | 0.008 | 0.83 |
| | Area (cm²) | 59.71 | 15.35 | 61.41 | 15.78 | 62.33 | 16.24 | <0.001 | <0.001 | <0.001 | 0.225 |
| R and L | Forefoot WS (%) | 37.93 | 10.07 | 40.14 | 10.25 | 39.39 | 10.32 | <0.001 | <0.001 | <0.001 | 0.163 |
| | Hindfoot WS (%) | 62.09 | 10.09 | 59.85 | 10.24 | 60.38 | 10.85 | <0.001 | <0.001 | <0.001 | 0.197 |

Legend: EO: eyes open; EC: eyes closed; DT: dual tasks; SD: standard deviation; L: left; R: right; MP: mean pressure; P: post hoc; WS: weight support; % (percentage of load distribution). Source: the author.

**Table 4:** Results of postural control of the children in the stabilometry.

| **Variables** | **EO** | | **EC** | | **DT** | | **p** | **Post hoc (p-value)** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** | | **EO x EC** | **EO x DT** | **EC x DT** |
| Anteroposterior displacement (cm) | 1.71 | 0.80 | 2.09 | 0.96 | 1.83 | 0.80 | <0.001 | <0.001 | 0.063 | <0.001 |
| Side-to-side displacement (cm) | 1.48 | 1.04 | 1.67 | 0.90 | 2.03 | 1.76 | <0.001 | 0.06 | <0.001 | 0.002 |
| Ellipse area (cm²) | 2.23 | 2.26 | 3.01 | 2.61 | 3.46 | 5.54 | <0.001 | <0.001 | <0.001 | 0.444 |

Legend: EO: eyes open; EC: eyes closed; DT: dual tasks; SD: standard deviation. Source: the author.

## DISCUSSION

The objective of the study was to assess the impact of smartphone use on the postural control of children 6 to 9 years old. The results revealed that the participating sample had homogeneous characteristics regarding sex, health conditions, and their family's socioeconomic aspects. All children in the research had had previous contact with electronic devices, such as tablets and smartphones, and most of them had frequent access to the Internet. All children studied in full-time schools, and despite spending a long time at school, the daily mean screen time was approximately 2 hours; they also had a satisfactory sleep time. No difference was found in the screen time between the different ages assessed.

In this study, the sum of the time using mobile devices (smartphone, tablet, and computer) was approximately 2 hours a day. Also, 44.6% of the children assessed had access to the Internet. This value agrees with the recommendation of the Brazilian Society of Pediatrics[10] and a systematic review on the theme[12]. However, a study conducted in Turkey with preschoolers verified that the total screen time, including mobile devices, was 3 hours a day one hour more than in the present study. This is explained by the fact those children belonged to high socioeconomic and educational settings, with easy access to technology[13].

The analyses of postural control of the children assessed in the eyes-open, eyes-closed, and smartphone-use conditions revealed that the postural adjustments performed by the children were similar for most parameters in the eyes-closed and smartphone-use conditions, unlike when the children were in orthostatic position with their eyes open.

The influence of each of the sensory systems is greatly important to the integration and maintenance of postural control. Thus, the vision had a fundamental role in postural control. The vestibular system is sensitive to the information of head position in space and sudden changes in the direction of movement. Stimuli from the visual, somatosensory, and vestibular systems are important information components about head positioning and body movement. Each of these senses furnishes different information to the central nervous system, with a different model to postural control[14].

It is believed that the adaptations made by the children in this study with eyes closed further activated the vestibular sensors to control the movement and maintain posture. This is due to their sensitivity to information on head positioning in space and sudden changes in the direction of movement. The peripheral stimuli coming from the somatosensory, vestibular, and visual systems provide different references regarding the positioning and movement of the body, in relation to the environment and gravity. During the maintenance of static orthostatic posture, the body sway doubles when the visual information is absent[15]. In this sense, when the child started using the smartphone paying attention to the cognitive task, the somatosensory system may have been further activated to maintain the position of the feet on the platform and minimize the trunk and head movements.

In this study, the body displacement of children using the smartphone was similar to that in the eyes open condition. On the other hand, the displacement increased when the child closed their eyes. The additional weight of the device did not influence the results of the variables of the present experimental condition. Vision is known to be an important component of postural control, and postural stability tends to be better when seeing with both eyes[16]. In this regard, the children are believed to have adjusted their balance with peripheral vision even while involved in a cognitive task.

In another study, preschoolers aged 3 to 5 years were assessed to investigate how age and sensory deprivation affect the temporal organization, the center of pressure (CoP) sway variability, and posture correction commands. The results revealed that the 5-year-old children had less CoP sway variability while balancing than the younger children. More challenging sensory deprivation conditions resulted in less postural sway variability, greater amplitudes, and more frequent correction torques to stabilize[17].

Our findings reveal that only 8% of the participating children had left foot dominance, indicating that the difference may be related to dominance. A similar result was found in previous studies on the influence of laterality in the distribution of plantar pressures[18,19]. Children experience different plantar load patterns in the static analysis, increasing the dominant forefoot pressure and consequently increasing non-dominant hindfoot pressure[19].

The children participating in this study mostly had right foot dominance and greater mean pressures in the left hindfoot. The EO was comparable to the DT condition because it was used as a means of postural stability. A study verified changes in the dynamic analysis when assessing the gait pattern while using the smartphone. One of the attributions of such changes was the reduced visual attention on the environment and the orientation regarding head posture adjustments[20].

In the present study, the environmental information from the device apparently behaved similarly to when the child had their eyes closed in an orthostatic position. This is so because the side-to-side displacement in the smartphone-use condition was greater than in EO and EC. However, observing the ellipse area, the analysis showed that using the smartphone was similar to having the eyes closed. It is believed that the smartphone-use cognitive task did not cause significant lateral posture changes in the children comparing with postural adjustments in the sagittal plane (anteroposterior displacement) and considering the total area.

Studies point out that frequent and prolonged flexed cervical spine to handle electronic devices can trigger musculoskeletal disorders and muscle pains, especially in the head and neck region. Also, promotion and prevention actions regarding cervical diseases in children and adolescents must be implemented to prevent postural deviations and other symptoms[21-23]. In this study, no manipulation was made on the head posture of the children during the tests, as each child was instructed to use the smartphone as they would at home.

Head movement is diminished when using the smartphone, changing both the visual and vestibular signal for postural control stability, as these changes allow the nervous system to optimize postural responses[24]. This explains why the head posture adjustment was diminished while the child was using the smartphone. Possibly, the child's postural adjustments while using the smartphone require a different head and neck orientation, and/or a substantial movement of the upper limb, or even any change in the posture that displaces the center of gravity. Thus, the children do not have yet a fully mature somatosensory system to activate postural adjustments as adults do.

Postural control means controlling the head position in relation to gravity, ensuring balance maintenance, orientation, and positionings of the segments as a reference of postural perception and actions, emerging from the interaction of elements such as the person, task, and environment[25]. Hence, the postural adjustments performed in this study when the children had their eyes are closed were similar to those when they are focused on using the smartphone.

Stimuli of the visual, somatosensory, and vestibular systems are important sources of information on head positioning and body movement. Each of these senses furnishes different information to the central nervous system, with different postural control models[26]. This is explained by the decreased visual field associated with a cognitive task that led to postural instability as with sensory input restriction (total vision restriction with eyes closed). Attention is limited to the cognitive function of the application task, focused on the screen and not on the environment.

The postural adjustments are activated before the voluntary movements, minimizing possible balance disturbances. Postural control requires the processing of attention while performing a single task. When performing simultaneous tasks, the performance may be affected. The motor responses promoted by posture disturbances are postural adjustments commanded by the central nervous system, which depend on information on the task being performed and the environment[27].

Postural control assessment is commonly conducted in orthostasis. However, when the head position is changed, the components involved in postural control may have their function impaired, leading to an increase in postural sway. In this study, we considered that the change was due to the child's posture during the assessment, as they had an attentional demand that made them more unstable in the activity conducted with the smartphone. When focusing on the smartphone screen, the visual attention is diminished along with the physical function of holding the device with the hands and bowing the head which increases the CoP sway area. The restricted visual field associated with a cognitive task causes postural instability, as the dual-task activities, such as using the smartphone while standing, show greater instability and require significant concentration[28].

A previous study investigated the dual-task condition with the smartphone in gait and found a negative impact of dynamic gait instability in young people when walking. This finding may result from the reduced visual field associated with the cognitive task due to the increase in the demand for attention when using the smartphone[29]. In the present study, the children also performed dual tasks with less anteroposterior displacement when using the smartphone, while there was a greater displacement when they had their eyes closed. Hence, the hypothesis is that using excessively this posture in childhood may have negative consequences to their motor development. However, it has not yet been clarified whether this process is temporary or lasting. Further research on this issue may contribute to understanding these factors.

The stability, postural adjustments, and contribution of sensory information to postural control were investigated in children 5 to 12 years old, indicating that postural stability tends to increase as the person grows up and decrease with sensory manipulation. The capacity to perform anteroposterior adjustments was more evident and the sensory maturation occurred first in the visual system, passing through the proprioceptive system, and then in the vestibular system, reaching functional maturity by 9 years old[30].

It is believed that in younger children the ability to use proprioceptive input occurs as in adults. However, the vestibular function seems to take longer to mature and is still developing at 16 years old[31]. The children apparently integrate sensory information for postural control only after finishing the first decade of life, more precisely at 12 years old, corresponding to their postural stability maturation level[32]. In our study, when the sensory input was decreased, a sensory reweighting began, and when the visual was removed the child used strategies of vestibular and somatosensory inputs. Therefore, when using the smartphone, the child has less visual input causing body sway similar to having the eyes closed.

Considering the age when postural control is developed, it is believed that schoolchildren 6 to 9 years old face many unstable activities in their daily tasks, especially in terms of spending hours with mobile devices that may reduce their body stability. Also, it was verified in the results that using the smartphone in the orthostatic position associated with an attentional demand destabilized the children's postural control, as with the eyes closed, in contrast with having their eyes open. Hence, the children had greater postural instability in the activity performed when using the smartphone.

This study has some methodological limitations, such as the non-randomized sequence of testing conditions used with each child. However, our findings revealed that the postural adjustments the child performs with their eyes closed are similar to those that take place when using the smartphone in dual tasks. The results may contribute to understanding the use of technology by children 6 to 9 years old. Future studies must investigate more in-depth the relationship between the use of technology and other aspects of the child's development in attentional and postural dual-task activities to help take preventive measures to prevent the excessive use of electronic devices in childhood. Also, future studies can assess the impact of technology considering different age groups – for instance, children and adolescents.

## Author's contributions

Thiago Weyk de Oliveira Beliche participated in data collection, organization, and preparation of the databank, interpretation and discussion of the results, and writing the text.

Tânia Cristina Dias da Silva Hamu participated in the study design, statistical data analysis, interpretation of the results, and final revision of the article.

Thailyne Bizinotto participated in the study design, submission to the research ethics committee, data collection, and final revision of the article.

Celmo Celeno Porto participated in the study design and final revision of the article.

Cibelle Kayenne Martins Roberto Formiga

participated in the study design, training the team, statistical data analysis, interpretation, writing the text, and final revision of the article.

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**Conflict of interest**

The authors report no conflict of interest.

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**Resumo**

**Introdução:** O uso de dispositivos eletrônicos móveis tem alcançado usuários cada vez mais jovens e tem levado pesquisadores a investigar o impacto dessas tecnologias na saúde da criança em desenvolvimento.

**Objetivo:** Investigar o impacto do uso do smartphone no controle postural de crianças brasileiras de 6 a 9 anos de idade.

**Método:** Estudo transversal realizado com 278 crianças de escolas públicas de Goiânia (GO, Brasil). As crianças foram avaliadas na postura ortostática pelo sistema de baropodometria computadorizada em três condições: olhos abertos, olhos fechados e manuseando um aplicativo gratuito para smartphone.

**Resultados:** As crianças tinham idade média de 8,36 anos, sendo 82% de eutróficas e com tempo médio de tela de duas horas diárias. As análises do controle postural revelaram que as crianças apresentaram maiores ajustes posturais com os olhos fechados em comparação com os olhos abertos e ao usar o aplicativo do smartphone o ajuste postural foi semelhante ao encontrado com olhos fechados. Na estabilometria, os deslocamentos posturais realizados pelas crianças se comportaram de modo semelhante à avaliação estática apenas na área total da superfície dos pés.

**Conclusão:** O uso do smartphone e a ausência do estímulo visual na posição ortostática promoveram instabilidade postural nas crianças de 6 a 9 anos de idade. Estes achados podem contribuir para o conhecimento do impacto de tecnologias no desenvolvimento do equilíbrio de crianças em atividades diárias.

**Palavras-chave:** desenvolvimento infantil, equilibrio, controle postural, tempo de tela.