

## **The Impact of Mobile Phone Use on Adolescent Health**

**Antônio Gelcivan Carvalho Feitosa**

gelcycarvalho@gmail.com

Centro Universitário Metropolitano de Manaus – FAMETRO

**Márcio Ribeiro da Silva**

marciosilva106@gmail.com

Centro Universitário Metropolitano de Manaus – FAMETRO

**Matheus Nery de Souza Ferreira**

matheusnery345@gmail.com

Centro Universitário Metropolitano de Manaus – FAMETRO

**Bruno Pereira Gonçalves (Advisor)**

goncalves.bruno@gmail.com

Centro Universitário Metropolitano de Manaus – FAMETRO

**Jean Mark Lobo de Oliveira**

jeanlobolive@gmail.com

Centro Universitário Metropolitano de Manaus – FAMETRO

**Rilmar Pereira Gomes**

rilmargomes@hotmail.com

Centro Universitário Metropolitano de Manaus – FAMETRO

**David Barbosa de Alencar**

david002870@hotmail.com

Centro Universitário Metropolitano de Manaus – FAMETRO

### **Abstract**

*With the increasing rise of smartphones among adolescents, the question arose about the impact of the use of mobile phones among this audience, seeking to assess the harms caused by their excessive use. The present work was elaborated through bibliographical research in articles, books and websites, in a non-systematic way through qualitative and quantitative research, analyzing printed questionnaire. Regarding the results related to the problems caused by the use of smartphones, such as lack of attention, indisposition, poor school performance, little interaction in the classes kept an average of 22.5% difference for those who felt affected, about the posture we have a relatively few. high, however, is still less than half of respondents, but only 33.75% of people who do not worry about posture when using the phone showing, therefore, that young people, focus of our research, has a good ergonomic behavior, both when using the*

*smartphone and watching classes, picking up objects on the floor, and sitting in the chair.*

**Keywords:** Smartphone; Postural Changes; Cell Phone Overuse;

## 1. Introduction

According to (IBGE, 1990), the adolescent becomes the subject aged between twelve and eighteen, according to the Child and Adolescent Statute [1].

With the increasing number of handsets, and hence the price drop, Brazil has advanced to the fifth largest smartphone-using country in the world [2]. As a cheaper form of entertainment and applications that can connect people from different places, it is even more beneficial to use them, as phone lines have become an outdated medium and have higher costs.

Thus, according to a survey by Hootsuite and We Are Social, Brazil ranks third among the countries that spend the most time using mobile phones, a survey of people aged 16-64 [3]. Taking into account the time spent on mobile phones, social networking sites, current news search, search / search engine, downloading music and videos and sending / receiving emails and text messages / SMS are the main purposes that Teenagers tend to do it when they are using cell phones, according to a survey by the National Youth Secretariat (SNJ) in 2013 [4].

As a form of entertainment, the use of cell phones brings with its health risks to the adolescent that, added to school factors such as poor posture when sitting, turns out to be the beginning of several degenerative spinal problems in adulthood [5]. For that, the meanings for a good posture are diverse. According to Hullemann (1978), posture can be considered as the balance imposed through the muscles, ligaments and intervertebral discs [6]. However, lucid or not, the posture is also associated with the internal feeling or its absence, which will reflect to the observer through the posture itself or when we move [7].

Therefore, the negative aspects brought by mobile devices should be explained, both regarding problems in everyday school life (disinterest, tiredness and problems in learning), as well as problems regarding poor posture when using mobile devices daily.

## 2. Methodology

Through non-systematic reviews: based on obtaining non-critical data from renowned authors and bibliographic reviews, through the topics: School Impact and Postural Problems in the Use of Cellular Devices, a qualitative and quantitative research was conducted to obtain data through schools and universities through printed questionnaires. The research will be done with high school and college students, in which ages vary between 14 and 27 years. The answers obtained were 48 male and 30 female and 2 females did not report gender, however, the amount of response of each gender was not balanced and the data collected are shown in tables 1 and 2 below. .

Thus, an exploratory research will be assembled with questions about the postures adopted in daily life based on the article by Juliana Benini and Ana Paula Barcellos [8], in addition to the problems that the use of the mobile device causes during the day and before bed, due to its irrational use. From the questionnaire and the empirical objects, the level of disinterest, the level of tiredness both in class and in other places

they attend, will be investigated from the social / school impact, as well as school performance (grades, participation, learning).

Table 1 - Question about mobile phone use

Do you use your mobile device before bed?	Yes	Not
Do you feel tired, unwell the other day due to mobile phone use at night?	Yes	Not
Do you feel the learning is impaired due to the constant use of the cell phone?	Yes	Not
Does it resemble the lack of class participation due to cell phone use?	Yes	Not
Resembles low grades due to cell phone use?	Yes	Not
When performing any activity (school, home, work, reading), is mobile mode switched off, or mobile data, Wi-Fi off, or airplane mode switched off?	Yes	Not
Do you have a tool that favors the more rational use of mobile?	Yes	Not
At dusk, does it dim the phone screen, or put the glow in night mode?	Yes	Not
Turn off Wi-Fi or put your phone in airplane mode before bed?	Yes	Not
Do you sleep with your phone under the pillow or near the bed?	Yes	Not
How many hours a day do you use your phone?		

Source : Own Author

Table 2 - Questionnaire about the positions adopted on the column.

Spine position in sitting posture when using cellphone.	Straight, leaning against the chair	Bent over against the chair	Bent away from the chair	Do not know
Foot position in sitting posture when using mobile phone.	Reach the ground, feet flat	Hanging feet	Reach the floor, sitting on the edge of the chair	Only the tiptoes reach the floor
Position when attending class.	Sitting back to back	Sitting, back sliding over chair	Other	
Pick up objects on the floor	Bending the back Bending the knees		Bending the back Bending the knees	

Source : Own Author

Following the context of Van den Bulik's [9] survey of 1,656 adolescents over a 12-month period, it proved that those who used their cell phone during their sleeping period showed fatigue, malaise the other day.

Through this research, a questionnaire about the use of the mobile device was prepared. However, beginning basically at school age, we have the pathophysiology of the spine, Kendal et al (1999) [10]. According to the same, around the age of seven, occurs the first episode of acceleration and bone growth, named as growth spurt. However, in both females and males, the second growth spurt occurs approximately between the ages of eleven and fourteen. Thus, the bad posture adopted by this age group, ends up generating proportions in several muscle groups, according to César (2004), which, consequently, start factors for spinal dysfunction, which stimulate the appearance of diseases such as : hyper lordosis, scoliosis, hyper kyphosis, among others, according to Schmidt (1999) [11]. Based on this knowledge, the above questionnaire was assembled to obtain information about the ergonomic postures of the school population.

### **3. Theoretical References**

#### ***3.1. Harmful health effects due to use of the handset***

People who have televisions, video games, cell phones in their rooms feel the most tired the other day from handling these devices instead of sleeping [16], but in addition to tiredness, diseases such as obesity and depression they are related, according to a survey by King's College in London of 125 198 people between 6 and 19 years of age from various countries. Just having a cell phone in your room without using it can already affect the rest period, due to the expectation of notifications arriving (receiving messages, calls, etc.). Sleeping poorly or poorly can cause damage to both mental and physical health, including impaired immune system, stunted growth and mental problems (depression and suicidal tendencies), and lead to more serious illnesses such as cancer or heart attacks. [17] .

In a school or learning environment, cell phone use reduces or even takes away student concentration, as taking turns between moving the phone and paying attention in class can result in stress and even Attention Deficit Disorders (ADHD), consequently, a drop in school performance tends to be greater [18]. One of the factors that is directly related to good grades is having a good night's sleep, since cognitive or behavioral problems in the classroom are related to a bad night's sleep [19].

#### ***3.1.2. Link between cell phone use and lack of postural quality***

Because cell phones become indispensable in our daily lives, they show that their use is of fundamental importance, both to talk to someone on the other side of the planet and to get around the city where they live, but people end up adopting bad postures in its use [12]. For their convenience, adopting a stance in which the head is fixed downward looking straight at the phone answering text messages, watching videos and even playing ends up having an effect in what is described by the term "Text Neck". "Text Neck" [13], and over time the body's natural physiology ends up changing, leaving the user with the head forward [14], in addition to leading to musculoskeletal injuries [15].

As much as students strive to maintain a good posture, the continuity of the same tends to end, and thus, among the various postural changes that can be found in students, scoliosis is highlighted [20].

### 4. Result

Table 3: Data collected from school and university regarding cell phone use.

	Yes	Not
They use their cell phone before bed.	78	2
They feel tired, unwell the other day due to their mobile phone use at night.	29	51
They feel learning is impaired due to the constant use of their cell phones.	35	45
They resemble the lack of participation in classes due to the use of mobile phones.	31	49
They resemble poor grades due to cell phone use.	29	51
While performing some activity (school, home, work, reading), the mobile data, Wi-Fi or airplane mode is switched off or the mobile phone is switched off.	33	47
They have some tool that favors the more rational use of mobile.	30	50
At dusk, they darken the screen of the phone, or put the brightness in night mode.	38	42
Turn off Wi-Fi or put your phone to airplane mode before bed.	24	56
They sleep with their cell phone under the pillow or near the bed.	63	17
Average hours per day that usually use the phone.	8.93	

Source : Own Author

Table 3 shows that most people use their cell phones before bed, however, the similarity between tiredness, indisposition, lack of participation in classes and low grades does not have a direct link with cell phone use, as shown in Table 3 shows that more than half of the participants do not resemble the survey topics.

Figure 1 shows the results of Yes - Data collected from school and university conditions regarding cell phone use.

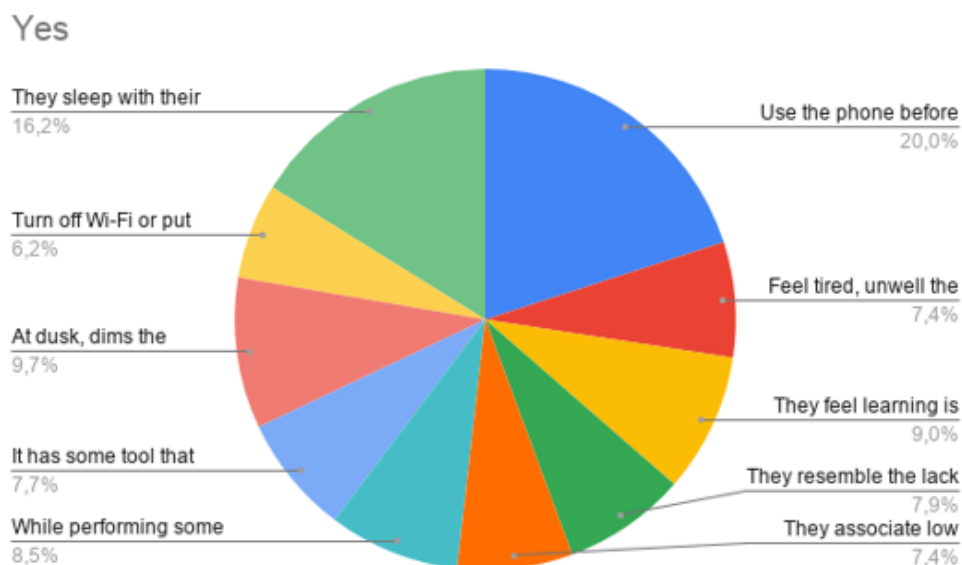


Figure 1 – YES: Data collected from school and university regarding cell phone use.

Source : Own Author

However, the difference in the number of people who do not feel tired, unwell the other day due to the use of mobile phones during the night; do not feel the learning impaired due to the constant use of the cell

phone; do not resemble the lack of participation in the classes due to the use of the cell phone; and do not resemble poor grades due to cell phone use are relatively small, with differences of 22 (27.5%), 10 (12.5%), 18 (22.5%), 22 (27.5%) respectively, for people who resemble. This shows that people do have a lack of sensitivity when it comes to mobile phone use, since the causes felt the other day are linked to smartphone use at night, according to Brunborg [16], as well as notes. which, by a difference of only 22 (27.5% of the candidates) people, resemble the use of the cell phone with the obtained low grades. Even though most of the candidates do not resemble the topics in table 1 with their mobile phone use, it is still worrying that the number of people they resemble is relatively high, for example having poor learning or having little participation in them. classroom due to mobile phone use being almost half of the participants, 35 (43.75%) and 31 (38.75%) respectively.

Figure 2 shows the results of No - Data collected from school and university conditions regarding cell phone use.

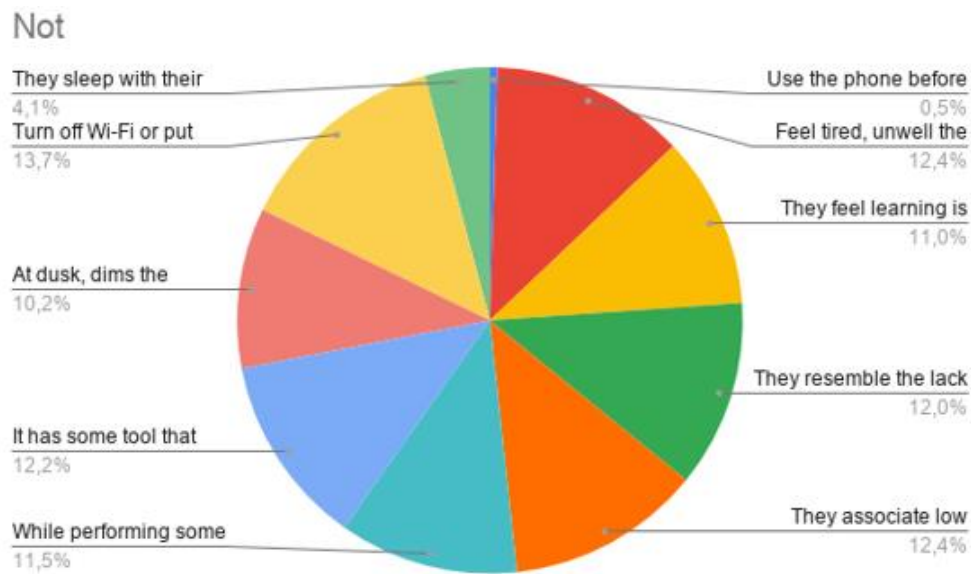


Figure 2 – NO: Data collected from school and university regarding cell phone use.

Source : Own Author

Despite the various tools that exist to control smartphone use, people do not possess, with 50 (62.5% of candidates) people, as shown in table 3, so it becomes even more complicated to have a good daily performance once that the unreasonable and rampant use of cell phones disrupts study, reading, routine tasks, and, as shown in table 3, on average 8 hours and 9 minutes per day is spent per day just for using the smartphone.

Table 4: Data collected from school and university regarding daily posture.

<b>Spine position in sitting posture when using cellphone.</b>	
Straight against chair	34
Bent over against the chair	27
Bent away from chair	5
Do not know	14
<b>Foot position in sitting posture when using mobile phone.</b>	
Reach the floor, feet flat	51
Hanging Feet	21
Reach the floor, sitting on the edge of the chair	3
Only the toes reach the floor	5
<b>Position when attending class.</b>	
Sitting back to back	56
Sitting, back sliding over chair	23
Another	1
<b>Pick up objects on the floor.</b>	
Bending the back	33
Bending the knees	47

Source : Own Author

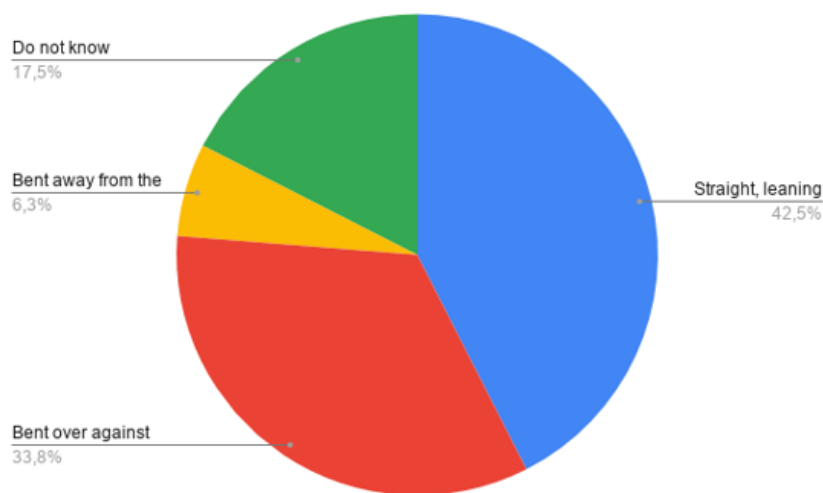


Figure 3 - Spine position in sitting posture when using cellphone.

Source : Own Author

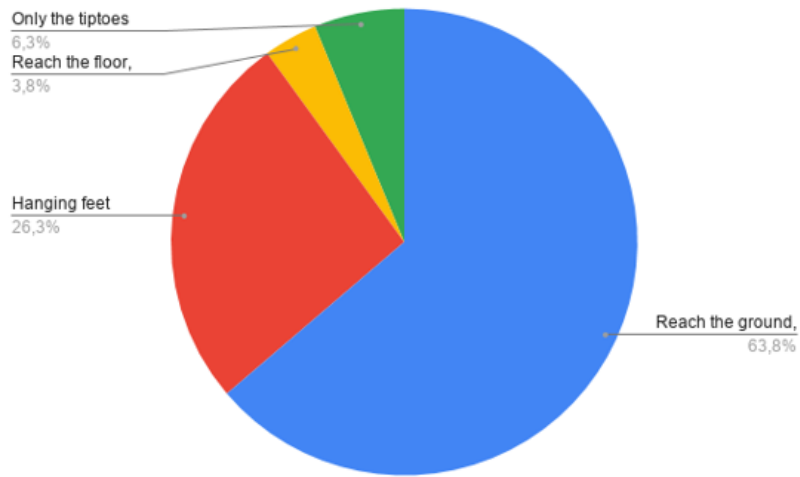


Figure 4 - Foot position in sitting posture when using mobile phone.

Source : Own Author

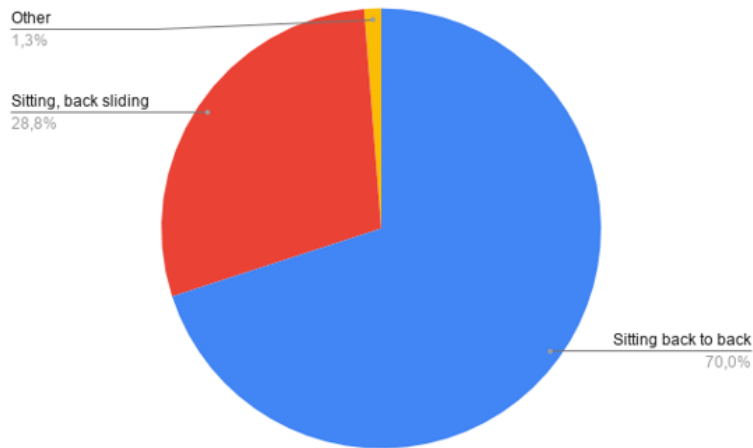


Figure 5 - Position when attending class

Source : Own Author

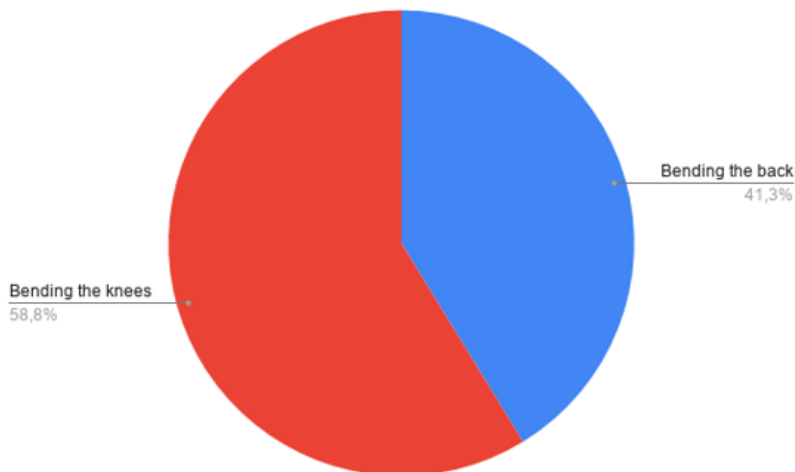


Figure 6 - Pick up objects on the floor.

Source : Own Author

Even with this rapid connectivity between mobile phone users, obtaining agile information, urban and



personal ease, but its use can bring ergonomic problems. However, as shown in table 2, students end up adopting positive attitudes regarding their daily lives. Almost half of the participants, 34 (42.5%), use a correct posture when using the mobile device, being this - straight, leaning on the chair - however, is still worrying the number of people who do not have a correct posture when using the mobile phone, 27 (33.75%) participants.

The same applies to the sitting position of the feet, in which 51 (63.75%) participants use the correct position of the feet when sitting, as well as, when attending class, most participants adopt a healthy posture in the sitting position. which refers to sitting with the back supported, being 56 (70%) of the participants. With regard to picking up objects from the floor, the participants also observed good conduct, 47 (58.75%), bending the knees instead of the back, thus showing a good knowledge about healthy postures.

## **5. Discussion**

The results found in the present study suggest that a portion of the people interviewed in this research have a tendency to have difficulty in reconciling studies with the healthy use of mobile phones, aiming that about 35 (43.75%) respondents feel harmed due to constant use. followed by 31 (38.75%) who tend not to pay attention in class due to the use of mobile, as shown in table 1, raising a discussion about what should be done to minimize these numbers. One of the first measures would be the re-education on the use of mobile phones for those with attention deficit, on the other hand these data could be used by teachers looking for a methodology that involves students' cell phones, making the classes dynamic or even a change in the current approach. aiming to hold students' attention. In Table 2, we observed that 51 (63.75%) are concerned with the correct posture, although more than half, the percentage of people with a bad posture is large which causes health problems, the most common is scoliosis [ 20].

## **6. Conclusion**

Thus, knowing that Brazil is one of the countries that most use smartphones in the world. It has become an almost indispensable tool these days. On the other hand, there is harm brought on by the constant use of the cell phone, attention deficit, loss of productivity, ergonomic problems among other diseases. When thinking about the problems, we can note that the debate on the topic is extremely important, so also looking for ways to get around and get better use of technology in our daily lives. Therefore, reeducation is the best way for those who are harmed by the excessive use of the cell phone, aiming at rest of sight, self-monitoring of sitting posture, getting up to get something and thus seeking a high knowledge of the limits of our body, to a harmony in academic, personal life, not forgetting physical exercises. Given this, seek to reduce the number of people harmed by the use of mobile.

## **7. References**

- [1] Colectivo de Autores, Informática Médica. Editorial Ciencias Médicas, 1999. Tomo 1 pp 16-77 ISBN 959-7132-06-0. Cuba.
- [2] C. N. Prague, W.C. Amo and J.D. Foxall. Los Secretos de Access 97. Editorial Anaya Multimedia.

01/01/1997, pp. 25-48, 2010.

- [3] M. Castelles. El impacto de las nuevas tecnologías en la economía internacional: implicaciones para la economía española, Madrid: Instituto de Estudios de Prospectiva. 1990, p.p. 461-491.
- [4] M. Castelles. La ciudad informacional. Tecnologías de la información estructuración económica y el proceso urbano-regional, Madrid: Alianza Editorial, 1995, p.p. 125-129.
- [5] KNUSEL, O.; JELK, W. Sitzbale und ergonomisches mobiliar im schulzimmer. Schweiz Rundschau Med (Praxis), v. 83, n. 14, p.407-413, 1994.
- [6] HULLEMANN, K. B. Col. Medicina esportiva: clínica e prática. Tradução por Wolfgang Zorn e outros. São Paulo: EPUD, EDUSP, p. 160-168, 1978.
- [7] CAILLIET, R. Lombalgias - síndromes dolorosas. 3. ed. São Paulo: Manole, 1988. \_\_\_\_\_. Tecidos moles dor e incapacidade. São Paulo: Manole, 1979.
- [8] BENINI, Juliana; KAROLCZAK, A. P. Barcellos, Fisioter. Pesqui. vol.17 no.4 São Paulo Oct./Dec. 2010, ISSN 1809-2950. Disponível em: <http://dx.doi.org/10.1590/S1809-29502010000400012>. Acesso em: 31 agos. 2019.
- [9] Van den Bulck J. Adolescent use of mobile phones for calling and for sending text messages after lights out: results from a prospective cohort study with a one-year follow-up. Sleep 2007;30:1220-3.
- [10] KENDALL, F.P. et al. Músculos, Provas e Funções. 4ª ed. São Paulo, Manole, 1999.
- [11] SCHMITH, A. Estudo das alterações morfológicas do sistema locomotor em escolares do ensino fundamental – faixa etária entre 7 e 14 anos de ambos os sexos do município de Marechal Cândido Rondon, PR – Através da valiação postural computadorizada. 1999. 105 f. Dissertação (Mestrado em Educação Física) - Faculdade de Educação Física, Universidade Estadual de Campinas, Campinas, 1999.
- [12] KYUNG, W. et al. Effect of sitting posture on respiratory function while using a smartphone. The Journal of Physical Therapy Science, p. 1496–1498, 2016.
- [13] LEE, M. et al. The effects of smartphone use on upper extremity muscle activity and pain threshold. J. Phys. Ther. Sci, v. 27, p. 1743–1745, 2015.
- [14] GOLD, J. E. et al. Postures, typing strategies, and gender differences in mobile device usage: na observational study. Applied Ergonomics, v. 43, n. 2, p. 408–412, 2012.
- [15] GONÇALVES, R. O uso abusivo de telefones celulares pode causar lesões nas mãos. Revista Elite, 2015. Disponível em: <http://www.revistaelite.com.br/index.php/component/k2/itemlist/tag/celular>. Acesso em: 14 set. 2019.
- [16] BRUNBORG, G. S. et al. The relationship between media use in the bedroom, sleep habits and symptoms of insomnia. Journal of sleep research, v. 20, n. 4, p. 569–75, dez. 2011.
- [17] STOCK, A. Celular antes de dormir afeta sono, hormônios e desenvolvimento infantil. BBC News Brasil, 2018. Disponível em: <https://www.bbc.com/portuguese/geral-42603165>. Acesso em: 16 set. 2019.
- [18] VIRTUAL, E. Entenda como o uso excessivo do celular pode atrapalhar os estudos. Explicador Virtual, 2017. Disponível em: <https://blog.explicadorvirtual.com.br/entenda-como-o-uso-excessivo-do-celular-pode-atrapalhar-os-estudos/>. Acesso em: 16 set. 2019.
- [19] NINA. O uso do celular e as consequências negativas para o rendimento escolar. Instituto Dom Barreto, 2016. Disponível em: [http://dombarreto.g12.br/portal/?p=12165&utm\\_source=blog&utm\\_campaign=rc\\_blogpost](http://dombarreto.g12.br/portal/?p=12165&utm_source=blog&utm_campaign=rc_blogpost). Acesso em:

16 set. 2019.

[20] Pereira LM, Barros PCC, Oliveira MND, Barbosa AR. Escoliose: triagem em escolares de 10 a 15 anos. *Rev Saúde Com.* 2005;1(2):134-43.