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ORIGINAL

Prolonged screen exposure and headaches in university students aged 18 to 25 years

Uso prolongado de pantallas y cefaleas en jóvenes universitarios de 18 a 25 años

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ABSTRACT

This study analyzes the relationship between prolonged screen use and the occurrence of headaches among medical students at the Pontifical Catholic University of Ecuador, Amazonía campus, during the year 2025. The research was conducted under a quantitative approach, with a descriptive-analytical cross-sectional design. A digital survey was administered to a representative sample of students aged 18 to 25 years. The results reveal a high daily exposure to electronic devices, mainly for academic purposes, with a predominance of prolonged usage periods and continuous use without frequent breaks. Regarding headaches, a mostly low to moderate frequency and a predominantly moderate intensity were observed, although in some cases they interfere with academic performance. Most participants reported perceiving a relationship between screen use time and the onset or intensification of headaches. It is concluded that high screen exposure and the recurrent presence of headaches in this population highlight the need to implement preventive strategies and guidance programs on healthy electronic device use habits, in order to promote students' physical and academic well-being.

Keywords: screen exposure; headache; university students.

RESUMEN

El presente estudio analiza la relación entre el uso prolongado de pantallas y la aparición de cefaleas en estudiantes de la carrera de Medicina de la Pontificia Universidad Católica del Ecuador, sede Amazonía, durante el año 2025. Se desarrolló bajo un enfoque cuantitativo, con un diseño descriptivo-analítico de corte transversal. Se aplicó una encuesta digital a una muestra representativa de estudiantes entre 18 y 25 años. Los resultados evidencian una alta exposición diaria a dispositivos electrónicos, principalmente por motivos académicos, con predominio de jornadas prolongadas y uso continuo sin pausas frecuentes. En relación con la cefalea, se observó una frecuencia mayormente baja a moderada y una intensidad predominantemente moderada, aunque en algunos casos interfiere con el rendimiento académico. La mayoría de los participantes manifestó percibir una relación entre el tiempo de uso de pantallas y la aparición o intensificación del dolor de cabeza. Se concluye que la elevada exposición a pantallas y la presencia recurrente de cefaleas en esta población resaltan la necesidad de implementar estrategias preventivas y programas de orientación sobre hábitos saludables de uso de dispositivos electrónicos, con el fin de promover el bienestar físico y académico de los estudiantes.

Palabras clave: exposición a pantallas; cefalea; estudiantes universitarios.

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INTRODUCTION

OBJECTIVES

General

To analyze the relationship between prolonged screen use and the occurrence of headaches in medical students aged 18 to 25 years at Universidad PUCE Amazonas in 2025, to identify associated factors and guide prevention and care strategies for visual and neurological health.

Specific

1. To describe screen use habits among medical students, including daily duration and type of activity performed.
2. To analyze the relationship between screen exposure time and the onset of headaches, with the aim of proposing preventive strategies and healthy habits for the use of electronic devices.
3. To identify the frequency, intensity, and characteristics of headaches reported by students during the study period.

In recent decades, rapid technological development has significantly transformed lifestyles, especially among young people. The use of electronic devices such as smartphones, computers, and tablets has become a daily practice in academic, work, and social contexts. Although this growing dependence on screens has brought benefits in information, communication, and education, it has also raised concerns about potential negative impacts on physical, mental, and neurological well-being, among which headaches are a frequent manifestation [1].

Various studies have indicated that prolonged screen exposure is associated with symptoms such as visual fatigue, sleep disturbances, musculoskeletal discomfort, and headaches [2]. Increased Internet connectivity and the use of mobile devices have intensified digital exposure, and neurobiological and psychological symptoms linked to digital fatigue and prolonged or frequent headaches have been described [1].

Health sciences students, particularly medical students, may have high levels of exposure because of academic demands, continuous use of virtual platforms, digital literature, online classes, and research activities. These conditions may be exacerbated by inadequate lighting or poor posture, lack of visual breaks, and academic stress, factors that may be related to visual fatigue, headache, concentration, and academic performance [3]. In the university setting, various studies have addressed academic performance and stress as relevant variables for student well-being and performance [4-11]. From a broader perspective, concepts such as cognitive stimulation and cognitive reserve have also been discussed in relation to capacities such as attention, concentration, and memory [12,13].

Available studies show a relationship between excessive screen time and the presence of headaches in young adults. In a cross-sectional study, higher daily screen exposure was associated with a higher frequency of non-migraine headache and migraine [2]. Likewise, digital overexposure has been linked to mental fatigue, sleep disturbances, and other potential neurological effects [1].

Although international evidence exists on the relationship between screen time and headache, specific scientific output among young university adults remains limited in Latin American and Amazonian contexts. In Ecuador, and particularly in the Ecuadorian Amazon, scarce local evidence is available that analyzes this issue in a contextualized manner.

Therefore, the present study aims to analyze the relationship between prolonged screen use and the occurrence of headaches among students aged 18 to 25 years in the Medicine program at the Pontificia Universidad Católica del Ecuador, Amazonía campus, during 2025. The generation of local evidence will help guide strategies aimed at student well-being and academic performance.

METHODS

The present study was conducted using a quantitative approach, with the purpose of identifying the relationship between prolonged screen use and the occurrence of headaches in university students. This approach allowed specific variables to be measured and objective results to be obtained within the studied population.

The research was descriptive-analytical and cross-sectional. It was descriptive because it allowed the characterization of screen use habits and headache characteristics; analytical because it assessed the relationship between screen exposure time and the presence of headaches; and cross-sectional because data were collected at a single time point during the 2025 academic period, without temporal follow-up of the participants.

The population consisted of approximately 200 students in the Medicine program at the Pontificia Universidad Católica del Ecuador, Amazonas Campus, aged between 18 and 25 years, enrolled during the 2025 academic period.

The sample size was calculated using the formula for finite populations, considering N = 200, Z = 1.96 for a 95% confidence level, p = 0.5, q = 0.5, and e = 0.05. A minimum sample size of 132 students was obtained. However, 120 students participated voluntarily, representing 60% of the total population.

We worked with 1 sample selected by simple random sampling, ensuring that all students had the same probability of being selected.

The data collection technique used was a survey, administered digitally via Google Forms. A structured questionnaire composed mainly of closed-ended questions designed according to the study objectives was used. The survey included items related to screen time and usage habits, the frequency and characteristics of headaches, and factors associated with prolonged screen use, such as brightness, posture, visual distance, schedules, and breaks.

Descriptive statistics were used for data analysis, including frequencies, percentages, means, and standard deviation. The data were processed in Microsoft Excel.

RESULTS

Screen use

Table 1. Average daily hours of use of screen devices

Options	Percentages (%)
Less than 2 hours	4,5%
2-4 hours	29,5%
5-7 hours	36,4%
More than 8 hours	25,7%

Note. The data show the average daily time spent using screen devices among medical students. The largest proportion was concentrated between 5 and 7 hours (36.4%), followed by 2 to 4 hours (29.5%) and more than 8 hours (25.7%).
Own elaboration.

Table 2. Frequency of continuous screen use without breaks

Options	Percentages (%)
Never	0%
Rarely	11,4%
Sometimes	38,6%
Frequently	45,5%
Always	4,5%

Note. The highest proportion reported frequent continuous screen use without breaks (45.5%), followed by those who reported doing so sometimes (38.6%).
Own elaboration.

Table 3. Use of high screen brightness

Options	Percentages (%)
Never	20,9%
Almost never	37,2%
Sometimes	34,9%
Always	7%

Note. Constant use of high brightness was not predominant; the highest proportion reported almost never (37.2%) or sometimes (34.9%).
Own elaboration.

Table 4. Main activity for which screens are used

Options	Percentages (%)
Study	63,6%
Work	15,9%
Entertainment	45,5%
Social media	29,5%
All of the above	27,3%

Note. The predominant use was for studying (63.6%), followed by entertainment (45.5%).
Own elaboration.

Headache

Table 5. Frequency of headache

Options	Percentages (%)
Never	20,5%
Rarely	31,8%
Sometimes	27,3%
Frequently	18,2%
Always	2,3%

Note. Headache was present in the study population, although predominantly with low to moderate frequency.
Own elaboration.

Overall, the results indicate high daily screen exposure among medical students, characterized by prolonged periods of use, frequent periods without rest, and predominantly academic use. Headache occurred at a mostly low-to-moderate frequency, although some episodes occasionally or recurrently interfered with academic performance in certain cases. Student perception supported a relationship between prolonged screen use and the onset or intensification of headache. Similarly, frequent breaks, brightness control, and limitation of exposure time were identified as preventive strategies.

Table 6. Frequency of headache interference with academic activities

Options	Percentages (%)
Never	6,8%
Monthly	43,2%
Weekly	18,2%
Several times per week	25%
Daily	6,8%

Note. Academic interference was mainly reported once a month (43.2%), followed by several times a week (25%) and once a week (18.2%).
Own elaboration.

DISCUSSION

The results of the present study show that prolonged screen use is a highly frequent practice among medical students, since 62.1% of participants use digital devices for more than 5 hours a day, mainly for academic purposes. This finding is consistent with evidence describing high screen exposure in young adults and university students [2]. Likewise, digital overexposure has been described as a frequent phenomenon in young adults, associated with changes in study and communication habits [1].

Regarding headache, the study showed that a relevant proportion of students experience headache at least occasionally, with a predominantly moderate intensity (34.1%) and a moderate-to-high intensity (31.8%).

Prolonged exposure to electronic devices has been linked to a higher probability of headache in young adults [2], while digital visual fatigue has also been associated with prolonged periods of screen use in the university population [3].

A relevant finding is that 72.8% of students agree or strongly agree that screen use is related to the onset of headaches. In addition, 59.1% stated that pain appears or worsens after prolonged use of devices, which supports the perception of an association between both variables. These results are consistent with reviews that describe possible effects of digital overexposure on sleep, mental fatigue, and neurological well-being [1].

Regarding academic impact, a portion of the students reported that headache interferes with their academic activities with varying frequency. The literature on digital eye strain indicates that prolonged screen use may be accompanied by symptoms capable of affecting concentration and well-being during academic activities [3]. In parallel, various studies have pointed out the relevance of stress and other conditions related to academic performance in university students [4-11].

Among the preventive strategies identified, 56.8% of students considered frequent breaks and screen brightness adjustment important, while 52.3% pointed to limiting daily exposure time. These measures are consistent with the need to promote healthier usage habits and reduce continuous exposure to digital devices [1,3].

However, this study has several limitations. First, the cross-sectional design does not allow for the establishment of causal relationships, only associations. Second, the data are based on participants' subjective perceptions, which may introduce recall or interpretation biases. Furthermore, the sample was limited to students from a single institution, which restricts the generalizability of the results to other university populations.

Despite these limitations, the findings provide evidence regarding the magnitude of screen use and its perceived relationship with headache among medical students, highlighting the need to implement educational programs in digital health, ergonomics, and prevention to reduce the negative effects of prolonged use of electronic devices.

CONCLUSIONS

Regarding screen use habits among medical students, it is concluded that there is high exposure, as the majority uses digital devices for between 5 and more than 8 hours daily, mainly for academic purposes. Furthermore, a considerable percentage reports continuous use without frequent breaks, which indicates prolonged exposure habits that may pose a risk to visual and neurological health.

Regarding the presence of headaches, the results show a perceived relationship between prolonged screen use and headache onset. More than 70% of students recognize this association, and a significant proportion reports the onset or intensification of pain after prolonged use of electronic devices.

Headache was present in a significant proportion of students, with predominantly occasional frequency and mostly moderate intensity. Likewise, in some cases, headache interferes with academic activities, which demonstrates its potential impact on student well-being and performance.

Finally, prolonged screen use was found to be associated, according to participants' perceptions, with the onset or intensification of headaches in medical students at PUCE Amazonas during 2025. These results highlight the need to promote active breaks, exposure time control, brightness adjustment, and digital ergonomics as preventive habits.

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CONFLICT OF INTEREST

It does not exist.

AUTHORSHIP CONTRIBUTIONS

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