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Preventive interventions to improve visual and emotional health in young university students: A public health approach

Laura Belkis Parada Romero
edla2000@gmail.com
Universidad Cooperativa de Colombia
Darío Esteban Recalde Morillo
Universidad Autónoma de Occidente
Juan Jose Valencia Álvarez
Universidad Cooperativa de Colombia
Angie Liseth Moreno Diaz
Universidad Cooperativa de Colombia

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Laura Belkis Parada Romero,

Cooperative University of Colombia, Avenida Caracas # 37-63, Bogotá, Colombia, 111311.edla2000@gmail.com, 0000-0003-2990-0515

Darío Esteban Recalde Morillo,

Universidad Autónoma de Occidente, Calle 25 # 115-85, km 2 Vía Cali – Jamundí Cali, Valle del Cauca. 760030 derecalde@uao.edu.co

Juan Jose Valencia Álvarez

Cooperative University of Colombia, Avenida Caracas # 37-63, Bogotá, Colombia, 111311.juan.valenciaal@campusucc.edu.co, 0009-0007-7903-7197

Angie Liseth Moreno Diaz

Cooperative University of Colombia, Avenida Caracas # 37-63, Bogotá, Colombia, 111311.angie.morenodiaz@campusucc.edu.co, 0009-0000-5381-8779

Corresponding Author: Laura Belkis Parada Romero, edla2000@gmail.com

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Ethical consideration:

This study was conducted in accordance with applicable Colombian regulations governing research involving human participants, particularly Resolution 8430 of 1993, and the ethical principles of the Declaration of Helsinki, as applicable to the study. The research was reviewed and approved by the Research Bioethics Committee of the Cooperative University of Colombia (Bioethical Concept No. BIO681; Act No. 8, September 16, 2024). Informed consent was obtained from all participants before their inclusion in the study.

The Research Bioethics Committee of the Cooperative University of Colombia, created by Agreement No. 02 of April 28, 2006, decided to grant its approval to the project entitled “Preventive Interventions to Improve Visual and Emotional Health in University Students: A Public Health Approach.” This approval

is granted according to Bioethical Concept No. BIO681 issued by the Bioethics Subcommittee of the Villavicencio Branch, through Act No. 8 of September 16, 2024, which reviewed the ethical components and the instruments that will be used in the Project.

Consent Declaration

Informed consent was obtained from all participants included in the study. Participants were informed about the purpose and procedures of the study, and their participation was voluntary.

Declaration of Conformity

All methods and procedures used in this study were carried out in accordance with the relevant guidelines, regulations, and applicable ethical standards. The study was conducted in compliance with the principles governing research involving human participants.

1. Introduction

The increasing use of computers, smartphones, and other digital devices in university education has raised concerns about students' visual and emotional health. Prolonged screen exposure has been associated with digital eye strain and symptoms such as eye fatigue, dry eyes, headaches, and musculoskeletal discomfort (1–3). These concerns may be intensified by academic demands, insufficient sleep, and the combination of study with work and other responsibilities (4,5).

Although previous research has documented visual symptoms and factors associated with digital-device use, less is known about how visual health, emotional well-being, sleep, academic demands, and digital habits converge within the same university

student population. This is particularly relevant because these factors may interact and influence students' ability to study, maintain healthy routines, and seek appropriate support. Research in Colombia has identified a high prevalence of computer vision syndrome among university students, but further evidence is needed to characterize these interconnected risk factors and students' perceptions of available institutional support (11).

Therefore, this study examines visual and emotional health among university students from the Cooperative University of Colombia and the Autonomous University of the West. It identifies risk and protective factors related to screen use, sleep, stress, academic demands, coping strategies, and institutional support. By considering these dimensions together, the study contributes an integrated description of the visual and emotional health needs of university students and provides evidence to guide preventive interventions and health-promotion strategies in academic settings.

1.1 Abstract

This descriptive study analyzes research on visual and emotional health in academic environments. It seeks to objectively survey students at the Cooperative University of Colombia (UCC) and the Autonomous University of the West (UAO) across multiple campuses in order to propose and develop intervention tools using a mobile application. This descriptive, exploratory study includes a phase of understanding the

phenomenon through documentary research and an empirical-analytical phase. Four digital survey instruments were administered. The results of three separate questionnaires show that 83 % of 312 students report visual fatigue associated with prolonged screen use. 37.4% of 222 students report weekly recurring stress or anxiety, 37.4% few times per month and 8.6% daily. 91.3% report insufficient sleep (between 5 and 6 hours or less), and 91.4% believe the university does not provide information on visual health or they are uninformed or insufficient. The study concludes that visual and emotional health are directly related. Stress exacerbates visual discomfort, hindering adequate concentration and efficient performance, due to exposure to risk factors, long workdays, and a lack of preventive practices. While self-care strategies are positive, they don't have the desired impact. It is suggested that prevention programs and visual health campaigns focused on healthy habits be designed.

Keywords: Digital fatigue, Emotional well-being, Eye health, Precautionary measures, Preventive measures.

2. Methods

Three data collection instruments were administered to university students at the Cooperative University of Colombia (UCC) and Colombia's Autonomous University of the West (UAO). These instruments were designed as digital forms: three on the Google Forms platform and one on the Microsoft Forms platform, structured using perception scales and a Likert-type frequency scale. Form 1 (n = 312), Form 2 (n = 222), and Form 3 (n = 208).

This descriptive, exploratory study includes a phase of understanding the phenomenon through documentary research and an empirical-analytical phase with the target population from two private universities with high-quality accreditation that offer educational services to a predominantly a student population of strata 1, 2, and 3. The mixed-methods approach (quantitative and qualitative) is based on the collection and analysis of numerical data to answer the research question and achieve the proposed objectives. In the context of this project, the quantitative-qualitative design involves the use of surveys and objective measurements to collect data on the visual health and emotional well-being of young university students, as well as on the effectiveness of the proposed intervention.

All methods were carried out in accordance with the relevant institutional, national, and international guidelines and regulations governing research involving human participants.

All experimental protocols involving human participants were reviewed and approved by the Universidad cooperativa de Colombia bio-ethics subcommittee, in accordance with applicable ethical standards and regulations.

Informed consent was obtained from all participants prior to their inclusion in the study. Where applicable, informed consent was obtained from the participants' legal guardian(s).

3. Results

3.1 Form 1 (n = 312) Visual Symptoms. Frequency of optical examination, vision related headaches, and reported visual symptoms.

The Form 1 sample was primarily composed of women (59.6%; n = 186), followed by men (39.7%; n = 124) and non-binary individuals (0.6%; n = 2).

In the data shown in Table 1, 53.5% of participants had eye exams occasionally (once a year), 26.9% every two or three years, 12.5% never had them, and only 3.8% had frequent checkups every year and 3.2% every 6 months. This pattern demonstrates a marked deficit in the regular monitoring of eye health.

33% never experience visual headaches (n = 103), while the remaining 67% report experiencing them with some frequency: 31.7% sometimes (n = 99), 17.9% occasionally (n = 56), and 17.3% frequently or always (n =54).

83% of participants reported visual fatigue or eye strain after prolonged periods of studying or using screens (n = 259). Dry eyes were reported by 59.9% (n = 187), and neck, shoulder, or back pain by 56.1% (n = 175). These three symptoms constitute the predominant profile of visual discomfort in the studied population.

Table 1. *Frequency of optical examination, frequency of headaches, and reported visual symptoms among Form 1 participants (n = 312).*

Frequency of optical examination	n	%
Occasionally (once a year)	167	53.5%
Sometimes (every 2-3 years)	84	26.9 %
Never	39	12.5 %
Frequently (multiple times a year)	12	3.8 %

Frequency of optical examination	n	%
Always (multiple times every 6 months)	10	3.2 %
Frequency of headaches	**n**	**%**
Never	103	33 %
Sometimes (once every two weeks)	99	31.7 %
Occasionally (once a week)	56	17.9 %
Frequently (multiple times a week)	46	14.7 %
Always (every day)	8	2.6 %
Symptoms	**Yes(n)**	**%**
Eye strain or eye fatigue	259	83 %
Dry eyes	187	59.9 %
Neck, shoulder, or back pain	175	56.1 %
Total	**312**	**100.0 %**

Note. Form 1, UCC & UAO, 2026.

3.2 Form 2 (n = 222) Visual health and emotional well-being. Prevalence and frequency of visual symptoms, stress, anxiety and relationship with visual health, perception of university resources and emotional impact.

81.1% of participants reported experiencing visual symptoms such as blurred vision, eye strain, or headaches (n = 180): 42.8% reported 'some symptoms', 20.7% 'most', and 17.6% 'all'. 18.9% reported no symptoms. Regarding frequency, 43.7% experienced symptoms rarely, 27.9% several times a week, and 7.7% daily.

Stress and anxiety were common in the study population: 37.4% experienced them frequently (several times a week), and 8.6% always or almost every day. 38.3% sometimes perceived a relationship between their visual symptoms and their stress levels, and 5.9% always noticed it.

73.4% believe that improving their visual health would have a significant impact on their emotional well-being (n = 163). However, 32.9% are unaware of the existence of university resources in this area (n = 73), and 34.2% acknowledge their existence but consider the information insufficient (n = 76). Only 8.6% consider the resources sufficient and accessible (n = 19).

61.7% of participants have not sought professional advice on visual health despite experiencing discomfort (n = 137), highlighting a significant gap between the presence of symptoms and seeking specialized care. Table 2 presents the distribution of these variables.

Table 2. *Visual symptoms, stress and anxiety, relationship between stress and visual symptoms, and perception of university resources among Form 2 participants (n = 222).*

Visual symptoms experienced (such as blurred vision, eye strain, or headaches)	**n**	**%**	
None	42	18.9 %	
Some	95	42.8 %	
Most	46	20.7 %	
All	39	17.6 %	
Variable	**Category**	**n**	**%**
Stress/anxiety at university	Frequently (several times/week)	83	37.4%
Stress/anxiety at university	Occasionally (a few times/month)	83	37.4 %
Stress/anxiety at university	Rarely (1–2 times/semester)	31	14%
Stress/anxiety at university	Always (almost every day)	19	8.6 %
Stress/anxiety at university	Never	6	2.7 %

Relationship between stress and visual symptoms	Sometimes	85	38.3 %
Relationship between stress and visual symptoms	Rarely	75	33.8 %
Relationship between stress and visual symptoms	Never	49	22.1 %
Relationship between stress and visual symptoms	Always	13	5.9 %
Believes improving visual health will impact their well-being	Yes	163	73.4%
Believes improving visual health will impact their well-being	No	0	0 %
Believes improving visual health will impact their well-being	Not sure	51	23 %
Sought advice from an eye care professional	Yes	85	61.7
Sought advice from an eye care professional	No	137	38.3
Perception of resources or support provided by the university to address visual health and emotional well-being	**N**	**%**	
They exist, but information is scarce.	76	34.2%	
Has no knowledge of its existence	73	32.9%	
Not sure	29	13.1 %	
No, the resources are insufficient.	25	11.3 %	
Yes, they are sufficient and accessible.	19	8.6 %	
Total	**222**	**100.0 %**	

Note. Form 2, UCC & UAO, 2026.

3.3 Form 3 (n = 208) Comprehensive Triage of Well-being and Academic Success.

Academic-work profile, academic performance and achievement expectation,

sleep, stress and visual symptoms, coping strategies and use of institutional support, digital interference and intervention preferences.

Most participants combine their studies with their job: 53% full-time job (n = 111) and 18% part-time job (n = 38). Only 19% dedicate themselves exclusively to their studies (n = 39). 39 % spend between 10 and 20 hours per week on non-academic activities, and 27 % spend more than 30 hours.

56.7% report an outstanding university GPA (4.0–4.4; n = 91), 28.8% a good GPA (3.5–3.9; n = 45), and 7.7% an excellent GPA (≥ 4.5; n = 15) However, 36.5% performed slightly below expectations and 10.1% significantly below expectations, indicating a gap between expectations and actual achievements. Table 3 presents the performance data.

69.7 % sleep between 5 and 6 hours on days with academic activity (n = 145), and 21.6% sleep less than 5 hours (n = 45). The cognitive impact of poor sleep is rated as moderate (score 4–6) by 65.4% (n = 136) and severe (7–10) by 19.2 % (n = 40). Regarding stress, 43.8% experience it occasionally (n = 70) and 31.3% frequently during exam periods (n = 50). Visual symptoms after studying are frequent in 50 % (n = 104) and daily in 6.7% (n = 14). Faced with academic pressure, students' coping strategies are similarly distributed: 36.5% adopt passive strategies (stimulant use or isolation; n = 76), 34.1% active strategies (organization, sports, or social support; n = 71), and 29.3% avoidant strategies (procrastination; n = 61). 52.9% never use tutoring or institutional advising services (n = 110).

56% use their cell phones for social media or leisure for more than two hours daily in addition to study time (n = 117), which exacerbates their overall visual strain. Regarding preferences for institutional intervention, 43.8% prioritize mental health programs (anxiety, stress, and sleep management; n = 91), followed by 26.9% who prefer training in productivity and time management (n = 56). Table 3 shows the distribution of these preferences.

Table 3. *Academic-work profile, academic performance, sleep, coping strategies, and intervention preferences among Form 3 participants (n = 208).*

Variable	Category	n	%
Activity profile	Student and full-time worker	111	53 %
Activity profile	Full-time dedication to study	39	19 %
Activity profile	Student and part-time worker	38	18 %
Activity profile	Family care responsibilities	20	10 %
External time load	Between 10 and 20 hours/week	82	39 %
External time load	More than 30 hours/week	57	27 %
External time load	Less than 10 hours/week	45	22 %
External time load	Between 21 and 30 hours/week	24	12 %
Variable	**Category**	**n**	**%**
University average	Outstanding (4.0–4.4)	118	56.7 %
University average	Good (3.5–3.9)	60	28.8 %
University average	Excellent (4.5–5.0)	16	7.7 %
University average	Acceptable (3.0–3.4)	13	6.2 %
Achievement expectation	Equal to or greater than expected	111	53.4 %

Achievement expectation	Slightly lower (0.1–0.5)	76	36.5 %
Achievement expectation	Significantly lower (> 0.6)	21	10.1 %
Variable	**Category**	**n**	**%**
Sleep hygiene	Between 5 and 6 hours/night	145	69.7 %
Sleep hygiene	Less than 5 hours/night	45	21.6 %
Sleep hygiene	More than 7 hours/night	18	8.7 %
Cognitive impact (poor sleep)	Moderate (4–6 / 10)	136	65.4 %
Cognitive impact (poor sleep)	Severe (7–10 / 10)	40	19.2 %
Cognitive impact (poor sleep)	Low (1–3 / 10)	32	15.4 %
Visual symptoms after studying	Frequently (2–3 times/week)	104	50.0 %
Visual symptoms after studying	Never or almost never	90	43.3 %
Visual symptoms after studying	Always / Daily	14	6.7 %
Variable	**Category**	**n**	**%**
Coping strategy	Passive (stimulants/isolation)	76	36.5 %
Coping strategy	Active (organization/sport/support)	71	34.1 %
Coping strategy	Avoidant (procrastination)	61	29.3 %
Use of tutoring	Never	110	52.9 %
Use of tutoring	Once or twice per semester	67	32.2 %
Use of tutoring	Only before exams	15	7.2 %
Use of tutoring	Weekly	16	7.7 %
Improvement Plan / Intervention	n	**%**	

Time management and organization	91	43.8 %
Work-life balance	53	25.5 %
Technical study methods	35	16.8 %
Logical-mathematical skills	29	13.9 %
Mental health (anxiety, stress, sleep)	91	43.8 %
Productivity and time management	56	26.9 %
Visual health (ergonomics and fatigue)	31	14.9 %
Academic support (tutoring)	30	14.4 %
Total	**208**	**100%**

Note. Form 3, UCC & UAO, 2026.

Form 3 adds a relevant socioeconomic dimension: the majority of students combine their studies with full-time work (53.4%), which reduces the time available for self-care, adequate sleep, and the use of institutional resources. 52.9% never use tutoring services, and 69.7% sleep between 5 and 6 hours. This sleep insufficiency is associated with moderate to severe cognitive impairment in 84.6% of participants, negatively impacting performance and well-being.

The widespread perception that the university does not provide sufficient information or resources for eye health underscores an urgent institutional opportunity,

the design of coordinated preventive programs across student well-being, eye health, and academic support.

Discussion

The research results show a high frequency of visual symptoms associated with prolonged device use. This aligns with what was stated by Sheppard and Wolffsohn (1), those who maintain that, due to the substantial increase in digital devices in both professional and personal settings, digital eye strain (DES), also known as computer vision syndrome, affects more than 50% of computer users. The most common visual symptoms reported by the majority of participants in the sample are eye strain and dry eyes. According to León (2) these symptoms are due to prolonged visual concentration during study sessions in front of the screen. This causes a decrease in blinking and, therefore, a decrease in the proper lubrication of the cornea, leading to dry eyes; which is evidenced by redness, burning, irritation, and tearing. These claims are supported by our findings particularly in Form 1 (n = 312) 83 % of participants reported eye strain and 59.9% dry eyes after prolonged screen use, placing this sample well within the prevalence range Sheppard and Wolffsohn (1) describe. Specific symptoms such as eye fatigue, dry eyes, and neck or shoulder pain (56.1%) is precisely what León (2) predicts when decreased blinking. They found that eye strain has increased with the COVID-19 pandemic, accelerating from 5% to 65% in pre-pandemic studies to 80% to 94% during the pandemic. The authors mention that increased screen time and

sedentary behavior have led to other silent epidemics such as digital eye strain, myopia, musculoskeletal problems, obesity, and diabetes, among others (3).

According to Muthuprasad (4), During the pandemic, students reacted positively to online classes, preferring their flexibility, but also noting the technological challenges and academic delays they could cause. Connecting with what was proposed by Barrot (5). The biggest challenge for students is related to their home environment, and the smallest challenge is their technological competence, challenges that were aggravated by the pandemic in terms of quality of learning experience, mental health, financing, interaction and mobility. The post-pandemic persistence of these patterns is evident in our current study: 69.7 % of participants sleep only 5–6 hours on academic days and 21.6 % fewer than 5 hours, reflecting the sedentary, screen-heavy routines Kaur et al. (3) describe as accelerated by the pandemic. Furthermore, 53 % of participants combine full-time work with their studies, a structural constraint that compounds both screen exposure time and the home environment challenges Barrot (5) identifies.

| According to Ministerio de Salud (6) many eye disorders are preventable through healthy lifestyles, especially by controlling systemic diseases such as diabetes and hypertension. The ministry directly cites the WHO. “At least 2.2 billion people have impaired vision, either near or far. In at least 1 billion of these cases, the visual impairment could have been prevented or has not yet been treated.” (7) (para. 1). The data from Form 2 (n = 222) underscore this gap, 32.9 % of students are unaware that

visual health resources exist at their university and 34.2 % consider the available information insufficient.

According to Nagasundram (8) the use of smartphones can facilitate communication and access to academic resources. However, excessive use can impair social interactions and academic performance. This relates to what was stated by Wood (9), in the UK, it is estimated that 98% of teenagers own a smartphone, and 93% are active on social media, spending between one and a half and eight hours a day on it. Clearly, the more time spent on these screens, the more readily available access becomes worldwide, bringing both advantages and consequences. Goodyear (10) They mention that it is possible to consider restrictive policies within schools, but these have been found to have little influence on better smartphone use or on improving outcomes in the physical, cognitive, and mental domains of adolescents. This tension between use and harm is directly observable in Form 3 (n = 208): 56 % of participants use their phones for social media or leisure for more than two additional hours per day beyond study time, a pattern that Nagasundram (8) links to impaired academic performance and that Goodyear (10) suggests is resistant to top down institutional restriction alone.

In Colombia Ramírez (11) In the context of medical students, a high prevalence of Computer Vision Syndrome (CVS) was discovered among them. The results reached a similar conclusion, it is due to prolonged screen use or exposure during academic activities, which is associated with eye symptoms, particularly in the context of online

education. Additionally, they conclude that it is important to recommend that medical students take breaks from screens, increase the frequency of blinking, establish proper lighting and posture, and monitor their electronic device use with specific methods. Our study's findings from UCC and UAO students show significantly higher CVS reported compared to Ramírez's findings of 41.07 %; we have 83 % report eye strain, this could be related to the incremental use of digital means in academic, labor and entertainment environments or it's possible that the difference is due to any other factors such as the sample size or precedence; additional studies regarding the increment in percentage are needed. Additionally we found 67 % experience vision related headaches; symptoms directly attributable to prolonged academic screen exposure. The recommendation to take regular breaks and monitor device use is particularly urgent here, since only 7 % of participants have eye exams frequently and 12.5 % have never had one suggesting that the preventive practices Ramírez advocates are not yet routine in this population sample.

In other places, such as at Majmaah University, according to Almutairi (12) They conducted a similar investigation, examining the prevalence and interrelationships between screen time, visual disorders, and neck pain in university students, which revealed significant correlations between prolonged screen time and the presence of multiple symptoms, suggesting a synergistic effect of digital exposure on various body systems.

Considering the topic of mental health, the Ministerio de Salud (13) reported indicated that 66.3% of Colombians reported experiencing a mental health problem, with a figure of 69.9% among women, data that can be considered alarming. This is particularly true in the 18-24 age group, where 75.4% of women reported experiencing a mental health problem. Furthermore, 44.5% of the population identified the home as the place where mental health problems are most likely to arise, challenging the notion of the home as a safe haven from such issues. The Form 2 data (n = 222) situate this national picture at the institutional level, 37.4 % of participants experienced stress or anxiety frequently (several times a week) and 8.6% reported it almost every day. Notably, 38.3 % sometimes and 5.9% always perceived a direct relationship between their visual symptoms and their stress levels, and several participants described a somatization effect in which anxiety manifested as blurred vision or eyelid twitches during assessment periods a microcosm of the broader mental health burden the Ministerio de Salud reports for the same 18–24 age cohort.

We can consider that one of the causes of mental health problems is stress. Pascoe (14) They examined the impact of stress on high school and higher education students, identifying that academic factors that can generate stress interact in complex ways with digital habits. Another factor affecting mental health is sleep disruption, which can be caused by inappropriate screen use. Lanaj (15) investigated the consequences of late-night smartphone use on sleep and exhaustion at the start of the workday, demonstrating that smartphone use before bed is associated with less

quantity and quality of sleep, which in turn predicts less self-regulation and exhaustion the following day. Portocarrero and Rodrigues (16) They argue that mental health should be addressed from a comprehensive perspective that is not limited to prevention or treatment, but also includes strategies for protection and promotion of well-being. These dynamics are directly observable in Form 3: 69.7 % sleep only 5–6 hours and 21.6 % fewer than 5 hours on academic days, with 84% rating the cognitive impact of poor sleep as moderate to severe. Consistent with Pascoe's findings, 43.8% experience academic stress occasionally and 31.3% frequently during exam periods, and 50 % report visual symptoms after studying two to three times a week.

Alshobaili and AlYousefi (17) They specifically examined the effect of smartphone use at bedtime on sleep quality in non-medical staff at King Saud University. The results confirmed a significant inverse relationship between smartphone use before bed and reported sleep quality, with particular effects on sleep latency, sleep efficiency, and daytime sleepiness. This relationship is plausible in our current sample: 56% of Form 3 participants use their phones for social media or leisure for over two additional hours per day beyond study time.

Zhang (18) They conducted a study controlling for demographics, exercise, and lifestyle factors to examine the association between screen time and anxiety and depression in university students. The results revealed a significant positive association between prolonged screen time and elevated levels of anxiety and depression, even after controlling for confounding variables.

The results of a survey indicate that 62% of participants stated that their study time is interrupted by their mobile device; the constant checking of notifications is affecting their attention span, causing delays in completing tasks and impacting the quality of their work (19).

Rivas (20) It revisits Blehm's arguments and mentions that eye strain, also known as computer vision syndrome, is one of the consequences associated with prolonged screen use; reduced blinking, poor posture, and the light emitted by screens generate symptoms such as blurred vision, headaches, eye fatigue, irritation, redness, dryness, and neck pain, in addition to other effects on visual health. Each element of Rivas's symptom list is confirmed in our data: eye fatigue (83 %), dry eyes and irritation (59.9%), headaches related to vision (67 %), and neck or shoulder pain (56.1 %) in Form 1. Form 3 adds that visual symptoms after studying occur frequently or daily in 57% of participants.

The Social Determinants of Health Model of Whitehead and Dahlgren (21) This can be especially relevant, as it highlights the importance of addressing the social, economic, and environmental factors that influence health. Furthermore, the Ecological Model of Bronfenbrenner (22) offers a comprehensive perspective by considering the influence of micro and macro environments on the visual and emotional health of university students. Academic stress is a relevant factor in the visual and emotional health of university students.

According to Lazarus and Folkman (23), Stress occurs when a person perceives that external demands exceed their resources to cope. According to Maroco (24) In the university context, high academic demands and fear of failure can generate chronic stress that negatively affects students' visual and emotional health. Furthermore, Lanaj, Johnson, and Barnes (15), academic stress can be associated with the excessive use of electronic devices, as these are used for both academic and entertainment activities, increasing the risk of eye strain and emotional disorders. The present data substantiate this chain of effects. Form 2 documents that 37.4% of participants experience stress or anxiety frequently and another 8.6% almost every day. Form 3 shows that coping strategies skew toward passive (36.5%) and avoidant (29.3%) approaches rather than active ones (34.1%) consistent with the resource-depletion dynamic Maroco associates with chronic academic stress and the device over-reliance Lanaj, Johnson, and Barnes link to visual and emotional risk.

Lem (25) Returning to Seddon's ideas, they point out that consuming a diet rich in antioxidants, such as carotenoids, may be related to better eye health. According to Reed and Buck (26) Regular physical activity has been shown to have positive effects on emotional health by reducing levels of anxiety and depression. Therefore, preventive interventions should include strategies to promote healthy eating and regular physical exercise. It is also important to consider the impact of interpersonal relationships on the well-being of young university students.

Limitations

Future research should move from the descriptive characterization of visual and emotional health risks toward the design and evaluation of a comprehensive preventive intervention. Based on the needs identified in this study, a mobile or digital intervention could integrate educational content on healthy screen use, visual ergonomics, active breaks, sleep hygiene, time management, and strategies for emotional well-being.

Subsequent studies should evaluate the feasibility, acceptability, adherence, and effectiveness of the intervention using measurable outcomes, including changes in visual symptoms, sleep duration, perceived stress, digital-device habits, and use of institutional support. Intervention studies should also establish the appropriate frequency and duration of preventive activities and assess implementation costs and cost-effectiveness. Longitudinal or controlled designs would allow researchers to determine whether improvements in these outcomes are sustained over time.

Conclusions

The results from the three questionnaires reveal a visual and academic risk profile consistent with that reported in the international literature. The high prevalence of eye strain (83%), dry eyes (59.9%), and visual headaches (67% with some frequency). The finding that 73.4% perceive that improving their visual health would positively impact their emotional well-being reinforces the relevance of integrated interventions.

This research aimed to investigate risk and protective factors related to visual and emotional health in university students. The findings of the research allow us to conclude that university students are being affected in both their visual and emotional health due to excessive screen use, and despite understanding that they are experiencing symptoms, many do not know how to cope with this situation. The results show that students are unaware of the existence of university resources in this area; others recognize that they exist but consider the information insufficient. And the majority of participants have not sought professional advice on visual health despite experiencing discomfort.

This reveals that despite the presence of symptoms, there is no real search for specialized care. Furthermore, the results of the questionnaires reveal a visual and academic risk profile consistent with what has been reported in the international literature. These results reveal the high prevalence of eye strain, dry eyes, and visual headaches (with some frequency). The study identifies that excessive daily screen exposure, with limited use of breaks and a lack of awareness of preventive measures, constitutes a critical risk factor. In terms of mental health, it was evident that visual symptoms affect students, generating stress and anxiety. Another trigger, in addition to visual symptoms, is the lack of restorative sleep, which leads to poor concentration and emotional problems. The data obtained indicate that the above demonstrates that improving visual health in students positively impacts their emotional well-being and reinforces the relevance of integrated interventions.

Finally, these results allow the research to continue in the future, with a line of design and development for a comprehensive program to promote health and emotional well-being among university students, using information and communication technologies as a key tool. This includes offering educational content in academic settings on the proper use of screens, promoting active breaks and time and resource management, and increasing support for mental health processes, academic tutoring, and study techniques.

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