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"INFLUENCE OF COMPUTER VISION SYNDROME ON MUSCULOSKELETAL AND STRESS RELATED PROBLEMS AMONG MEDICAL STUDENTS"

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Article Info

Abstract

Introduction: Medical students are increasingly using computers and other visual display terminals (VDT) screens, which raises several health risks. There is, however, a dearth of information regarding the frequency of Computer Vision Syndrome in relation to musculoskeletal and stress-related issues in medical students.

Objectives: The purpose of this study is to determine the prevalence of CVS among medical students, as well as how the increased use of VDT devices has affected their comprehension of and adherence to preventive measures

Methods: A cross-sectional descriptive study involving 145 medical students from UMDC, UCPT, and UCNM in Karachi, Pakistan, was conducted utilizing the Computer Vision Syndrome Questionnaire, the Nordic-styled Questionnaire, and a stress questionnaire. The Statistical Package for Social Sciences (SPSS15) was used to examine the data. To investigate the significance of associations, the chi-square test was used to get a significant result with the p-value <0.05 determined to be statistically significant.

Result: A total of 145 participants participated in the study; 105 were females, 35 were males and 5 were inactive or missing; the age ranged between 19 and 26 years, with a mean of 22.8 years. The prevalence of CVS was 75.9%. A moderate level of work-related stress was experienced by 64.8% of the participants in the study. The typical daily usage of a handheld computer is four hours, while two hours are spent using a computer at home. The most frequently reported visual symptoms of CVS were headache (61.4%), eye strain (55.9%), back discomfort (64.1%), and neck and shoulder pain (51.7%). More than 8 hours of computer use every day OR closer viewing OR the absence of protective goggles OR, the use of eyedrops OR, and the use of anti-glare screens OR were all substantially linked with CVS. The impact of stress on musculoskeletal symptoms and visual symptoms of CVS were not statistically significantly correlated.

Conclusion: CVS was significantly associated with not taking preventative measures, working overtime, and having an inappropriate viewing distance. Spending more hours per day in front of a VDT DEVICES. However, there is no correlation between CVS and mucus and stress-related conditions.

Keywords:

Computer Vision syndrome, Digital eye strain, Stress. Musculoskeletal Problems, Medical Students.

Introduction

The term "computer vision syndrome," sometimes known as "digital eye strain," refers to a variety of vision- and eye-related issues brought on by extended computer, tablet, e-reader, and mobile phone use (Torvela, 2022). Using a computer often causes people to blink less than reading material on paper. Dry eyes may result from this, and it may also contribute to digital eye strain (Kaur et al., 2022). These symptoms may also be associated with digital eye strain, according to some healthcare professionals (Zayed et al., 2021, Newton & Poluan, 2022). Take periodic pauses, observe the 20-20-20 principle. Your eyes can relax and regain focus with the 20-20-20 rule. Every 20 minutes, focus for 20 seconds on anything that is 20 feet away. Take a 15-minute break, give your eyes a 15-minute break after using a screen nonstop for two hours, concentrate on things that are nearby and far away from the computer as you step away from it, and perform activities away from a screen. Avoid glancing at another computing device while taking breaks. Try engaging in non-screen activities like paperwork organization or going for a stroll (Johnson & Rosenfield, 2023). The length of the job and a lack of ergonomic training for employees to follow safe workplace practices have contributed to a rise in CVS prevalence. Because CVS puts an unusual amount of strain on workers' physical health, it lowers visual function and quality of life, reduces employees' effectiveness, can increase the number of mistakes made while performing computer tasks, and may also require more frequent breaks, all of which lead to a significant loss in productivity (Madheswaran et al., 2025).

Blue light, which is emitted by electronic devices like laptops and smartphones, could cause problems with our sleep cycles. This can eventually lead us to sleep less soundly, which can contribute to increased stress levels. In a work environment, it might increase the stress from external variables like deadlines or team expectations (Randjelović et al., 2023).

Computer screen light may disturb biological circadian rhythms, resulting in digital eyestrain and insomnia. Seizures can also be caused by stress. Migraine is also an indicator of the occurrence of chronic migraine from intermittent migraine (Malik & Javed, 2021). Stressful situations in life could trigger insomnia. Taking breaks when using a computer is an important preventative measure, as well as adjusting screen brightness, using screen filters, and practicing good ergonomics (Cheng et al., 2019). Souheil Hallit, a senior investigator of the study, also suggested these measures to help prevent the syndrome (Parihar et al., 2016).

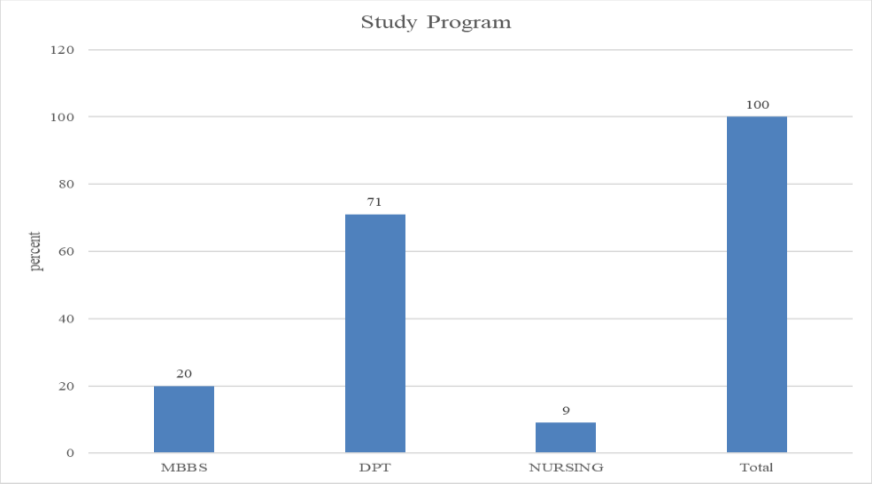
MATERIAL AND METHODS:

This study was carried out among undergraduate medical students from United Medical and Dental College (UMDC), United College of Physical Therapy (UCPT), and United College of Nursing and Midwifery (UCNM). The research, which followed a cross-sectional design, took place over a period of one year from January 2024 to October 2024 after receiving ethical approval. A total of 145 participants were selected using a non-probability convenience sampling technique. The sample size was calculated with the Raosoft software, based on a similar study by Amar Das et al. (2022). Participants included both male and female undergraduate students from MBBS, DPT, and Nursing programs who voluntarily agreed to take part, while students from non-medical programs or those with congenital conditions were excluded.

Data collection was performed through standardized, validated questionnaires adapted from previous studies. These included a Nordic-style questionnaire for musculoskeletal symptoms, the CVS-Q for computer vision syndrome, and a stress questionnaire from Eun-Jin Lee's 2018 research. Participants were given questionnaires after providing informed consent, and completed forms were collected for analysis. The data was processed using SPSS version 15.0, with results evaluated through an independent T-test. The study had all ethical standards were followed, including ensuring data confidentiality and anonymity of participants.

RESULTS:

A study involved 145 participants from different years of UMDC, UCNM, and NURSING, in which 8.3% were 1st-year students, 29.0% were from 2nd year, 21.4% were 3rd-year students, 16.6% from 4th year and 24.8% 5th-year students. Out of 145, 20% of them were doing MBBS, 9% were doing NURSING and the rest of the 71% were doing DPT.



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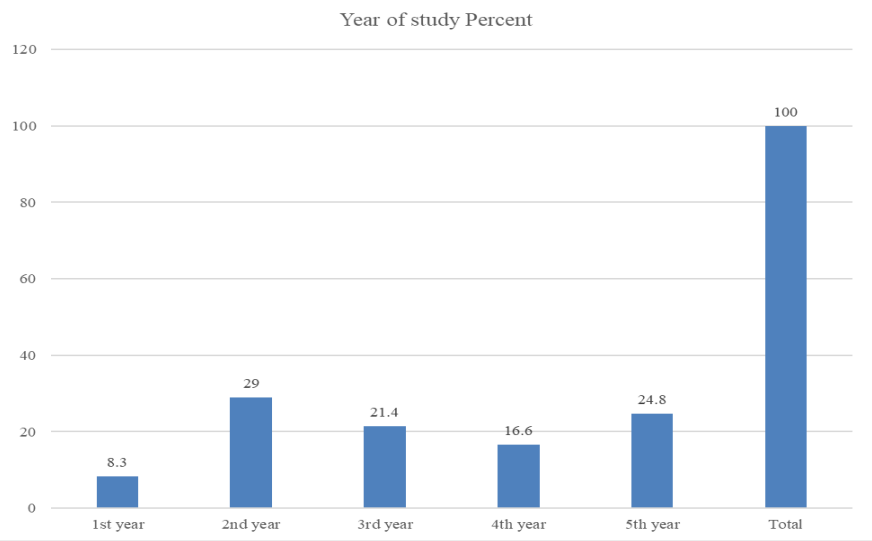
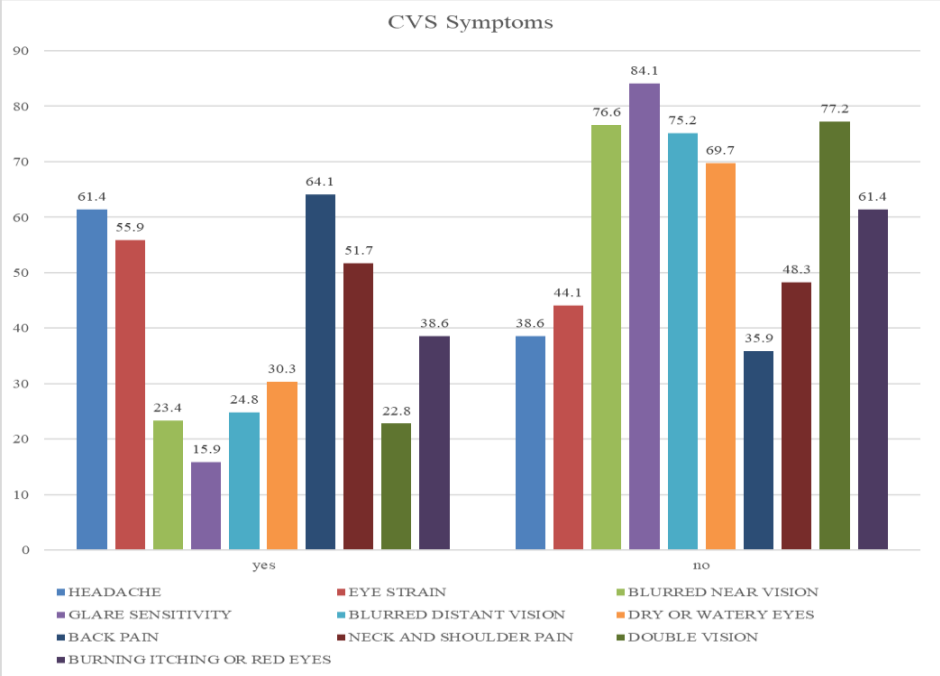


Figure no 4.

In figure 3, among 145 participants, it is indicated how many individuals had CVS symptoms. 61.4 % were having headaches, 55.9% were having eye strain, 23.4% had blurred near vision, 15.9% had glare sensitivity, 24.8% had blurred distant vision, 30.3% had dry or watery eyes, 64.1%having back pain, 51.7% were having neck and shoulder pain, 22.8% having double vision and 38.6% participants were having burning itching or red eyes. Out of which 38.6% headache, 44.1% eye strain, 76.6% blurred near vision, 84.1% glare sensitivity, 75.2% blurred distant vision, 69.7 dry or watery eyes, 35.9% back pain, 48.3% neck and shoulder pain, 77.2% double vision, 61.4% burning itching or red eyes symptoms were not found



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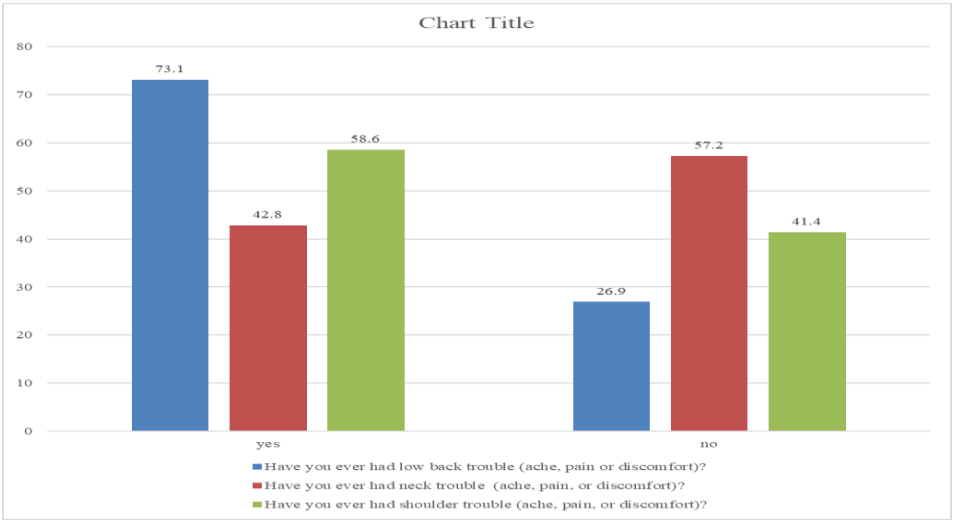
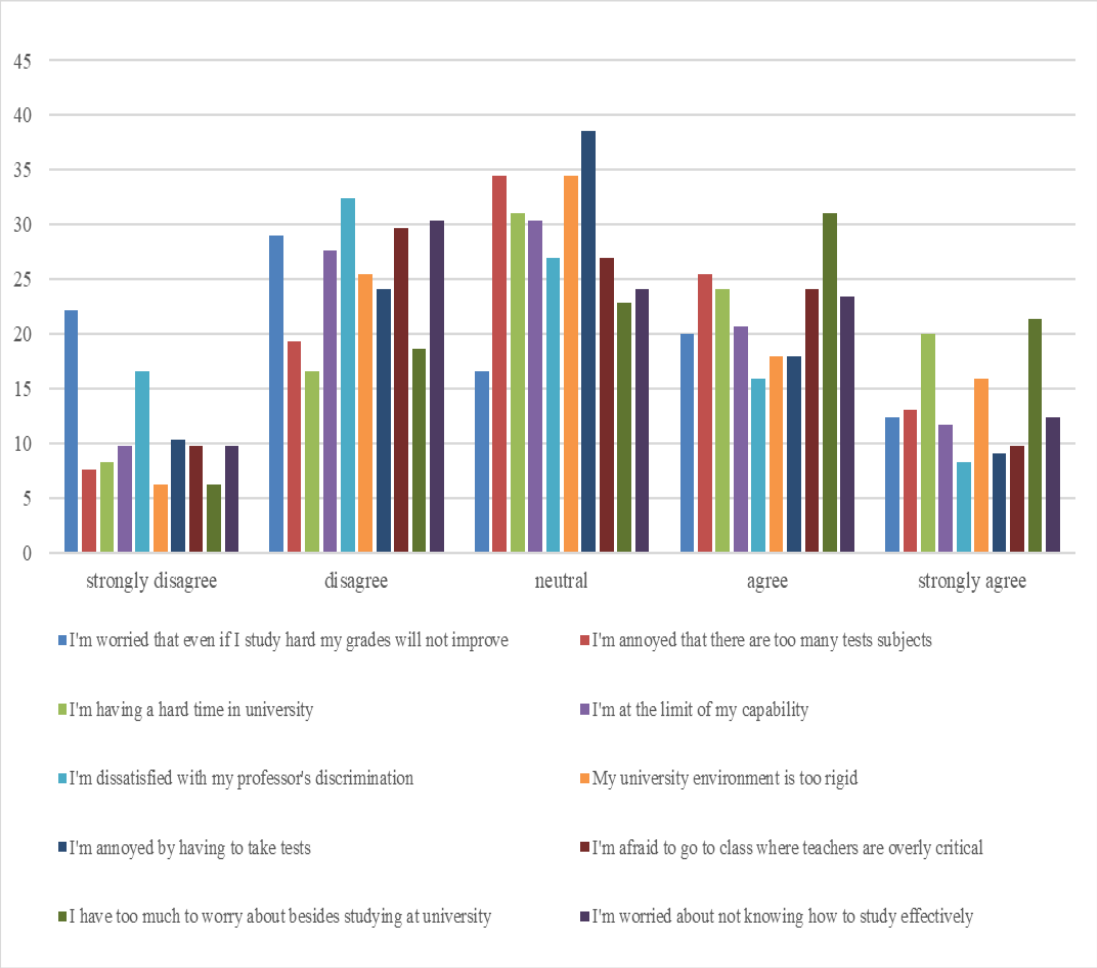


Figure no 6.

In figure 18, 145 participants were included in our study, 22.1% strongly disagreed, 29% disagreed, 16.6% were neutral, 20% agreed, and 12.4 were strongly agreed that they're worried that their grades will not improve even after studying. 7.6% strongly disagreed, 19.3% disagreed, 34.5% neutral, 25.5% were agreed and 13.1 were strongly agreed because of too many test subjects. Participants who agreed having a difficult time in university were 24.1%, who disagreed were 16.6%, strongly agreed were 11.7%, strongly disagreed were 8.3%, and around 31% were neutral. 9.7% strongly disagreed, 27.6% disagreed, 30.3% were neutral, 20.7% agreed, and 11.7% were strongly agreed that they were at their limit of capabilities. . Participants who agreed with professor's discrimination were 15.9%, who disagreed were 32.4%, strongly agreed were 8.3%, strongly disagreed were 16.6%, and around 26.9% were neutral. 6.2% strongly disagreed, 25.5% disagreed, 34.5% neutral, 17.9% were agreed and 15.9 were strongly agreed because of university's rigid environment. 38.6% were neutral, 24.1% disagreed, 17.9% agreed, 10.3% strongly disagreed, and 9% strongly agreed that they get annoyed by having tests. Around 29.7% disagreed that theyre afraid of overly critical teachers, 24.1% agreed, 26.9% were neutral, and 9.7% were strongly agreed and strongly disagreed. 31% agreed, 18.6% disagreed, 22.8% were neutral, 6.2% strongly disagreed, and 21.4% strongly agreed on worrying besides studying at university. Participants who disagreed that they were worried not studying effectively were around 30.3%, who agreed were 23.4%, 24.1% were neutral, 9.7% were strongly disagreed while 12.4% strongly agreed.



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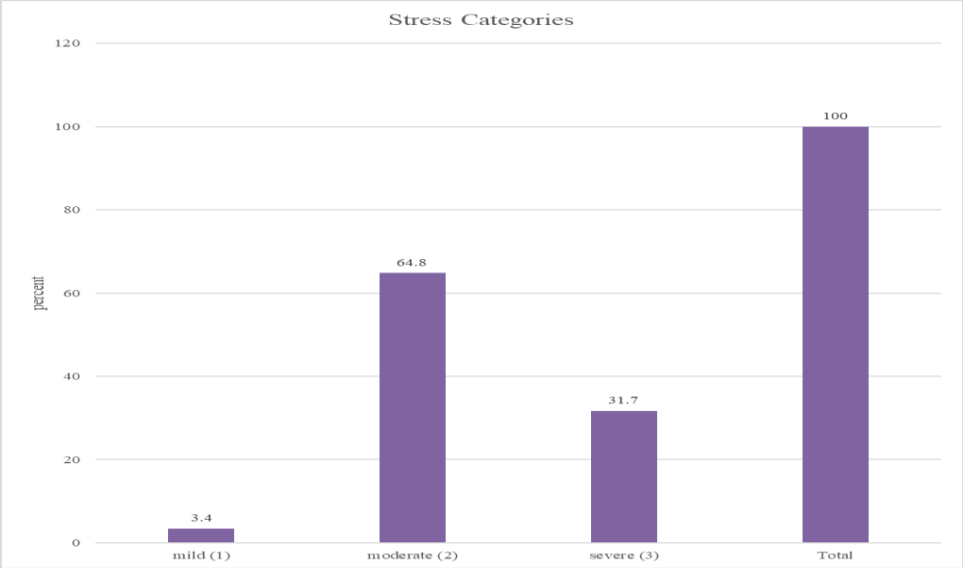

Figure no 8.

DISCUSSIONS:

Our study revealed that the use of anti-glare screens, eye drops, and protective goggles, as were closer viewing and computer use lasting longer than 8 hours per day were all found to be highly related to CVS. The prevalence of CVS was determined to be 75.9%. Headaches, back discomfort, neck and shoulder pain, and eye strain were most frequently reported among participants and significantly associated with CVS. Other than the fact that no other significant MSK-related issues were discovered, students reported musculoskeletal complaints like lower back pain (73.1%), shoulder pain (42.8%), and neck pain (58.6%), whereas moderate stress-related disorders were experienced by 64.8% of the participants, primarily as a result of the workload of university and studies.

In our research, out of a total of 145 participants, 75.9% (140) reported to have CVS. Compared to previous studies that found a prevalence of 74.0% of medical students in Nepal (Basnet, 2018) , with a quite increased prevalence 97%-95.5 % of students studying in health sciences and other medical students in Saudi Arabia (Abudawood & Ghufran, 2020), 64%- 90% of undergraduate dentistry students[23], 74.32% of MBBS students in china up to 73.9% among of secretariats and data processor, 68.8% of secretaries in Addis Ababa, Ethiopia (Dessie et al., 2018), high prevalence was also found among students at private universities in Paraguay (Coronel-Ocampos et al., 2022) and Saudi University students with CVS (AlDarrab et al., 2022).

However, according to one of the previous studies, a majority of the children reported having never experienced any of the common ocular symptoms like redness, watery eyes, scratchy eyes, headache, sore eyes, or difficulty refocusing prior to the increased screen exposure. The development of CVS symptoms in children and the increase in activity levels were significantly correlated. The range of symptoms experienced by the children varied, with some children experiencing a single symptom while others had up to five different symptoms. This provides valuable information about the types of symptoms children are experiencing, which can be useful for clinicians and educators (Wadhwani et al., 2022).

However, the main symptoms of CVS in children included a headache, tears, itching, blurred vision, eye redness, eye pain, and dryness. Children's views about their health during the COVID-19 pandemic and the prevalence of CVS are highly connected. According to Adrian Bartoszek et al., the study raises concerns about the potential long-term impact of CVS on students' visual health and overall well-being. Future research and interventions should focus on mitigating the effects of CVS and promoting healthier digital habits, particularly in educational institutions where online learning is expected to remain a significant part of the curriculum (Abuallut et al., 2022).

As compared to Elly Liyana Zainodine et al. research which discovered that good posture and suitable workstation design are essential for computer vision syndrome prevention strategies in order to increase office workers' work productivity and quality of life. The most common complaint reported by office workers was shoulder discomfort followed by neck pain and headache (Zainodin, 2020) Neck pain and shoulder pain were strongly correlated with using a laptop on the thigh. When looking at computer screens more closely than 30 inches away, headaches were observed to be significantly more common. Back pain and headaches were also often reported (78% and 70%, respectively) in a different research by Alaa N Turkistani et al. although neck/shoulder discomfort was found to be the most prevalent extra ocular symptom (Turkistani, 2021).

In our research, moderate stress-related disorders were experienced by 64.8% of the participants, primarily as a result of the workload of university, and studies as compared to earlier studies found a significant correlation between increased sleepiness and CVS as well as a significant correlation between migraine probability and both CVS and stress levels. Stress acted as the primary mediator in the majority of the relationships between CVS and migraines and the majority of the relationships between CVS and insomnia (Akiki, 2022). After adjusting for covariates (age, body mass index, and house crowding index), Georges Merhy et al. discovered that among Lebanese male adolescents with CVS, those with CVS had significantly higher mean scores for depression, anxiety, and insomnia compared to those without CVS. Despite not being associated with aggression, CVS was much more likely to result in melancholy, anxiety, and insomnia. Stress acted as a mediator in the relationships between CVS and depression, anxiety, restlessness, and aggression. In another previous study, the majority of medical students with CVS experienced less restful sleep than those without CVS (Merhy & A.M., 2023).

Other ergonomic methods that were less frequently utilized included pausing while using the device, sitting with the screen at face level, sitting with the top of the screen at eye level (sitting with the screen more than 50 cm away), and wearing an antiglare filter. More ocular problems were reported by female students than male ones. Participants had astigmatism, hyperopia, and myopia in terms of refractive defects. Students who need their vision corrected while studying wear glasses and contact lenses. Working more hours, not taking preventative steps, and using the wrong viewing distance all significantly increased the risk of CVS. [20] Work-related stress and musculoskeletal issues were also discovered to be significant correlates with longer hours per day spent in front of a Visual Display Terminal screen. Less than 2 hours to less than 6 hours per day of exposure to digital gadgets was used to categorize the kids. The development of CVS symptoms in children and the rise in activity levels were significantly correlated. However, computer users with common secretarial and officer positions who received high income often took breaks

for their health had a good understanding of computer security procedures were less affected by CVS (AlDarrab et al., 2022).

CONCLUSION:

In conclusion, our research aimed to investigate the prevalence and potential risk factors associated with Computer Vision Syndrome (CVS) among medical university students. Our findings revealed a high prevalence of CVS (75.9%) among the participants. Despite numerous prior studies in this field, we encountered challenges in establishing a direct correlation with the existing body of research. Several reasons can be attributed to this disparity.

Firstly, the variation in the studies across different studies may be due to diverse methodologies, demographics, and sample sizes. This discrepancy can make it challenging to draw definitive conclusions and establish a uniform correlation. Our research encompassed a specific demographic of medical university students, whereas other studies may have focused on a broader range of participants, including students from different fields and age groups.

Secondly, the potential influence of technological advancements and changes in lifestyle cannot be discounted. With the rapid evolution of digital devices and the proliferation of online learning, the circumstances surrounding computer use have drastically changed over the years. This could lead to variations in the prevalence of CVS and its associated risk factors.

Furthermore, the statistical significance of our findings, reflected by the p-values, plays a pivotal role in understanding the credibility of our results. While our research identified several risk factors that were statistically significant, it is possible that some previous studies may not have reached the same level of statistical significance due to differences in sample sizes or methodologies.

In summary, despite the observed disparity in correlation with prior research, our study underscores the pressing issue of CVS among medical university students and the need for tailored preventative measures. The high prevalence of CVS among this demographic, influenced by factors such as extended computer usage, closer screen viewing, and a lack of protective measures, highlights the importance of raising awareness and implementing strategies to mitigate the impact of CVS.

Our findings, combined with the broader body of research, emphasize the necessity for customized interventions, ergonomic adjustments, and education regarding CVS to enhance the visual health and overall well-being of individuals, particularly in the context of increased digital device usage. As technology continues to advance, addressing the challenges associated with CVS remains a critical endeavor for both educators and healthcare professionals.

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