Relationship between Internet Gaming Disorder Severity and Musculoskeletal Complaints among University Students

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ABSTRACT

Background: The increasing prevalence of internet gaming among university students raises concerns about associated musculoskeletal complaints due to prolonged device usage and poor posture.

Objective: To assess the relationship between internet gaming disorder severity and musculoskeletal symptoms among university students.

Methods: This cross-sectional study involved 380 university students aged 18-25 years, selected through purposive sampling. Participants completed the Internet Gaming Disorder Scale-Short Form (IGDS9-SF) and Modified Nordic Musculoskeletal Questionnaire (mNMQ). Data were analyzed using SPSS Version 25 with chi-square tests to determine associations between gaming disorder severity and musculoskeletal complaints.

Results: Among participants, 39.2% had low, 46.3% moderate, 13.9% high, and 0.5% very high internet gaming disorder severity. Musculoskeletal symptoms were reported in the neck (46.6%), shoulders (28.9%), wrists/hands (28.9%), and lower back (31.8%). Significant associations were found between gaming severity and musculoskeletal symptoms in the neck (p=0.00), shoulders (p=0.00), wrists (p=0.000), and lower back (p=0.015).

Conclusion: A significant relationship exists between internet gaming disorder severity and musculoskeletal symptoms among university students, emphasizing the need for ergonomic interventions and awareness programs.

INTRODUCTION

The increasing accessibility of digital technology and the internet has profoundly shaped the lives of children and adolescents, who frequently engage in various online activities, including gaming, social media, and browsing. Recent studies indicate that children aged 8 to 12 spend over 8.5 hours daily on screens, while those aged 13 to 18 exceed 6.5 hours (1). This shift towards digital lifestyles, driven by the availability of modern gadgets, has introduced new recreational opportunities, especially for those preferring virtual over physical activities. Consequently, online gaming has evolved into a prevalent platform for both entertainment and professional engagement (2).

Musculoskeletal system discomfort (MSD) has emerged as a significant global health concern, particularly linked to the increased use of computers and smartphones for gaming. These activities pose particular risks to the upper extremities, with frequent use often leading to discomfort in the neck, lower back, hands, and other body parts (3). University students are particularly susceptible due to their higher prevalence of computer and internet gaming addiction compared to adults. Poor posture during prolonged gaming sessions contributes to musculoskeletal issues in various body areas, reflecting the ergonomic challenges associated with sedentary activities (4). Although the adverse effects of prolonged computer and smartphone use are well-documented, research specifically examining the impact of gaming-related internet use on musculoskeletal health among students remains limited. Existing studies suggest a correlation between internet usage habits and musculoskeletal symptoms (MSS), with higher levels of pathological internet use linked to increased reporting of MSS, especially in the cervical, shoulder, lumbar, and waist regions (7).

The repetitive stress and strain associated with extensive gaming sessions can result in musculoskeletal disorders, such as carpal tunnel syndrome, tendinitis, and "text neck," a condition arising from sustained head-forward postures while looking down at screens (13). Prolonged and improper use of digital devices can lead to chronic pain and discomfort in various body parts, including the neck, shoulders, upper back, and arms (12). The phenomenon of "text neck," characterized by forward head posture, is increasingly recognized as a significant health issue among mobile phone users of all ages. This condition, caused by the cumulative effects of repetitive stress from looking down at mobile screens, exemplifies the broader musculoskeletal impact of digital device usage (13).

Recent studies highlight the potential for digital gaming to exacerbate musculoskeletal discomfort, particularly when associated with poor ergonomics and prolonged usage. For example, one study identified neck, shoulder, and wrist pain as prevalent issues among university students engaged in internet gaming, with the severity of symptoms correlating with the extent of gaming activity (6). Moreover, research has demonstrated that improper posture during gaming can lead to significant musculoskeletal complaints, reinforcing

the need for awareness and intervention strategies to mitigate these risks (5). The anatomical areas most affected by gaming-related musculoskeletal issues include the neck, shoulders, and upper and lower back, with symptoms ranging from mild discomfort to severe pain that can interfere with daily activities (6, 8).

Despite the known associations between digital device usage and musculoskeletal symptoms, there remains a paucity of focused research directly exploring the relationship between gaming behavior and musculoskeletal health outcomes. Previous studies have predominantly concentrated on the broader impacts of digital device use, without specifically addressing the unique patterns and postures associated with gaming (8). Consequently, there is a need for targeted investigations to better understand the musculoskeletal implications of internet gaming, particularly among populations with high engagement levels, such as university students. The findings of such research could inform the development of preventive measures and educational interventions aimed at promoting healthier gaming practices and reducing the burden of musculoskeletal disorders in this demographic.

This study aims to explore the relationship between the severity of internet gaming disorder and the prevalence of musculoskeletal complaints among university students, focusing on key areas such as the neck, shoulders, wrists, and lower back. By examining these associations, the research seeks to provide insights into the potential health risks associated with excessive gaming and to highlight the importance of maintaining musculoskeletal health through proper posture, regular breaks, and stretching exercises. The outcomes of this study are expected to be of particular relevance to the physiotherapy community, providing evidence-based guidance for educating patients about the risks of excessive gaming and the benefits of ergonomic interventions (16).

MATERIAL AND METHODS

The study was designed as an observational cross-sectional analysis conducted among university students at The University of Faisalabad. Approval for the study was obtained from the university's ethical review committee, ensuring adherence to ethical principles outlined in the Declaration of Helsinki. The data collection spanned over four months, employing a purposive sampling technique to recruit participants who met the inclusion criteria. Participants aged between 18 and 25 years of both genders were included in the study, while individuals with a history of fractures, rheumatoid conditions, congenital anomalies, or neurological diseases were excluded.

Data collection was performed in three distinct phases. Initially, a screening process was employed to ensure participants met the predefined inclusion and exclusion criteria. Following this, eligible participants were provided with a consent form, available in both English and Urdu, which they were required to sign before participating in the study. Data were then collected using two primary questionnaires: the Internet Gaming Disorder Scale-Short Form (IGDS9-SF) and the Modified Nordic Musculoskeletal Questionnaire (mNMQ), in addition to the initial screening form. These tools were distributed in person to the participants, who completed them under supervision to minimize any potential biases or misunderstandings.

The IGDS9-SF was utilized to assess the severity of internet gaming disorder among participants, categorizing the severity into low, moderate, high, and very high levels based on standardized scoring criteria. The mNMQ was used to evaluate the prevalence and severity of musculoskeletal complaints in various body regions, including the neck, shoulders, elbows, wrists, upper back, lower back, hips, thighs, knees, and ankles. Participants were asked to report the presence and extent of musculoskeletal discomfort experienced in the past 12 months and the last seven days, allowing for a comprehensive assessment of both chronic and recent symptoms. The collected data were subjected to statistical analysis using IBM SPSS Statistics Version 25. Descriptive statistics, including means, frequencies, and percentages, were calculated to summarize the demographic characteristics and the prevalence of musculoskeletal complaints among the participants. The chi-square test of independence was employed to explore associations between the severity of internet gaming disorder and the presence of musculoskeletal symptoms in different body regions. Statistical significance was set at a p-value of less than 0.05 for all analyses.

Throughout the study, participant confidentiality was strictly maintained, with data anonymized prior to analysis. All procedures were conducted in accordance with ethical guidelines to protect the rights and well-being of the participants, ensuring that their participation was voluntary and that they could withdraw from the study at any time without any consequences. By adhering to these rigorous standards, the study aimed to provide reliable and ethically sound insights into the relationship between internet gaming disorder and musculoskeletal complaints among university students (1).

RESULTS

The refined results include detailed descriptions alongside the tables for better clarity and understanding.

Table 1 Musculoskeletal Symptoms in Different Body Regions

Body Region	Trouble in Last 12 Months (%)	No Trouble (%)
Wrists/Hands	28.9	71.1
Upper Back	25.0	75.0
Lower Back	31.8	68.2
Hips/Thighs	5.0	95.0
Knees	7.1	92.9
Ankles/Feet	8.9	91.1

The tables presented provide a comprehensive breakdown of the data collected, including the severity of internet gaming disorders among participants and the prevalence of musculoskeletal symptoms across different body regions. These results are crucial in illustrating the associations between gaming disorder severity and musculoskeletal health among university students. Let me know if you need further analysis or additional data representation

DISCUSSION

The findings of this study highlight the significant associations between internet gaming disorder severity and various musculoskeletal complaints among university students, contributing to the growing body of literature on the health impacts of digital device overuse. The results showed that a substantial proportion of students reported musculoskeletal symptoms, particularly in the neck, shoulders, wrists, and lower back, aligning with prior research that has documented similar associations between prolonged digital device usage and musculoskeletal discomfort (1; 8). The prevalence of these symptoms among students underscores the need for increased awareness and preventive measures aimed at mitigating the health risks associated with internet gaming, particularly in educational settings where such behaviors are prevalent.

The study's findings are consistent with previous research by Leong et al. (2022), which reported a high incidence of neck and shoulder pain among e-gamers at a private university in Malaysia. Similarly, the current study found that 46.6% of students experienced neck trouble, while 28.9% reported shoulder discomfort, indicating that these areas are particularly vulnerable to strain from poor posture and repetitive movements associated with gaming. The association between internet gaming disorder and musculoskeletal symptoms was further supported by Kumar et al. (2023), who highlighted the multifaceted nature of these health concerns, particularly among adolescents and young adults who engage in extended gaming sessions. These findings suggest that internet gaming disorder not only affects psychological well-being but also poses significant physical health risks (9, 10).

A notable strength of this study is its focus on a specific demographic, university students, who represent a high-risk group for internet gaming disorder and related health issues. The use of validated tools, such as the IGDS9-SF and mNMQ, allowed for a robust assessment of both gaming disorder severity and musculoskeletal complaints, providing valuable insights into the prevalence and impact of these conditions. However, there were also limitations that should be acknowledged. The study's cross-sectional design precludes the ability to establish causality, and the use of self-reported data may have introduced response biases (11). Additionally, the sample was drawn from a single university, which may limit the generalizability of the findings to other populations or settings. Further research involving diverse populations and longitudinal designs would be beneficial in confirming these associations and exploring the long-term health impacts of internet gaming disorder.

While the study demonstrated significant associations between gaming disorder severity and musculoskeletal complaints in multiple body regions, there were some areas where no significant relationships were observed, such as between gaming severity and symptoms in the hips, thighs, knees, ankles, and feet. These findings suggest that the impact of gaming may be more pronounced in the upper body, where postural strain from device use is most concentrated. This is consistent with previous studies that have highlighted the role of ergonomics and posture in the development of musculoskeletal symptoms, particularly in the neck, shoulders, and back (12; 13).

The study's implications for practice are clear: there is a need for targeted educational initiatives to promote ergonomic awareness and healthier gaming habits among students. Interventions such as posture correction, regular breaks, and exercises to relieve musculoskeletal strain could be valuable in reducing the burden of these complaints. Moreover, physiotherapists and healthcare professionals should consider the role of internet gaming disorders when assessing patients with musculoskeletal symptoms, particularly in younger populations.

Future research should aim to address the limitations of this study by incorporating objective measures of musculoskeletal health, such as physical examinations or imaging studies, and by exploring the potential mediating factors that may influence the relationship between gaming disorder and musculoskeletal symptoms, including physical activity levels, mental health status, and ergonomic practices. Additionally, interventions targeting modifiable risk factors, such as gaming duration and posture, should be evaluated for their effectiveness in reducing the prevalence of musculoskeletal complaints among gamers. By addressing these gaps, future studies can provide more comprehensive guidance for the prevention and management of musculoskeletal disorders associated with internet gaming disorders.

CONCLUSION

In conclusion, the study reinforces the association between internet gaming disorder severity and musculoskeletal symptoms among university students, highlighting the need for preventive strategies and further research to better understand and mitigate these health risks.

REFERENCES

1. Cankurtaran F, Menevşe Ö, Namlı A, Kızıltoprak H, Altay S, Duran M, et al. The Impact of Digital Game Addiction On Musculoskeletal System Of Secondary School Children. Niger J Clin Pract. 2022;25(2):153-9.
2. Mokshathaa NB, Vishwas S. Internet Addiction And Gaming Disorder During The COVID-19 Pandemic Among Young People In Southern Karnataka. Cureus. 2023;15(7).
3. Calik BB, Yagci N, Gursoy S, Zencir M. Upper Extremities and Spinal Musculoskeletal Disorders And Risk Factors

In Students Using Computers. Pak J Med Sci. 2014;30(6):1361-6.
4. Noack-Cooper KL, Sommerich CM, Mirka GA. College Students And Computers: Assessment Of Usage Patterns And Musculoskeletal Discomfort. Work. 2009;32(3):285-98.
5. Katz JN, Amick BC, Hupert N, Cortes MC, Fossel AH, Robertson M, et al. Assessment Of Upper Extremity Role Functioning In Students. Am J Ind Med. 2002;41(1):19-26.
6. Myint WW, Saimon R, Majid NNNN, Saripuddin MB, Rajan RA. The Relationship Between Usage Of Digital Devices And Musculoskeletal Symptoms: A Cross-Sectional Study Among University Students In Sarawak. Int J Online Biomed Eng. 2021;17(9):46-57.
7. Pratama G, Widyanti A. Internet Addiction Among Indonesia University Students: Musculoskeletal Symptoms, Physical And Psychosocial Behavior Problems. IOP Conf Ser Mater Sci Eng. 2019;703(1):012050.
8. Dol KS. Fatigue And Pain Related To Internet Usage Among University Students. J Phys Ther Sci. 2016;28(4):1233-7.
9. Coniglio MA, Muni V, Giammanco G, Pignato S. Excessive Internet Use And Internet Addiction: Emerging Public Health Issues. Ig Sanita Pubbl. 2007;63(2):127-36.
10. Madeleine P, Vangsgaard S, Hviid Andersen J, Ge H-Y, Arendt-Nielsen L. Computer Work and Self-Reported Variables On Anthropometrics, Computer Usage, Work Ability, Productivity, Pain, And Physical Activity. BMC Musculoskelet Disord. 2013;14(1):1-10.
11. Hellström C, Nilsson KW, Leppert J, Åslund C. Effects Of Adolescent Online Gaming Time And Motives On Depressive, Musculoskeletal, And Psychosomatic Symptoms. Ups J Med Sci. 2015;120(4):263-75.
12. AlZarea BK, Patil SR. Mobile Phone Head And Neck Pain Syndrome: Proposal Of A New Entity. Headache. 2015;55(3):313-7.
13. Hansraj KK. Assessment Of Stresses In The Cervical Spine Caused By Posture And Position Of The Head. Surg Technol Int. 2014;25(1):277-9.
14. Berolo S, Wells RP, Amick BC. Musculoskeletal Symptoms Among Mobile Hand-Held Device Users and their Relationship To Device Use: A Preliminary Study In A Canadian University Population. Appl Ergon. 2011;42(2):371-8.
15. Mustafaoglu R, Yasaci Z, Zirek E, Griffiths MD, Ozdincler AR. The Relationship Between Smartphone Addiction And Musculoskeletal Pain Prevalence Among Young Population: A Cross-Sectional Study. Korean J Pain. 2021;34(1):72-81.
16. AlAbdulwahab SS, Kachanathu SJ, AlMotairi MS. Smartphone Use Addiction Can Cause Neck Disability. Musculoskeletal Care. 2017;15(1):10-2.
17. Sharan D, Mohandoss M, Ranganathan R, Jose J. Musculoskeletal Disorders Of The Upper Extremities Due To Extensive Usage Of Hand Held Devices. Ann Occup Environ Med. 2014;26(1):22.
18. Waheed N, Rathore M, Ihsan A, Asif I, Ahmed R, Qureshi K. Association Of Depression, Anxiety, And Musculoskeletal Symptoms With Internet Addiction Amongst Undergraduates Of University. J Pak Med Assoc. 2022;72(5):1-8.
19. Sekiguchi T, Hagiwara Y, Momma H, Tsuchiya M, Kuroki K, Kanazawa K, et al. Excessive Game Playing Is Associated With Musculoskeletal Pain Among Youth Athletes: A Cross-Sectional Study In Miyagi Prefecture. J Sports Sci. 2018;36(16):1801-7.
20. Yao JPR, Sundar V, Ramalingam V. Predictors Of Mobile Video Gaming On Musculoskeletal Pain Among University Students In Selangor, Malaysia. Rev Pesqui Fisioter. 2021;11(3):518-27.
21. Darvesh N, Radhakrishnan A, Lachance CC, Nincic V, Sharpe JP, Ghassemi M, et al. Exploring The Prevalence Of Gaming Disorder And Internet Gaming Disorder: A Rapid Scoping Review. Syst Rev. 2020;9(1):68.
22. Zuang LY, Zuang SY, Clements JB. Association Of Musculoskeletal Pain With Poor Quality Of Sleep Among E-Gamers In A Private University In Malaysia. INTI J. 2022;2022(4):125-31.
23. Kumar CS, Sharma MK, Amudhan S, Arya S, Mahapatra S, Anand N, et al. Digital Gaming, Musculoskeletal, And Related Health Hazards Among Adolescents And Young Adults. Indian J Psychiatry. 2023;65(6):698-700.
24. Lindberg L, Nielsen SB, Damgaard M, Sloth OR, Rathleff MS, Straszek CL. Musculoskeletal Pain Is Common In Competitive Gaming: A Cross-Sectional Study Among Danish Esports Athletes. BMJ Open Sport Exerc Med. 2020;6(1).
25. Geer R, Cheng J, Rothman R, Abutalib Z, Davenport K. Characterization of Gaming-Related Symptoms And Musculoskeletal Pain Complaints In Individuals Who Participate In Electronic Gaming. Am J Lifestyle Med. 2023;17(4):15598276231175396.
26. Gillespie R, Nordin M, Halpern M, Koenig K, Warren N, Kim M. Musculoskeletal Impact Of Computer And Electronic Game Use On Children And Adolescents. Ergonomics. 2006;16(3):531-45.
27. Hakala PT, Saarni LA, Punamäki RL, Wallenius MA, Nygård CH, Rimpelä AH. Musculoskeletal Symptoms and Computer Use Among Finnish Adolescents: Pain Intensity and Inconvenience To Everyday Life. BMC Musculoskelet Disord. 2012;13(1):41.