FREQUENCY OF NECK AND BACK FUNCTIONAL DISABILITY AMONG UNIVERSITY STUDENTS RELATED TO USAGE OF ELECTRONIC GADGETS DURING COVID-19 QUARANTINE

Sidra Arshad[1]

[1]Department of Physical Therapy, University of South Asia, Lahore, Pakistan

Highlights:

- Due to pandemic COVID-19 and quarantine physical activity is restricted among all age groups.
- Disabilities like neck and back are the most important problem for modern era. For about 71% of adults faced this disability in their life.
- Students are most prevalent for the risk of neck disability because they spend most of their time using electronic gadgets for online educational purpose.

Abstract

Objective:

To find out the frequency of neck and back functional disability among university students related to usage of electronic gadgets during COVID-19 quarantine.

Methodology:

A cross sectional study was carried out on 187 Participants, completed within 3 months. Data was collected from university students of University of Lahore, University of Central Punjab, University of Management and Technology and University of South Asia. In collection of data one online self-structured questionnaire and two scales i-e. Neck Disability Index (NDI) and Oswestry Disability Index (ODI) were used on the basis of inclusion and exclusion criteria.

Results:

During COVID-19 quarantine 39.6% participants had low back disability and 82.9% had neck disability due to usage of electronic gadgets. The association between usage electronic gadgets with low back disability is not significant and the association between usage electronic gadgets with neck disability is significant.

Conclusion:

Few numbers of participants were suffering from back disability and majority of the students had neck disability and causing functional limitations due to usage of electronic gadgets.

Key words:

Back disability; Neck disability; Quarantine; COVID-19

Introduction

Coronavirus disease (COVID-19) is a disease produced by a virus that reproduced rapidly in the world. The COVID-19 pandemic was a big challenge for the medical team and also a problem to education systems in the world. This pandemic has created a condition which was never seen before by us and we were making efforts to make it a better condition to deal with this pandemic by restricting ourselves from out-door activities and staying at home Due to COVID-19 quarantine many people were doing work from home including students which were attending their online classes and doing their educational work online on different electronic gadgets from home. Many recommendations were given by WHO to

ensure safety from exposure to virus.[3] Due to this pandemic COVID-19 and quarantine physical activity is restricted among all age groups.[4]

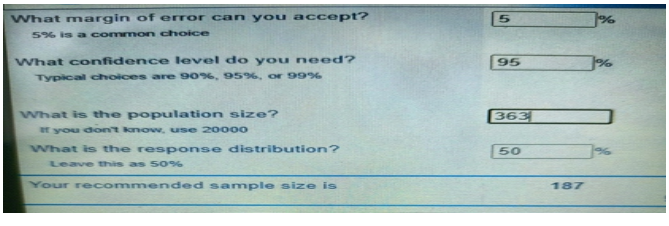
Online learning platforms have been established prior to the onset of the Covid-19 pandemic and have been notable for providing alternative methods for students to access learning materials outside of their physical school environment.[5] Working online or virtually is becoming extremely popular due to cost saving mainly; this is also a way to deal with the global pandemics.[6] Mobile phones usage is being increased from last few years. Majority users of these phones are young people including students. This excessive usage had shown bad effects to human body. Widespread use of electronic gadgets and heavy dependence, combined with life style changes, have given rise to a number of new health problems ranging from physical to psychological disorder.[9] Besides, the main disadvantage of usage of electronic gadgets excessively causing a problematic situation in students life by affecting their quality of life. [10,11] There is also research that smartphones are more responsible for bad effects on student's brain. This usage may also affect the physiology of the brain.[12,13]

Disabilities like neck and back are the most important problem for modern era. Neck disability is becoming increasingly common throughout the world. Excessive usage causes neck disability. Neck disability is more common in females, this frequency is more higher in developed countries and more higher in big cities people. Neck disability in the present study is assessed by using NDI (Neck Disability Index) scale. It is a ten-item scaled examination form used for people with neck disability. Its reliability is 0.89, validity 0.70. Back disability is the most common cause of musculoskeletal disorders in many regions. In this study back disability is measured by ODI (Oswestry disability index). ODI is a very effective scale to measure spinal disorders. This scale is most commonly used by physiotherapist. It is an easy scale to assess the issues of low back and yet has high reliability and constructs validity. Its correlation coefficient of ODI used for test retest reliability of 0.99 and for validity is 0.65. [20]

Teens who are physically less active are at a higher risk and more prone to suffering from LBP. It is most important for the people to be physically active for the prevention and management of low back disability. Inactivity and excessive activity both unhealthy activities of back and neck are at increased disability risk. Rationale of this study is to spread awareness about the causes of functional disability which affects their daily life. Usage of electronic gadgets are so common these days and mostly for young generation. The aim of the study is to find out the frequency of neck disability and back disability during COVID-19 quarantine among Participants who had extensively used the electronic gadgets that involves Smartphones, laptops, computers to make them aware of these disabilities and to make a way of decrees these disabilities.

Methodology

Cross-sectional study. Data was collected from University of Lahore, University of Central Punjab, University of Management and Technology and University of South Asia. Authors completed within 6 months after the approval of the synopsis. Sample size was 187 on the basis of the following values;

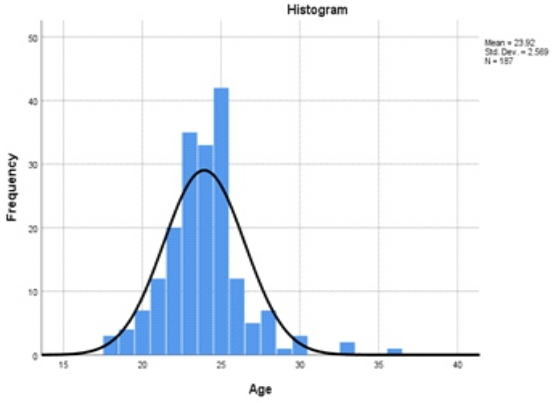


Non-Probability, Purposive sampling was used to collect data. Inclusion Criteria; participants who use electronic gadgets during COVID-19 Quarantine, both genders, age: 18-30years. Participants who had neck and back disability before pandemic and who are unable to complete the data were excluded. In collection of data one self-structured questionnaire, which includes demographic data and a section of electronic gadgets usage data and two Standardized Questionnaires i-e? Neck Disability Index (NDI) and Oswestry Disability Index (ODI) were availed. Both contain 10 parts which are concerned with data about daily activities, pain and concentration. These were used to evaluate the functional limitation related to disability among people with neck disability and low back disability respectively, on the basis of inclusion and exclusion criteria.
The data was analyzed through IBM SPSS version 25. Qualitative categorical variable was analyzed for frequency and percentages. Quantitative continuous variables were analyzed for mean and standard deviation. Chi square test was applied to find the association between two variables.

Results

This study included a total number of 187 participants. The mean age was 23.92. In which 121 (64.7%) were females' participants and 66 (35.3) were male participants. The descriptive result of our data showed that 29.4% participants spend 12-15 hours per day using the electronic gadgets while 26.2% participants spend 8-12 hours per day using electronic gadgets during COVID-19 quarantine. 67.4% participants used their android mobile while 28.9% participants used laptops. 43.3% participants' preferred half lying posture and 35.8% participants preferred sitting with support while using electronic gadgets. 39.6% participants had low back disability during COVID-19 quarantine and 82.9% had neck disability during COVID-19 quarantine while using electronic gadgets.

Figure I.



Out of 187 participants 23.92 were mean, 2.569 with std. deviation, 18 with minimum and 36 with maximum years of age.

Table 1: Frequencies percentages of baseline characteristics

Variables	Construct	Frequency	Percentage
Gender	Male	66	35.3%
	Female	121	64.7%
Frequent electronic Gadgets you use	Ordinary Computer Screen	2	1.1%
	Laptop	54	28.9%
	Tablet/iPad/note	1	0.5%
	Android mobile	126	67.4%
	Apple mobile (iPhone)	4	2.1%
Hours spend	2-8 hours	48	25.7%
	8-12 hours	49	26.2%
	12 - 15 hours	55	29.4%
	More than 15 hours	35	18.7%
The hours you spend on your digital screen	Interrupted	97	51.9%
	Continuous	90	48.1%
COVID -19 Quarantine mostly effects your	Body posture	99	52.9 %
	Respiratory system	4	2.1 %
	Mental status	46	24.6 %
	ADLs (activities of daily life)	38	20.3 %
Musculoskeletal disorders during COVID -19	Neck disability	53	28.3 %
	Back disability	104	55.6 %
	Hand and wrist disability	9	4.8 %
	Any other disorder	21	11.2 %

Table 2: Neck and low back disability

Variables	Construct	Frequency	Percentage
Neck Disability intensity	No disability (I have no disability at the moment)	51	27.3%
	Mild disability (The disability is very mild at the moment)	82	43.9%
	Moderate disability (The disability is moderate at the moment)	40	21.4%
	Fairly severe (The disability is fairly severe at the moment)	11	5.9%
	Very severe (The disability is very severe at the moment)	3	1.6%
Low Back Disability intensity	No disability	67	35.8%
	Minimal disability	88	47.1%
	Moderate disability	18	9.6%
	Severe disability	6	3.2%
	crippled	3	1.6%
	bed bound	5	2.7%
Frequency of Neck and low Back Disability	ODI	74	39.6 %
	NDI	155	82.9 %

Above table shows that 39.6% participants have Back disability and 82.9% participants have neck disability out of a total number of 187 participants during COVID-19 quarantine while using electronic gadgets

Table 3: Association between Usage of Electronic Gadget with Low Back Pain disability Index.

Usage of electronic gadgets	Minimal disability	Moderate disability	Severe disability	Crippled	Total	P Value
2-8 hours	31	16	1	0	48	
8-12 hours	37	10	1	1	49	*0.099
12 -15 hours	25	28	2	0	55	
More than 15 hours	20	12	2	1	35	
Total	113	66	6	2	187	
Association between Usage of Electronic Gadget with Neck pain disability Index.						
Usage of electronic gadgets	No disability	Mild disability	Moderate disability	Severe disability	Complete disability	P Value
2-8 hours	10	31	4	3	0	
8-12 hours	16	26	6	1	0	
12 -15 hours	3	36	14	1	1	*0.008
More than 15 hours	3	22	10	0	0	
Total	32	115	34	5	1	

Out of 187 participants 48 used electronic gadgets for 2-8 hours, 49 used electronic gadgets for 8-12 hours, 55 used electronic gadgets for 12-15 hours and 35 used electronic gadgets for more than 15 hours. *p value=0.099. Above table shows that association between usage electronic gadgets and low back disability is not significant. Out of 187 participants 48 used electronic gadgets for 2-8 hours, 49 used electronic gadgets for 8-12 hours, 55 used electronic gadgets for 12-15 hours and 35 used electronic gadgets for more than 15 hours. *p value=0.008. Above table shows that association between usage electronic gadgets and neck disability is significant.

Discussion

The study was done on 187 participants. The mean age of the study was 23.92. In which 121 were female participants and 66 were male participants with a percentage of 64.7% and 35.3% respectively. This study concludes that there was strong association between Neck disabilities with usage of electronic gadgets during COVID-19 quarantine. The results of this study shows that the frequency of neck disability among university students who were electronic gadget users was 82.9% and the association between the usage of electronic gadgets and neck disability was significant with a p-value of 0.008. If we go through to the previous studies, we'll got to know that in a study they included 50 participants and results shows that in 72% participants out of 50 participants had neck disability because of the usage of computers.

A study found a strong association found between the computer usage and neck disability with a p-value of 0.001. Another study in which sample size was of 40 participants shows that there was a strong association between the cervical or neck muscle tension or disability with electronic gadget

users (video-game players) with a p-value of 0.05. This study concludes that there was no association between back disabilities with usage of electronic gadgets during COVID-19 quarantine. The results of current study shows that the frequency of back disability among university students who were electronic gadget users was 39.6% and the association between the usage of electronic gadgets and back disability was insignificant with a p-value of 0.099. Previous study in which sample size of 6003 with a response rate of 68% in which of 14-, 16- and 18-years old participants were included. The results of this study shows that out of 6003 only 12% participants had issue of LBP.

These participants were the only participants which are using the gadgets more than 5 hours and had LBP. – Similarly another study in which 2735 sample size were included shows that only 17.5% out of the 2735 participants were using electronic gadgets for more than 5 hours and thus decreasing LBP possibility. The descriptive result of our data showed that 29.4% participants spend 12-15 hours per day using the electronic gadgets while 26.2% participants spend 8-12 hours per day using electronic gadgets during COVID-19 quarantine. 67.4% participants used their android mobile while 28.9% participants used laptops. 43.3% participants' preferred half lying posture and 35.8% participants preferred sitting with support while using electronic gadgets. 39.6% participants had low back disability during COVID-19 quarantine and 82.9% had neck disability during COVID-19 quarantine while using electronic gadgets. 51.9% spent interrupted hours and 48.1% spent continuous hours on digital screen.

This study shows that out of 187 participants 29.4% spend 12-15 hours, 26.2% spend 8-12 hours, 25.7% spend 2-8 hours and 18.7% spend more than 15 hours using electronic gadgets during COVID-19 Quarantine. If we go through the previous study which was conducted on 31022 participants shows that there was a strong co-relation between the screen timing or electronic usage and physical complains of the participants. This study shows that out of 187 participants 67.4% were android mobile users, 28.9 were laptop users, 2.1% were apple mobile (iPhone) users, 1.1 were ordinary computer screen and 0.5 were Tablet/iPad/note users. Another previous literature in which sample size was 989 in 2016 was conducted. Results of this study shows that 97.5% of the young social media users were using social media sites on electronic gadgets and had excessive screen time. 87% of these participants were smartphone users, 74% were computer or laptop users, 41% tablet users, 11% of cellphones users.

All these electronic gadgets were with internet access. Previous study with 400 sample size shows that there is a strong correlation between musculoskeletal disability and laptop users. The observation of our study and others demonstrates that there must be more studies on these types of disability and about awareness of these disabilities. Results from all these studies and our study shows that sitting with support and half lying decreases back disability but bad posture and consistent screen time increases neck disability. Neck and back disability were also common before pandemic but during pandemic mostly participants facing these disabilities were students and workers. As they are working from home so these types of situations are commonly faced.

Conclusion

That there was a strong association between neck disability and usage of electronic gadgets and there is no association between low back disability and usage of electronic gadgets. Few numbers of participants were suffering from

back disability and majority of the students had neck disability that cause functional limitations due to usage of electronic gadgets.

Recommendations and Limitations

After conducting the survey and analyzing the results of the present study, more research work is required in this case. Further factors contributing to neck and back disability can be explored e.g., BMI, Age and posture. Postural changes should be measured manually by the researchers by the help of postural grid. This study used convenient sampling technique future studies should be conducted by using randomized sampling methods for more accurate results. Health care providers should not only treat but they should also advise the people to prevent from risk factors and Professional Physiotherapist should introduce specific managements in this case. As this study was an observational study respondents included were not clinically examined. Data was collected from students that only confined to university students. The symptoms discussed in this study can also be seen in other diseases. Due to COVID-19 pandemic situation we were not able to conduct one on one data collection from the participants.

REFERENCES

01- Daniel J. Education and the COVID-19 pandemic. Prospects. 2020;49(1):91-6.

02- Wells CR, Townsend JP, Pandey A, Moghadas SM, Krieger G, Singer B, et al. Optimal COVID-19 quarantine and testing strategies. Nature communications. 2021;12(1):1-9.

03- Baradaran Mahdavi S, Kelishadi R. Impact of sedentary behavior on bodily disability while staying at home in COVID-19 pandemic and potential preventive strategies. Asian Journal of Sports Medicine. 2020;11(2).

04- Shahidi SH, Stewart Williams J, Hassani F. Physical activity during COVID–19 quarantine. Acta Paediatrica. 2020;109(10):2147-8.

05- Race R. Emergency response online classes during community quarantine: An exploratory research to Philippine private schools. Universal Journal of Educational Research. 2020;8(8):3502-8.

06- Raišienė AG, Rapuano V, Varkulevičiūtė K, Stachová K. Working from Home—Who is Happy? A Survey of Lithuania's employees during the COVID-19 quarantine period. Sustainability. 2020;12(13):5332.

07- Hegde AM, Suman P, Unais M, Jeyakumar C. Effect of electronic gadgets on the behaviour, academic performance and overall health of school going children-a descriptive study. Journal of Advanced Medical and Dental Sciences Research. 2019;7(1):100-3.

08- Sarla GS. Excessive use of electronic gadgets: health effects. The Egyptian Journal of Internal Medicine. 2019;31(4):408.

09- Annadurai K, Mani G, Danasekaran R. Evolution of electronic gadgets and emergence of high-tech diseases. Digital Medicine. 2015;1(1):49.

10- Mucci F, Mucci N, Diolaiuti F. Lockdown and isolation: psychological aspects of COVID-19 pandemic in the general population. Clinical Neuropsychiatry. 2020;17(2):63-4.

11- Akurke S, Li Y, Craig B, editors. Effect of smartphone use on upper extremity and neck. International Conference on Applied Human Factors and Ergonomics; 2017: Springer.

12- Kamaruddin PSNM, Nawi AM. Smartphone Usage and Pattern on Self-reported Symptoms Among Medical Students in Universiti Kebangsaan Malaysia During the COVID-19 Lockdown. 2020.

13- Khan AF, Gillani SFUHS, Khan AF. Are you suffering disability neck due to smart phone text neck syndrome. Age. 2018;42(58.4):41.6.

14- Sitthipornvorakul E, Janwantanakul P, Purepong N, Pensri P, van der Beek AJ. The association between physical activity and neck and low back disability: a systematic review. European Spine Journal. 2011;20(5):677-89.

15- Sabeen F, Bashir MS, Hussain SI, Ehsan S. Prevalance of neck disability in computer users. Annals of King Edward Medical University. 2013;19(2):137-.

16- Hoy D, Protani M, De R, Buchbinder R. The epidemiology of neck disability. Best practice & research Clinical rheumatology. 2010;24(6):783-92.

17- Vernon H, Mior S. The Neck Disability Index: a study of reliability and validity. Journal of manipulative and physiological therapeutics. 1991.

18- Külcü DG, Gülşen G, Altunok TÇ, Küçükoğlu D, Naderi S. Neck and low back disability among dentistry staff. Archives of Rheumatology. 2010;25(3):122-9.

19- Šagát P, Bartík P, Prieto González P, Tohănean DI, Knjaz D. Impact of COVID-19quarantine on low back disability intensity, prevalence, and associated risk factors among adult citizens residing in riyadh (Saudi Arabia): A cross-sectional study. International journal of environmental research and public health. 2020;17(19):7302.

20- Vigatto R, Alexandre NMC, Correa Filho HR. Development of a Brazilian Portuguese version of the Oswestry Disability Index: cross-cultural adaptation, reliability, and validity. Spine. 2007;32(4):481-6.

21- Heneweer H, Vanhees L, Picavet HSJ. Physical activity and low back disability: a U-shaped relation? Disability. 2009;143(1-2):21-5.

22- Torsheim T, Eriksson L, Schnohr CW, Hansen F, Bjarnason T, Välimaa R. Screen-based activities and physical complaints among adolescents from the Nordic countries. BMC public health. 2010;10(1):1-8.

23- Rini I, Lestari NT. The correlation between gadget usage and cervical muscle tension among the community of gamers. Enfermeria clinica. 2020;30:149-53.

24- AlZarea BK, Patil SR. Mobile phone head and neck disability syndrome: proposal of a new entity. Headache. 2015;251:63.

25- Sihawong R, Sitthipornvorakul E, Paksaichol A, Janwantanakul P. Predictors for chronic neck and low back disability in office workers: a 1-year prospective cohort study. Journal of occupational health. 2015:15-0168-OA.

26- Hakala PT, Rimpelä AH, Saarni LA, Salminen JJ. Frequent computer-related activities increase the risk of neck–shoulder and low back disability in adolescents. The European Journal of Public Health. 2006;16(5):536-41.

27- Mythily S, Qiu S, Winslow M. Prevalence and correlates of excessive Internet use among youth in Singapore. Annals Academy of Medicine Singapore. 2008;37(1):9.

28- Villanti AC, Johnson AL, Ilakkuvan V, Jacobs MA, Graham AL, Rath JM. Social media use and access to digital technology in US young adults in 2016. Journal of medical Internet research. 2017;19(6):e196.

29- Obembe AO, Johnson OE, Tanimowo TO, Onigbinde AT, Emechete AA. Musculoskeletal disability among undergraduate laptop users in a Nigerian University. Journal of back and musculoskeletal rehabilitation. 2013;26(4):389-95.