International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2019): 7.583

Correlation of Continuous Use of Smartphone with Musculoskeletal Disorders among Professional College Students

Arima A R[1], Roshni Rajan[2], Ann K Mathew[3]

[1] MPH Scholar, Kerala University of Health Sciences, School of Medical education Kottayam district Kerala, India

[2] MPH Scholar, Kerala University of Health Sciences, School of Medical education Kottayam district Kerala, India

[3]Research Consultant

Abstract: ***Now a day's Smartphone are the prime choice for a great majority of the people in the younger age groups for sparring their free time and also act as their first choice for getting new information for updating their knowledge. This study mainly aim to understand whether the prolonged use of Smartphone's causing any musculoskeletal disorders. Aim & objectives: To study Smartphone addiction and neck disability among college students. .Material &Methodology: The study examined 183 professional college students from Kottayam district Kerala by systematic random sampling in age group of 18 to 30 years. Students were asked to fill a Performa with the questionnaire of Smartphone addiction scale and neck disability index. Spearman Correlation coefficient was used to assess the relationship between SAS and NDI. Results: Spearman correlation coefficient showed positive moderate correlation between Smartphone Addiction Scale and Neck Disability Index (r=0.484, p <0.05). Conclusion: The study showed that musculoskeletal disorders are prevalent among professional college students because of continuous usage of smartphones.***

Keywords: Smartphone, musculoskeletal disorders, Neck disability index, Smartphone addiction scale

1. Introduction

With a rise in Smartphone ownership globally, China will have highest number of smart phone users, 1.3 billion in 2018, followed by India with 530 million users and as by U.S 229 million (The Indian Express Daily 16th Oct 2017). The concerns have also increased about musculoskeletal problems associated with prolonged use of smart phones. Recent investigations have shown that smart phone users tend to report pain in neck, shoulders, and thumb and severity of the symptoms increase with the total time spent on smart phone. Since smartphone users search the internet, chat with others using social networking service ,document writing, and also perform other tasks while looking at their phone's small monitor. Their constant and repeated positions in certain posture can cause musculoskeletal disorders and other health problems [1] [18]

Most previous studies of musculoskeletal disorders have been based on student's use of computer. However many students use smartphone for longer period because they are small, easy to portable and accessible. For Professional college students it is a valuable devise for their academic activities, but because of that they are more prone to use smartphone frequently. Even though everyone knows about the consequences of continuous usage of Smartphone, Smartphone usage is inevitable for everyone in their daily life [6] [10]. The highlight of this research include study of relationship between Smartphone addiction and musculoskeletal disorders.

2. Literature Survey

2.1 Smartphone and musculoskeletal disorders

Smartphone are small portable device mainly used for communication. But now smartphone used beyond communication but also for many other purposes like entertainment, business, education, gathering, storage and convey information's etc. Now smartphone are the prime choice for social medias where almost of the people are interested in their life. And without any doubt we can see people of all ages and generations including infant to old age using smartphone are essential for human in their modern way of life[21] [22].

By this much usage or essentially smartphone is this modern life, of the people are addicted to smartphones. The people who are mostly addicted are children, teenagers and young adults. This addiction to smartphones causes various psychological and physiological problems to the users. Nowadays musculoskeletal problems are occurring to the users rapidly and these problems affected their health dramatically and indirectly to all their life style and life. Today the college students are always using their smartphone for chatting, gaming, study purpose etc. The prolonged use of smartphone cause musculoskeletal problems. The main cause of the pain is their posture while using smartphone. The common posture we can see is forward head posture. It is the one of the main cause of neck pain. Because an impact on soft tissue that surrounded the spine. When we active on smartphone, we bend our necks to read and texting. This consent and repeated movement repeat up to hundred times in a day, can be damaging to physical health and increased stress on the cervical spine. As the head is held forward in poor posture the cervical spine must support increasing amounts of weight. One rule of thumb is that for

Licensed Under Creative Commons Attribution CC BY

every inch that the head is bend forward in poor posture an additional 10 pounds of weight is felt on the cervical spine. The end result is prolonged flexion of the neck when bent over these electronic devices resulting in the "text neck syndrome". Musculoskeletal problems were more prevalent among students who spent the most time on their smartphone (more than five hours a day)

3. Problem Definition

Smartphone marketing penetration increases in India. The age group of smartphone users varies, ranging from students to workers to elderly peoples. Since smartphone users search the internet, chat with others using social networking service, write documents, and perform other tasks while looking at their smartphone small monitor, their constant and repeated positions in certain posture cause musculoskeletal disorders. Few studies are reported about this substantial increase in the number of college student's smartphone users, having various psychological and physical problems. In recent years, which is becoming an epidemic and a large impact globally.

4. Method & approach

A total of 400 students were available for the study. A survey was conducted among them to find those who have smartphones and a list of 345 students have been made. By using Epi info version 7, the sample size was calculated with a confidence interval of 95% and it was estimated to be 183. Systematic random sampling done for this study. The k value was found to be 1.8. The students were selected by systematic random sampling method from the sample frame made from the survey list. The odd numbers in the list were selected randomly.

4.1Outcome measurements [14][17]

4.1.1. Smartphone addiction scale (SAS) The SAS is a self-reporting scale to assess Smartphone addiction. It consists of six factors and 23 items, with a three -point Likert scale (1.rarely 2. Sometimes 3.always). Scores range from 23 to 69. The higher the score, the greater the degree of pathological use of the smartphone .The SAS is a reliable and valid measurement tool for the evaluation of smartphone addiction.

4.1.2.Neck disability index (NDI) The NDI assessment involves a 10-item, 50-point index questionnaire that assesses the effects of neck pain and symptoms during a range of functional activities.10 Of the 10 items, four relate to subjective symptoms (pain intensity, headache, concentration, sleeping), four activities of daily living (lifting, work, driving, recreation) and two discretionary activities of daily living (personal care, reading) Each item is scored on a 0 to 5 rating scale, in which zero means „No pain" and 5 means „Worst imaginable pain. The test was interpreted as a raw score, with a maximum score of 50. A higher NDI score indicates greater neck disability. This index is the most widely used and most strongly validated instrument for assessing self-rated disability in patients with neck pain.

5. Result and Discussion

The data analysis for the quantitative process includes sample characteristics and bivariate analysis. Univariate descriptive were expressed as frequency with their percentage. Spearman Correlation coefficient was used to assess the relationship between SAS and NDI. The respondence are males and females professional college students. Most of whom were female (76.5%) and male (23.5%). Spearman correlation coefficient showed positive moderate correlation between smartphone addiction scale and neck disability index ($r=0.484$, $p<0.05$). This indicates that smartphone addiction can cause musculoskeletal disorders

Table: Variables and frequencies

Variables	*Frequency*	*Percent*
Smartphone addiction scale		
Mild	103	56.3
Moderate	59	32.2
Severe	21	11.5
Total	183	100
Neck disability index		
Very mild	110	*60.1*
Mild	52	28.4
Moderate	12	6.6
Severe	9	4.9
Very severe	0	0
Total	183	100

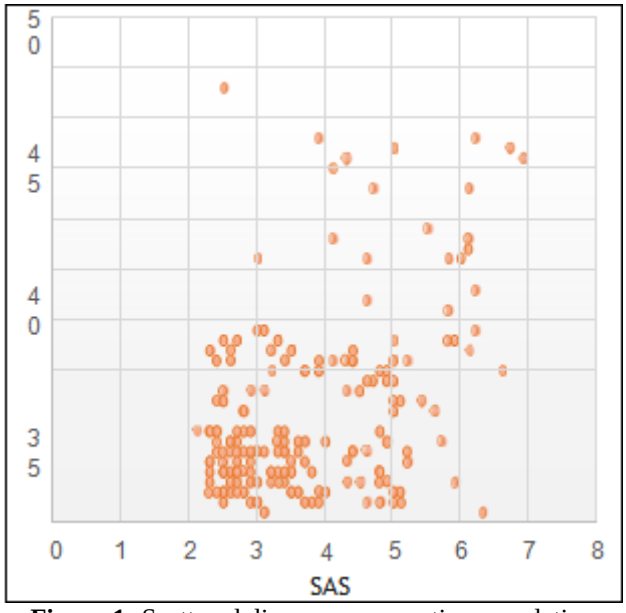

Figure 1: Scattered diagram representing correlation between SAS (X-axis) and NDI (Y-axis)

The present study also shows Smartphone Addiction can cause neck disability. Association between mobile phone use and neck pain in university students: A cross- sectional study conducted by Fadi al Hadid they also concluded significant positive correlation between the duration of phone use and severity of NDI.

Licensed Under Creative Commons Attribution CC BY

6. Conclusion

The overall findings of the study clearly showed that the musculoskeletal disorders are prevalent among the professional college students because of continuous usage of smartphones. Thus it can be conclude that the investigation has achieved the objective for assessment based on the study findings. There for similar study can be replicated on a large sample to generalize the findings.

7. Future Scope

Increase in the use of smartphones in the societies has raised concern about psychological and physiological effects of excessive use of smartphones especially among college students. Smartphone addiction is still not sufficiently addressed within studies in literature, so what is suggested is more in-depth qualitative and quantitative studies in the future with larger sample sizes and the development of policies to raise awareness about this issue by Kerala governments for better future of Kerala's young generation.

References

[1] Ajay Raj Sethuraman, ShivaniRao , Lena Charlette, Pandurang Vithal Thatkar, Vivin Vincent (2018)International Journal of Community Medicine and Public Health
[2] Alfawareh, H.M., and Jusoh, S. (2014). Smartphones usage among university students:Najran University case. International Journal of Academic Research, 6 (2).321-326.
[3] Andrew WW, Sarah P L & Con Stough. Does Evening Exposure To Mobile Phone, 2006; (2).69- 76.
[4] Cancer Institute, vol. 93, no. 3, Feb.7,2001.
[5] Chen B, Liu F, Ding S, Ying X, Wang L, Wen Y. Gender differences in factors associated with smartphone addiction: a cross-sectional study among medical college students. BMC Psychiatry.2017; 17:341.
[6] Dr. Priyal P. correlation of smartphone use addiction with text neck syndrome and SMS thumb in physiotherapy students, international journal of community medicine and public health (2018)
[7] E.Tonga,B. Ozgul, E.Timutas, M. can, Y.hasirci, M.G.Polat. Marmara University , Faculty of health sciences, Department of Physiotherapy and rehabilitation , Marmara university , Istanbul, Turkey 2017 health professionals in rheumatology abstracts
[8] Froese, A. D., Carpenter, C. N., Inman, D. A., Schooley, J. R., Barnes, R. B.,Brecht, P. W.,& Chacon, J. D. (2012). Effects of classroom cell phone use on expected and actual learning.College Student Journal. 46(2). 323-332.
[9] Harris, M.A., Patten, K., and Regan, E. 2013. "The Need for Byod Mobile Device Security Awareness and Training," Proceedings of the Nineteenth Americas Conference on Information Systems, Chicago, Illinois.
[10] HYO-JEONG-KIM,DH,PhD,JIN-SEOP KIM,PT,PhD The relationship between smartphone use and subjective musculoskeletal symptoms and university students,I PECInc(2015)
[11] Johansen , J D Boice, J K Mclaughlin, J organ H. Olsen. Cellular Telephones And Cancer – A Nation Wide Cohort Study In Denmark, Journal of The National
[12] Kim HJ, Kim JS. The relationship between smartphone use and subjective musculoskeletal symptoms and university students. J Phys Ther Sci: 2015;27(3):575
[13] Kwon M, Kim DJ, Cho H, Yang S. The smartphone Addiction Scale: Development and validation of a short version for adolescents. PloS ONE. 2013;8(2):1-7.
[14] M. J. H.cCarthy.M.P .Grevitt. P. Silicocks.G. Hobbs.(2007) The reliability of the Vernon and minor neck disability index, and its validity compared with the short form-36 health survey questionnaire
[15] Market Analysis and Consumer Research Organization. Study of mobile phone usage among the teenagers and youth in Mumbai.2004.
[16] McEvov SP, Stevenson MR, Mccertt AT, Woodward M, Ha worth C. Role of mobile phone in motor vehicle crashes resulting in hospital attendance in Sydney. Br. Med. J. 2005; 20(4):331-428
[17] Min Kwon, Dai – Jin Kim, Hyun Cho, Soo Yang 2013 PLoSONE
[18] MINKYUNG-LEE,YUNKYUNG HONG,SEUNGHOON LEE,JINYOUNG WON The effect of smartpone use on upper extremity muscle activity and pain threshold,IPECInc(2015).
[19] Ongondo FO, Williams ID. Greening academia: use and disposal of mobile phones among university students. 2011. Available from Ovidmedline(r).
[20] Radiation Affect Subsequent Melatonin Production, Int. J RadiationBiology. 82,
[21] Sami S.ALAbdulwahab PT PhD| Shaji john kachanathu| Mohammed Saleh ALMotairi PT,Smartphone use addiction can case neck disability, WILEY(2017).
[22] Sanjeev Davey and Anuradha Davey Assessment of smarphone addiction in Indian Adolescents:A mixed method study by systematic_review and meta- analysis approach,international journal of preventive medicine.(2014)
[23] Shan Z, Deng G, Li J, Li Y, Zhang Y, Zhao Q.Correlational analysis of neck/shoulder pain and low back pain with the use of digital products, physical activity and psychological status among adolescents in Shanghai. PloS One 2013; 8(10): e78109.
[24] Stalin P, Abraham SB, Kanimozhy K, Prasad RV,Singh Z, Purty AJ. Mobile phone usage and its health e®ects among adults in a semi-urban area of Southern India. J Clin Diagn Res2016; 10(1):LC14.
[25] Subramani Parasuraman, Aaseer Thamby Sam (2017) Smartphone usage and increased risk of mobile phone addiction: A concurrent study, International journal of pharmaceutical intervention.
[26] Tariq rahim suomro(2013), Impact of smartphone's on society Europan journal of scientific research.vol9
[27] The smartphone addiction scale: Development and validation of short version for adolescents.
[28] Venkatesh E, Jemal M, Samani A. Smart phone usage and addiction among dental students in Saudi Arabia: a cross sectional study. Int J AdolescentMed Health.2016;10(15):01

Licensed Under Creative Commons Attribution CC BY

Author Profile

Dr. Arima AR (PT) has received her Bachelor's degree in Physiotherapy in 2017 and Master's degree in public Health in 2020 from Kerala University of Health Sciences. Currently working as programme coordinator at Integrated Rural Technology Center, Kerala. She is well versed in DPR preparation, SPSS, Epi Info and was intern at foundation of health care technology society, New Delhi. During the PG programme actively involved in research works.

Dr. Roshni Rajan has received the Bachelor of Ayurvedic Medicine and Surgery degree and Master degree in Public Health from Kerala University of Health Sciences in the years 2017 and 2020 respectively. Two year Research experience in the field of epidemiological studies at the time of PG programme and expert in SPSS. She was intern at foundation of health care technology society, New Delhi and also NRHM, Ernakulum, Kerala.During the PG programme actively involved in research and its analysis.

Dr. Ann K Mathew has received her Master's degree in Public Health from Mahatma Gandhi University with a University Rank and obtained her doctoral degree (PhD) from the same university. She is having her UGC-NET certification in Social Medicine and Community Health. She is having Post graduate teaching level experience in the Department of Public Health (MPH) for more than 17 years in Mahatma Gandhi University, Kerala. She is a research consultant, guide and a resource person (Public Health), pursuing higher studies also having paper presentations and publications in National and International peer reviewed journals and have international affiliation.

Licensed Under Creative Commons Attribution CC BY