Open Access

Original Article

Prevalence of Online Fatigue during COVID-19: A Cross-Sectional Study on Academicians of Rawalpindi

Syed Fawad Mashhadi, Nazish Khan, Ibtesam Shaukat, Anees Saad, Ali Hassan Cheema, Ali Jan Hassan

Army Medical College/National University of Medical Sciences (NUMS) Rawalpindi Pakistan

ABSTRACT

Objective: To determine prevalence of online fatigue among academicians and to analyse factors associated with online fatigue.

Study Design: Analytical, cross-sectional study.

Place and During of Study: The study was conducted online from Nov 2021 to Apr 2022 on academicians belonging to educational institutions and teaching hospitals of Rawalpindi Pakistan.

Methodology: One hundred fifty academicians, aged 20-75 years, belonging to Rawalpindi were enrolled through snowball sampling. Data was collected online by using google forms. A validated questionnaire having an online fatigue scale was used. Partial responses were excluded. Qualitative variables were expressed as frequency and percentage while quantitative variables were expressed as mean and S.D. Chi-square test was applied.

Results: Out of 150 academics, 72(48%) were males and 78(52%) were females. Mean age of participants was 32±9.4 years. Amongst the study participants 27(18%), 67(44.7%), 50(33.3%) and 6(4%) suffered from mild, moderate, severe and extreme online fatigue respectively. The degree of online fatigue was found to be significantly associated with female gender (p=0.000), older age (p=0.005) and higher level of education (p=0.002). Association of online fatigue with factors such as workplace (p=0.054), residence (p=0.129) and amount of technology usage (p=0.995) was found to be statistically insignificant.

Conclusions: Our study showed that online fatigue was prevalent among the academic community of Rawalpindi, especially females. Online fatigue can be reduced by training the academicians about work-life balance and updating their knowledge on practical technology.

Keywords: Fatigue, Health, Technology, Workload.

How to Cite This Article: *Mashhadi SF, Khan N, Shaukat I, Saad A, Cheema AH, Hassan AJ. Prevalence of Online Fatigue during COVID-19: A Cross-Sectional Study on Academicians of Rawalpindi. Pak Armed Forces Med J 2022; 72(Suppl-4): S874-878. DOI: https://doi.org/10.51253/pafmj.v72iSUPPL-4.9684*

INTRODUCTION

The COVID-19 pandemic, which emerged due to rapid and widespread infection with a new corona-virus (called SARS-CoV-2), has impacted millions of people worldwide.[1] According to the World Health Organization,[2] as of January 2021, there were more than 82 million confirmed COVID-19 cases across 219 countries. Non pharmacological Interventions for mitigating the spread of COVID-19 included closure of educational institutions and workplaces, among many others. This affected the way people were used to work as people had to shift their work online. These changes also significantly impacted how institutions of higher education (IHEs) operated. In order to minimize disruption to student learning due to these closures, many IHEs began offering courses online. For this purpose, most educational Institutions started utilizing technologies similar to those adopted for remote work. Due to social distancing measures, many IHEs had to turn to videoconferencing tools, such as Zoom, WebEx, Blackboard Collaborate, Skype, Adobe Connect and Microsoft Teams, for online synchronous course delivery.[3] Whereas a large number of population was unaware of these technologies before the pandemic, they had to switch to these technology willingly or unwillingly. Many people faced the stress of learning to use new applications within a short span of time.

Although the growth in information and communication technology (ICTs) has had many positive outcomes, it has also led to misuse and overuse, resulting in over 25% of the general working population complaining of lack of time and energy due to digital technology.[4] Some recent researches have defined a new form of fatigue resulting from unwarranted use of technology and labelled it as "Online Fatigue" or "Zoom fatigue" Consequently, an "Online Fatigue Scale" was developed to evaluate the phenomenon. Psychology identifies a definite connection between new technology and psychological stress, being termed as "technostress, which is used synonymously to online fatigue. Work form home or "remote working" involves undue use of technology coupled with prolonged working hours, so people's experience of fatigue can be linked both to excessive use of

Correspondence: Dr Nazish Khan, Department Community Medicine, Army Medical College Rawalpindi Pakistan

technology and novel work modalities. Online fatigue can thus be conceived of as a psychological fatigue experienced due to stresses of overuse of a particular technology and managing personal family life concurrently. COVID-19 pandemic, amidst other challenges, also brought forward a challenge for people to learn new working platforms and tools quickly and adapt themselves to the new technology. This all, overlapping with the expectations of their work managers to always remain connected and available added to the psychological exhaustion of workers.

RaguNathan *et al.*[6] defined technostress as an "individual's attempts to deal with constantly evolving ICTs and the changing physical, social, and cognitive responses demanded by their use". Tarafdar *et al.*[7] described it as stress experienced by users as a result of emerging applications, multitasking, constant connectivity, information overload, frequent system upgrades, constant uncertainty, continual relearning, as well as technical problems associated with the organizational use of ICT. Bullock A,[8] in his research, reports that Zoom fatigue or videoconferencing fatigue arises when individuals spend too much time looking at computer/phone screens and manifests as emotional, psychological and/or physical exhaustion.

In Pakistan after the dawn of the COVID-19 pandemic, IHEs decided to shift their mode of education delivery to online platforms, which, though beneficial in ensuring social distancing SOPs, resulted in increased workload and burden for the faculty members putting them at an increased risk of experiencing online fatigue. Very limited research has been conducted in Pakistan on this topic so this study was conducted to highlight the importance of this emerging issue and address the psychological consequences of excessive technology use.

METHODOLOGY

This cross-sectional study was conducted online among the academicians in various educational institutions and teaching hospitals, of Rawalpindi Pakistan over a period of 6 months, from November 2021 to April 2022. Approval was sought from Ethical Review Committee of Army Medical College (ERC/ ID/ 219) prior to study. Participants were enrolled through snowball sampling after taking informed consent.

Inclusion Criteria: Academicians of either gender, aged 20-75 years, employed in various educational institutions of Rawalpindi Pakistan were included in the study.

Exclusion Criteria: Incompletely filled forms were considered invalid and were excluded from the study.

Sample size was calculated by using Raosoft sample size calculator. Keeping 95% confidence interval and margin of error 5%, a sample size of 150 was calculated.

Due to ongoing pandemic study was conducted online using google forms. A validated structured Techno-stress questionnaire was used to collect data. Links to fill the forms were sent to the study participants via face book, whatsapp and institutional emails. The questionnaire required about 5-10 minutes to be completed. The teachers who wanted to participate in the study could open a link and receive a detailed cover letter with electronic informed consent. Data was analysed using Statistical package for social sciences (SPSS) version 23. Quantitative variables were as mean and standard deviation. Categorical variables were expressed as frequency and percentages. Pearson's chi-square test was applied to find association between online fatigue levels and various variables. *p*-value<0.05 was taken as statistically significant.

RESULTS

Out 150 participants who completed the survey, 72(48%) were males and 78(52%) were females. Mean age of participants was 32±9.4 years. In regards to education 100(66.7%) were graduates, 43(28.7%) were post-graduates and 7(4.7%) were Ph.D. Majority of the participants, 60(40%) were employed in university, followed by 45(30%) working in colleges and 41(27.3%) working in schools. Sociodemgraphic details of study participants are given in Table-I.

Table-I: Sociodemographic details of participants (n=150)

Variables	Frequency (n)	Percentage (%)
Gender		
Male	72	48
Female	78	52
Age group		
20-43 years	131	87.3
44-75 years	19	12.7
Level of Education		
Graduation	100	66.7
Post-graduation	43	28.7
PHD	7	4.7
Workplace		
University	60	40
College	45	30
School	41	27.3
Hospital	4	2.7

Our study showed that 27(18%) of participants experienced mild fatigue, followed by 67(44.7%) who experienced moderate fatigue, 50(33.3%) reported

severe fatigue while 6(4%) reported extreme online fatigue as shown in Figure-1.

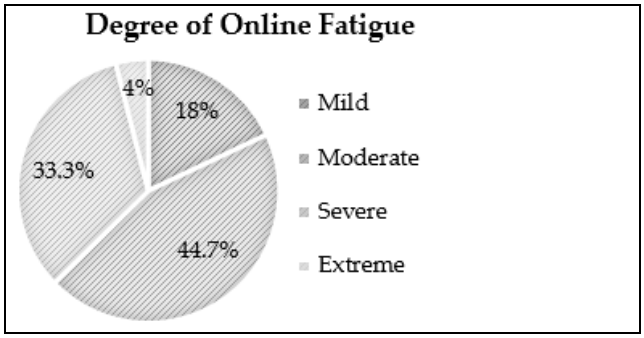

Figure-1: Degree of Online Fatigue Among the Participants

Severity of Online fatigue was more in females as compared to males as shown in Figure-2.

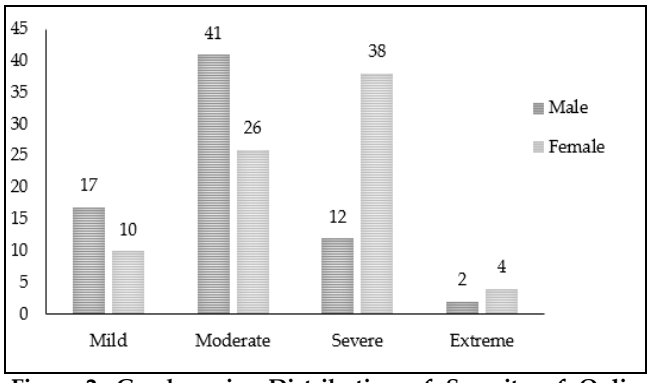

Figure-2: Gender wise Distribution of Severity of Online Fatigue

According to our study, the degree of online fatigue was found to be significantly associated with female gender (p<0.001), older age (p=0.005), higher level of education (p=0.002) and higher workload (p<0.001). However, association of degree of online fatigue with factors such as workplace (p=0.054), residence (p=0.129) and amount of technology usage (p=0.995) was found to be statistically insignificant**.** These results are given in Table-II.

DISCUSSION

COVID-19 pandemic has brough about significant changes in day-to-day life of people, one of which is the transition from conventional working and learning modalities to more sophisticated digital technology. Academicians being highly indulgent in technology-based teaching and working are at a high risk to be affected by all the psychological consequences of this altered work environment termed as online fatigue, zoom fatigue or techno stress. We conducted this study to determine the prevalence of online fatigue among academicians of Rawalpindi. This group of professionals experienced the greatest shift in their work routine to online work from home. Our study showed that academicians did suffer from a significant degree of fatigue which especially affected female academicians. Academicians in older age groups and those with greater workload were also significantly affected. Previous literature has shown association between online work and fatigue.

Table-II: Association of online fatigue with various variables (n=150)

Variables	Degree of Online fatigue				*p*-value
	Mild n(%)	Moderate n(%)	Severe n(%)	Extreme n(%)	
Gender					
Male	17(23.6)	41(56.9)	12(16.7)	2(2.8)	<0.001
Female	10(12.8)	26(33.3)	38(48.8)	4(5.1)	
Age					
20-43 years	26(19.8)	63(48.2)	38(29.0)	4(3.0)	0.005
44-75 years	1(5.3)	4(21.0)	12(63.2)	2(10.5)	
Level of Education					
Graduation	21(21)	50(50)	26(26)	3(3)	0.002
Post-graduation	5(11.7)	15(34.8)	22(51.1)	1(2.4)	
PHD	1(14.3)	2(28.6)	2(28.6)	2(28.6)	
Duration of Technology usage					
<1 hour	4(17.4)	10(43.4)	9(39.1)	0(0)	0.995
1-5 hours	12(19.1)	29(46.1)	19(30.1)	3(4.8)	
5-10 hours	8(17.1)	21(44.6)	16(34.1)	2(4.2)	
>10 hours	3(17.6)	7(41.2)	6(35.3)	1(5.9)	
Workplace					
University	10(16.7)	33(55.0)	15(25.0)	2(3.3)	0.054
College	13(28.9)	16(35.6)	15(33.3)	1(2.2)	
School	3(7.3)	15(36.6)	20(48.8)	3(7.3)	
Hospital	1(25.0)	3(75.0)	0(0)	0(0)	

An editorial written by Golu,[9] highlights that tech fatigue is caused by the extended time spent in front of the screens and can have harmful consequences on the physical and psychological health of people. Deniz ME *et al*.[10] in their study evaluated the psychological consequences of increased videoconferencing by means of a "Zoom Exhaustion and Fatigue Scale". They reported that Zoom exhaustion and fatigue was associated with anxiety and depression and negatively associated with life satisfaction and academic well-being. Their study suggests the potential avenues that have to be explored to address and protect the psychological well being of those exposed to excessive videoconferencing as a normal daily routine.

Findings of our study are supported by studies conducted by Molino *et al*.[11] and Weiderhold BK *et al*.[12] These studies showed that feeling of exhaustion more aptly called technostress, were developed as a result of multitasking, constant connectivity, frequent system

updates, acquiring up to date skills and technical issues associated with the use of technology.

In our study, the key conclusions were that online fatigue was significantly associated with female gender, higher level education and older age group. These findings were consistent with studies conducted previously. A study conducted by Fauville G *et al*,[13] showed that recurrent meetings, lengthier meetings and lesser time between meetings augmented fatigue among women. Messner CK,[14] in a case study also showed that online fatigue was significantly associated with higher education, findings similar to our study. Oducado RM,[15] in his study showed that online fatigue was significant among teachers of older age, finding similar as reported in our study.

Our study also showed that online fatigue wasn't significantly associated with workplace and amount of technology usage. However, contradictory findings were reported by a study conducted by Bonanomi *et al*.[16] Their study showed that online fatigue was significantly associated with greater usage of technology.

Tobing AV *et al*,[17] analysed data from a webinar conducted for mental health to overcome zoom fatigue. They concluded that mindfulness-based interventions were helpful for the participants to overcome their stress and reduce the symptoms of zoom fatigue. Williams N,[18] in his research states that home working and video conferencing have not only increased the psychological demands of the employees but have also reduced the level of physical activity. It has also led to muddling of boundaries between work and home. People have reported working for extended hours and not being available online becomes an issue. This has now emerged as a new form of occupational distress and ill health.

LIMITATIONS OF STUDY

Our study represents a specific population's views at one time, their beliefs and attitudes reflect the information available at the time and not over extended time period. Secondly, the results were self-reported. Measurement error and reporting bias may exist. Finally, since snow ball sampling is used so the sample may not be representative of whole population yielding a low generalizability of the results.

RECOMMENDATIONS

Main reasons for Online fatigue as explored in literature are multitasking, constant connectivity, frequent system updates, acquiring up to date skills, technical issues associated with the use of technology, more frequent meetings, and longer meetings. It can be mitigated by training the academicians about work-life balance and updating their knowledge on practical technology. As this is newly emerging phenomenon which has gained obvious importance during COVID-19, policies should be formulated to decrease its prevalence to avoid its associated harmful effects on psychological well-being.

CONCLUSION

Our study showed that online fatigue was prevalent among the academicians of Rawalpindi and is particularly associated with female gender, older age groups, higher education level and increased workload.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

SFM: Conceptualization and design of the study, statistical analysis, technical support, reviewing the manuscript & final apporval of the version to be published.

NK: Conceptualization and design of the study, editing the manuscript & final apporval of the version to be published.

IS: Literature review, data collection, statistical analysis, interpretation of results, writing introduction, methodology, results and abstract, reference writing, compiling and editing the manuscript & final apporval of the version to be published.

AS: Literature review, data collection, writing introduction, methodology and results, reference writing, reviewing the manuscript & final apporval of the version to be published.

AHC: Literature review, data collection, writing discussion and references, reviewing the manuscript & final apporval of the version to be published.

AJH: Literature review, data collection, writing conclusion, editing the manuscript & final apporval of the version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investi-gated and resolved.

REFERENCES

1. CDC. Coronavirus Disease 2019 (COVID-19) [Internet] at Centers for Disease Control and Prevention. 2020. Available from: https://www.cdc.gov/coronavirus/2019-ncov/yohealth/need-to-know.html
2. World Health Organization. WHO COVID-19 dashboard [Internet] at World Health Organization. 2022. Available from: https://covid19.who.int/
3. Sidpra J, Gaier C, Reddy N, Kumar N, Mirsky D, Mankad K. Sustaining education in the age of COVID-19: a survey of synchronous web-based platforms. Quantitative Imaging in Medicine and Surgery. 2020; 10(7): 1422.

4. Korunovska J, Spiekermann S. The effects of digitalization on human energy and fatigue: A review. Vienna University of Economics and Business, Vienna 2019, Available at: https://www.researchgate.net/publication/336303977_The_Effects_of_Digitalization_on_Human_Energy_and_Fatigue_A_Review
5. Brivio E, Gaudioso F, Vergine I, Mirizzi CR, Reina C, Stellari A, Galimberti C. Preventing technostress through positive technology. Frontiers in psychology. 2018; 9(1): 2569.
6. Ragu-Nathan TS, Tarafdar M, Ragu-Nathan BS, Tu Q. The Consequences of Technostress for End Users in Organizations: Conceptual Development and Empirical Validation. Information Systems Research. 2008; 19(4): 417–433.
7. Tarafdar M, Tu Q, Ragu-Nathan TS, Ragu-Nathan BS. Crossing to the dark side. Communications of the ACM. 2011; 54(9): 113.
8. Bullock A, Colvin AD, Jackson MS. Zoom fatigue in the age of COVID-19. J Social Work Global Commun 2022; 6(1): 2-5.
9. Golu F. Tech Fatigue-A new pandemic. Studia Doctoralia. 2021; 12(2): 85-7.
10. Deniz ME, Satici SA, Doenyas C, Griffiths MD. Zoom Fatigue, Psychological Distress, Life Satisfaction, and Academic Well-Being. Cyberpsychology, Behavior, and Social Networ 2022; 25(5): 270-277.
11. Molino M, Ingusci E, Signore F, Manuti A, Giancaspro ML, Russo V, Zito M, Cortese CG. Wellbeing costs of technology use during Covid-19 remote working: An investigation using the Italian translation of the technostress creators scale. Sustainability. 2020; 12(15): 5911-5915.
12. Wiederhold BK. Connecting through technology during the coronavirus disease 2019 pandemic: Avoiding "Zoom Fatigue". Cyberpsychology, Behavior, and Social Networking. 2020; 23(7): 437-438.
13. Fauville G, Luo M, Muller Queiroz AC. Nonverbal mechanisms predict zoom fatigue and explain why women experience higher levels than men. Available at SSRN 3820035. 2021.
14. Massner CK. Zooming in on zoom fatigue: A case study of videoconferencing and zoom fatigue in higher education. Liberty University; 2021. Available at: https://digitalcommons.liberty.edu/doctoral/3030/
15. Oducado RM. A Cross-sectional Exploration of Zoom Fatigue among Filipino University Teachers. Available at SSRN. 2021.
16. Bonanomi A, Facchin F, Barello S, Villani D. Prevalence and health correlates of Onine Fatigue: A cross-sectional study on the Italian academic community during the COVID-19 pandemic. PloS one. 2021; 16(10): e0255181.
17. Tobing AV, Irawan V, Salim Y, Sulistyawati SW. Participants' Levels of understanding before and after attending the zoom fatigue during COVID-19 Pandemic Webinar. World Journal of Advanced Research and Reviews. 2022; 13(1): 338-342.
18. Williams N. Working through COVID-19: 'Zoom'gloom and 'Zoom'fatigue. Occupational Medicine. 2021; 71(3): 164-167.

.....