

Impact of Technostress on Employees during Remote Work

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Abstract

The rapid shift of companies moving to working from home and depending on remote work tools now more than ever, in an effort to maintain business continuity, especially during world wide spread of COVID-19. Technology has become a lifeline that helps organizations and teams stay connected, conduct meetings, share documents, and perform other necessary work tasks and allowing teams to collaborate, operate and communicate virtually through the power of technology. Remote working has a diverse set of challenges for the multiple parties involved. Constant technology use has potentially negative physical and mental effects, often referred to as “technostress.” The aim of this study is to find out how remote work was affected by technostressors, such as techno-overload and techno-invasion and examine their relationship with gender. A total of 176 employees who are working remotely from various sectors were chosen as respondents for this study. The data was analyzed using hypothesis testing and descriptive analysis. The results of the analysis indicate that, in general, the remote working employees experienced a moderate level of technostress and with regards to technostress dimensions, the respondents were found to experience a high level of techno-invasion and moderate level of techno-overload. Also while considering the gender, males were mostly affected by techno-overload and irrespective of the gender, both male and female were affected by techno-invasion.

Keywords: technostress, remote working, work-family conflict, technology use

1. Introduction

Recently the COVID-19 outbreak has forced millions of workers around the globe, across different industries, to work from home. Remote working, social distancing, and work from home have emerged as the new buzzwords that everyone is talking about and relying on for seamless operations in these distressing times. Technology and creative tech products are actually making these concepts a reality by allowing employees to perform their daily duties from the safety of their homes. Maintaining day-to-day communication is vital to continue the work flow at your company, and luckily, there is plenty of technology to support it.

Remote working is increasing among employees during the pandemic and this may impact both physical and mental health and costing employers lost productivity, higher absenteeism, higher turnover, lower engagement levels, missed deadlines and low morale. Remote work requires updated knowledge of different software applications and the latest technologies. Many remote workers who are inexperienced with technology might find this intimidating which can cause 'Technostress'. Employees experience Technostress when they cannot adapt to or cope with too many technologies in a healthy manner and feel compulsive about sharing constant updates, feel forced to respond to information in real-time, and engage in multitasking with multiple apps. This stress could lead to reduced job satisfaction which makes employees less committed to their work.

1.1 Literature Review

During the last decades, Information and Communications Technology advanced at a fast pace and impacted on work in all sectors. Though there are many advantages, a negative side of this phenomenon exists with a connection between Technology and higher levels of stress among workers. According to the World Health Organization (WHO), the increased use of technology has modified work patterns today; it has engendered an everlasting urgency and fostered expectations about individuals being constantly available and working faster and better. Selye(1956) states that stress is unavoidable in life and no individual will spare from stress. Technostress is the negative psychological link between people and the introduction of new technologies. The term technostress was originally coined by Craig Brod (1984), who described it as a disease caused by one's inability to cope or deal with technologies in a healthy manner. Later, Weil and Rosen (1997) defined technostress as "any negative impact on attitudes, thoughts, behaviours, or body physiology that is caused either directly or indirectly by technology".

Symptoms of technostress start with apprehensive feelings toward technology use that may lead to anxiety and stress. Unattended anxiety may evoke psychosomatic symptoms such as muscle cramp, headache, joint pain, insomnia and other physical well being. More recently, technostress has been defined as "the stress that users experience as a result of application multitasking, constant connectivity, information overload, frequent system upgrades and consequent uncertainty, continual relearning and consequent job-related insecurities, and technical problems associated with the organizational use of ICT"(Ametz,1997).

Evidence from the literature showed several symptoms related to technostress, such as anxiety, physical diseases, behavioural strain, technophobia, mental fatigue, memory disturbances, poor concentration, irritability, feelings of exhaustion, and insomnia(Coklar & Sahin,1997). Among the main frequent consequences of technostress, recent studies found reduced worker

productivity, job performance, job satisfaction and organizational commitment, lowered ICTs use intention and increased turnover intentions (Ayyagari, Grover & Purvis, 2011). A further outcome is work–family and work–life conflict, increased by work-overload and flexibility due to technology use (Yun, Kettinger & Choong, 2012). Ayyagari and colleagues (2011) found that technology generates stress via work–home conflict and role ambiguity as mediators.

Technology-related job demands that can provoke technostress are generally named technostressors or technostress creators. Two significant stressors have been acknowledged as originating from the use of ICTs for work purposes (Torre et al., 2019). The first one is related to information overload: the multiple technological sources can produce a great amount of information and stimuli that lead to fatigue and loss of control over information flow for the users (Derks, Mierlo & Schmitz, 2014). The second stressor refers to constant availability: thanks to the aid of ICTs (Internet connection, smartphones, tablets, laptops) workers can be connected at any time and everywhere; this fact supports expectations of constant reachability, availability and instant responses (Ghislieri et al., 2014).

Tarafdar and colleagues (2007) proposed a classification, widely accepted in the literature, of five technostress creators: (1) techno-overload, related to ICT's potential to compel users to work faster and longer or change work habit; (2) techno-invasion, referring to ICT's ability to invade users' personal life and make the boundaries between work and private contexts more blurred; (3) techno-complexity, describing situations where ICT's features and complexity make users feel inadequate with respect to their skills; (4) techno-insecurity, related to potential users' feeling of being threatened about losing their jobs, due to a replacement by automation or others who have a better ICT knowledge and, (5) techno-uncertainty, associated with continuous upgrades and changes in ICT that disturb users and force them to constantly learn new aspects of ICTs.

1.2 Objectives of the Study

This study aimed to:

- i) Find out how remote work was affected by techno-stressors, such as techno-overload and techno-invasion.
- ii) Examine the difference of stress level based on techno-overload and techno-invasion.
- iii) Identify the difference of stress level of techno-stressors and gender.

2. Research Methodology

The aim of the study was to investigate if there is any difference between the technostress creators(techno-overload and techno-invasion) and gender. Thus the following hypotheses were formulated :

H0a: There is no significant difference in techno-overload with respect to gender.

H1a: There is significant difference in techno-overload with respect to gender.

H0b : There is no significant difference in techno-invasion with respect to gender.

H1b: There is significant difference in techno-invasion with respect to gender.

Hypotheses is tested using Independent sample t-test.

Procedure and participants

The data for this study were collected from 176 remote workers working in various sectors . The study adopted a random sampling approach. All the respondents fulfilled the research criteria that they have been doing work since the pandemic COVID-19 has started. Data was collected by using a questionnaire(Likert scale multiple choice questions) comprising two sections. The first section includes 4 items on the demographic background of the respondents such as gender, employment sector, age and how long they have been working remotely. The second section aimed to measure technology and technostress. The technology stress questionnaire was adapted from Tarafdar and colleagues that is widely accepted in the literature which contains five technostress creators. Technostress creators were assessed through 7 items taken from the technostress creators scale: four items for techno-overload, three items for techno-invasion Table A1 in Appendix A shows the original version of the 7 items. Participants used a Likert scale from 1 = strongly disagree to 5 = strongly agree.

Table 1. Composition of respondents with respect to gender, employment sector, age and how long they have been working remotely

Variable	Percentage (%)	Number of Respondents(N)
Gender		
Male	52.3	92
Female	47.7	84
Employment Sector		
IT Software	80.1	141
Education/Teaching	5.1	9
Sales/Business development	4.6	8

Banking	2.3	4
E-Commerce	0.6	1
Others	7.3	13
Age		
18-24	71	125
25-34	23.9	42
35-44	2.9	5
45-54	1.1	1
Above 55	1.1	1
How long have been working remotely		
More than 4 months	80.7	142
2-4 months	13.1	23
Less than 2 months	6.3	11

Table 1 revealed the demographic data of the respondents. It indicates that 52.3% (N=92), were male and 47.7% (N=84) were female. In terms of employment, 80.1%(N=141) works in IT Software sector, 5.1%(N=9) in Education/Teaching sector, 4.6%(N=8) in Sales/Business development sector, 2.3%(N=4) in Banking sector, 0.6%(N=1) in E-Commerce sector and 7.3%(N=13) from other sectors like BPO, HR, Insurance, Customer care agents, Quality and Engineering. The age of respondents, 71% (N=125) of them are between 18 to 24 years, 23.9% (N=42) between 25 to 34 years, 2.9% (N=5) between 35 to 44 years, 1.1% (N=2) between 45 to 54 years and 1.1% (N=2) were 55 years and above. Majority of the respondents (80.7%, N=142) were working remotely for more than 4 months, 13.1% (N=23) for 2-4 months, 6.3% (N=11) for less than 2 months.

Analysis

Technostress creators were assessed through 7 items taken from the technostress creators scale : four items for techno-overload and three items for techno-invasion. The Statistical Package for Social Sciences (SPSS) was used to analyze the data. Descriptive statistics and Independent Sample t test were used to test the data. The frequencies, mean, standard deviation and cross tabulation were used. The relationship between techno-overload and techno-invasion were compared with gender.

3.Results and Discussion

3.1 Level of Stress Among the Respondents

Two technostress creators namely techno-overload and techno-invasion were considered.

3.1.1 Techno-overload and stress

Table 2 : Technostress and techno-overload

Questions	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	S D
I am forced by the technology to do more work than I handle	176	14.2%	22.2%	32.4%	21%	10.2%	2.91	2.187
I am forced by the technology to work much faster	176	13.6%	28.4%	29%	21.6%	7.4%	2.81	2.145
I am forced to change my work habits to adapt to new technologies	176	7.4%	21%	25.6%	30.1%	15.9%	3.26	2.176
I have a higher workload because of increased complexity of the technology	176	11.4%	27.3%	26.7%	24.4%	10.2%	2.95	2.177
	176	11.65%	24.725%	28.425%	24.275%	10.925%	2.98	2.171

Table 2 illustrates the descriptive statistics of level of stress considering the techno-overload construct. Four questions were asked to the respondents and the results were obtained.

Strongly Disagree was marked as 1 and Strongly Agree was marked as 5. Mean and standard deviation were obtained using this data. Majority of the respondents reported having moderate levels of stress. Considering question 1 about 36.4% disagreed having been forced by technology to do more work than they could handle, while 31.2% agreed that they had stress. The results were similar for question 2 and 4. But most people (46%) agreed that they are forced to change work habits to adapt to new technologies while working from home.

3.1.2 Techno-invasion and stress

Table 3: Technostress and techno-invasion

Questions	N	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	S D
I have to be always available for work due to the technology	176	10.8%	16.5%	25%	30.7%	17%	3.27	2.234
I have to sacrifice time to keep current on new technologies	176	9.7%	18.8%	28.4%	28.4%	14.8%	3.20	2.191
I spend less time with my family due to the technology	176	14.2%	18.8%	24.4%	21%	21.6%	3.17	2.346
	176	11.56%	18.03%	25.93%	26.7%	17.8%	3.21	2.257

Table 3 illustrates the descriptive statistics of level of stress considering the techno-invasion construct. Three questions were asked to the respondents and the results were obtained. Strongly Disagree was marked as 1 and Strongly Agree was marked as 5. Mean and standard deviation were obtained using this data. The data clearly shows that respondents were having a high level of technostress. For questions 5,6 and 7 , the respondents agreed were 42.4%, 43.2% and 42.6% respectively. 25.93% had a neutral opinion for this.

3.2 Difference of Stress Level Among Male and Female Respondents

3.2.1. Gender and techno-overload

Table 4 : Gender and Techno-overload

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Techno_Overload	Equal variances assumed	2.021	.157	1.080	174	.281	.15826	.14647	-.13083	.44734
	Equal variances not assumed			1.089	172.861	.278	.15826	.14532	-.12858	.44509

Hypothesis testing interpretation:

The hypotheses for Levene's test are:

H_0 : The population variances of group 1 and 2 are equal

H_1 : The population variances of group 1 and 2 are not equal

This implies that if we reject the null hypothesis of Levene's Test, it suggests that the variances of the two groups are not equal, that the homogeneity of variances assumption is violated.

Here as the p value of Levene's test (0.157) greater than 0.05, equal variance is assumed which indicated that there is a homogeneity of variance. Therefore the corresponding p value for independent sample test is .281. Since, P value greater than 0.05, the null hypothesis is accepted.

Therefore we interpret that “ There is no significant difference in techno-overload with respect to gender”.

3.2.2. Gender and techno-invasion

Table 5 : Gender and techno-invasion

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Techno_invasion	Equal variances assumed	.044	.834	1.011	174	.314	.16684	.16509	-.15899	.49267
	Equal variances not assumed			1.012	173.258	.313	.16684	.16489	-.15861	.49229

Hypothesis testing interpretation:

If P value(sig value) less than 0.05, the null hypothesis is rejected and alternate hypothesis is accepted. If p value greater than 0.05, the null hypothesis is accepted.

Here as the p value of Levene's test (0.834) greater than 0.05, equal variance is assumed which indicated that there is a homogeneity of variance. Therefore the corresponding p value for independent sample test is .314. Since, P value greater than 0.05, the null hypothesis is accepted.

Therefore we interpret that “ There is no significant difference in techno-invasion with respect to gender”.

Also from cross tabulation of techno-overload and gender,it is visible that among 176 respondents 92 were male and 84 were female. Considering the male respondents, the mean % of the gender who suffered from techno-overload is 49.1% and 33.68% disagreed with the techno-overload in remote working. Among the female respondents, 30.66% agreed of having techno-overload while 39.31% disagreed. Thus there is a minor variation of techno-invasion and gender that males comparatively affected by techno-invasion than females. By comparing techno-invasion and gender,by taking the mean of the percentage of 3 items of Techno-invasion, 46.02% of male agree having techno-invasion while 27.17% disagree. Among the females, 42.86% agree and 32.14% disagree. Thus it shows a high degree of techno-invasion is faced by both male and females.

3.3 Difference of Stress Level with other demographic factors

Considering the employment sectors, the respondents working in the IT Software sector were having a moderate level of techno-overload and techno-invasion. Employment sectors like Education/Teaching, Sales/Development and other sectors have high levels of technostress.

All the age groups have a moderate level of techno-overload. Irrespective of the age, techno-invasion is high.

Also all the people working less than 2 months at home have a lower amount of techno-overload and techno-invasion while people working for more than 2 months remotely have moderate amounts of techno-overload and very high amount of techno-invasion

4. Limitation of the Study

Researchers could not generalize the study concerned to all people working in various sectors. Besides, the number of respondents was not persuaded for generalization. Furthermore, the study depends solely on questionnaires of past research. Few more technostress creators could be included so that each aspect can be clearly understood. Finally, as there are broad aspects of technology, however, this study deliberately focuses on technology and techno stress during remote work .

5. Suggestions for Future Research

There are several suggestions that could be undertaken for future research. Firstly, a study could be performed to examine the different personalities of the respondents dealing with technostress. Further explore the type of personality that successfully copes with stress and vice versa. Secondly, future research could be done by conducting interviews with respondents to identify other variables that might relate to technostress. The use of semi structured interviews also might help the researcher to enhance the standardized questionnaires. Finally researchers might focus on other psychological health effects related to techno stress such as anxiety, phobia and depression.

Future studies are necessary to verify whether these results, particularly the role of workload and remote working as antecedents of techno-stressors, persist also during traditional times. Moreover, a wider investigation of technostress antecedents is needed, in order to identify the main risk factors and adopt proper solutions. In this sense, it could be useful to understand if and how individual factors could have a role in technostress effects. More in depth, it would be functional to detect the potential role of personality traits on the experimentation of technostress, considering those studies linking personality and the ease of technology use.

6. Conclusion

The main findings in this study found that the use of technology may contribute to unhealthy psychological impact particularly stress. Although, there was a moderate level of stress among all the respondents, it is essential to identify risk and health factors in relating with technostress to enable preventive and intervening approaches.

Among the main findings, results highlighted positive associations between the two technostressors, confirming the necessity to deal with the massive use of technologies for work purposes and its negative consequences. It is clear that irrespective of the gender, both male and female are affected by techno-overload and techno-invasion. Moreover, the study indicated both workload and remote working as antecedents of technostress creators, as suggested above, interventions on working cultures and in the human resources management field are necessary to prevent negative consequences of technology use and to foster a positive implementation of remote working.

Employers and organizations concerned have to handle this matter seriously by providing training to staff that equip them with motivation and other measures. Understanding technostress and the ways in which technology affects a person individually might decrease the potential physical and psychological harm.

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