Technostress Among Workers During Pandemic COVID-19: Managerial Versus Professional

Teknostress pada Pekerja di Masa Pandemi COVID-19: Kajian Manajerial dan Profesional

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ARTICLE INFO	ABSTRACT
Keywords: Technostress, Techno-Overload, Techno-Invasion, Techno-Complexity, Techno-Insecurity, Techno-Uncertainty	This study aims to assess the differences in technostress received by workers at the managerial level and professional workers during the COVID-19 pandemic. This study uses a comparative research design concerning Techo-Overload, Techno-Invasion, Techno-Complexity, Techno-Insecurity, and Techno-Uncertainty between the two groups of workers were studied. Questionnaires were distributed to 119 of workers. The results of the independent sample t-test showed that all the null hypotheses for the variables Techno-Overload, Techno-Invasion, Techno-Complexity, Techno-Insecurity, and Techno-Uncertainty were rejected, which means that there is no difference in technostress between workers at the managerial level and professional workers. Meanwhile, based on the Mann-Whitney U Test, it is known that the level of technostress measured only by Techo-Invasion has differences between the two groups of workers. The result indicates that the massive use of technology amid COVID-19 is disturbing the personal lives of workers at the managerial level.

INFO ARTIKEL	ABSTRAK
Kata kunci: *Technostress, Techno-Overload, Techno-Invasion, Techno-Complexity, Techno-Insecurity, Techno-Uncertainty*	*Penelitian ini bertujuan untuk mengkaji perbedaan technostress yang diterima pekerja di level manajerial dan pekerja profesional selama pandemi COVID-19. Penelitian ini menggunakan desain penelitian komparatif mengenai Techo-Overload, Techno-Invasion, Techno-Complexity, Techno-Insecurity dan Techno-Uncertainty antara dua kelompok pekerja yang diteliti. Kuesioner dibagikan kepada 119 sampel pekerja. Hasil independen sample t-test menunjukkan semua hipotesis null untuk variabel Techno-Overload, Techno-Invasion, Techno-Complexity, Techno-Insecurity, dan Techno-Uncertainty ditolak, artinya tidak ada perbedaan technostress antara pekerja di tingkat manajerial dan pekerja profesional. Berdasarkan Mann-Whitney U Test diketahui hanya tingkat technostress yang diukur dengan Techo-Invasion yang memiliki perbedaan diantara kedua kelompok pekerja tersebut. Hasil penelitian menunjukkan masifnya penggunaan teknologi di tengah COVID-19 sangat mengganggu kehidupan pribadi para pekerja di level manajerial.*

Introduction

This study aims to identify differences in technological stress or "technostress" received by individuals during the COVID-19 pandemic. The COVID-19 pandemic that began in early 2020 caused changes in human resource work activities. Work patterns that previously involved face-to-face interactions were carried out online during the pandemic. The existence of a social restriction policy encourages the development of a remote work pattern known as "work from home" and utilizes information technology.

Information technology transformation is carried out to facilitate work carried out by telecommuting. Various information technology applications were developed during the pandemic to make it easier for workers to work and interact. Applications for video conferencing technology, online file storage, online reports, and online forms can help with work and communication between employees inside and outside of the company.

The emergence and use of new technologies suddenly affect anxiety, stress, mental health, and certain behaviors in workers. Work related to technology can cause stress, or what is more commonly known as "technostress." Conceptually, the term "technostress" is a combination of technology and stress caused by psychological pressure experienced by a worker because of an office automation system (Odoh, Longinus, Ben Odigbo, and Onwumere, 2013).

In general, technostress has an impact on a person's physical and psychological condition. Acceptance of technostress will also differ from person to person. In a field of work that involves dealing with high technology daily, the evolution of technology has no effect on workers' levels of anxiety (Alam, 2016). Several studies on technostress during the COVID-19 pandemic reported that the massive use of technology during the pandemic had a negative impact. Spagnoli and his team concluded through their research that the use of technology during a pandemic causes high levels of technostress. This is due to the use of multitasking applications, the high internet connectivity, the obligation to be online, and technical problems related to the use of information technology by the company (Topa et al., 2020). On the other hand, for marketers, during the pandemic, the use of technology affects the complexity and insecurity of workers (Khuzainil, Khuzaini; Zamrudi, 2021). On the other hand, for workers who work at a managerial level, the level of technostress indicated in terms of techno-overload and techno-complexity is very high (Pflügner, Katharina; Baumann, Annalena; Maier, 2021).

However, studies on technostress during the pandemic did not measure any differences in technostress between workers, both across sectors and based on their level of management. The existence of different classifications of worker and professional management, which also differ, will result in different levels of acceptance of technostress. This is related to managerial experience and the level of professionalism of workers who have different backgrounds. With these conditions, a special study is needed to identify differences in the level of technostress received between levels of workers.

Specifically, this study will identify the differences in technostress between workers at the managerial level and professionals. Individual and general technological stress have only been identified in previous studies. By identifying the differences in technostress between workers in the managerial and professional fields, the most effective policies to overcome the technostress of each group of workers can then be identified. Furthermore, policies that reflect the character and type of workers are expected to increase the work-life balance capacity of human resources in the face of an era of technology and digitalization that is increasingly massive.

Method

This study uses a causal-comparative study design using two independent variables. The researcher explores whether there are differences between workers who are at the managerial and professional levels of technostress because of the use of information technology and digitalization during the pandemic. Specifically, the independent variables in this study are workers who are at the managerial level and

workers who work in the professional field. Dependent variables in this study are techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty.

Technostress is often known as technophobia, cyberphobia, computer phobia, computer anxiety, and computer stress (Akhtari, P., Mohseni, M., Naderi, M., Akhtari, A.P.; Torfi, 2013). Specifically, several studies define technostress as a form of expressing individual acceptance of technological change (Ahmad, U. N. U.; Amin, S. M.; Ismail, 2012; Rolon, 2014). Furthermore, several researchers have formulated several variables in forming technostress, namely techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty (Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., Ragu-Nathan, 2007).

Techno-overload occurs when a worker is expected to work more and faster, even forced to multitask to meet demands (Tarafdar, M., Pullins, E. B., Ragu-Nathan, 2015; Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., Ragu-Nathan, 2007). Too much work and information overload can contribute to technology overload in today's workplace, which is characterized by technological disruption. Techno-overload can be caused by excessive workload caused using information and communication technology (Ayyagari, R., Grover, V., & Purvis, 2011). Information fatigue, one of the symptoms of technostress, may occur today because people who use technology are exposed to too much information, which cannot be absorbed by their brains properly and effectively.

Techno-invasion, also known as "technology invasion," is a concept used to describe a situation where technology makes it possible to contact people anytime and anywhere. This has an impact on the occurrence of violations of privacy and personal life (Tarafdar, M., Pullins, E. B., Ragu-Nathan, 2015). Work and personal lives are becoming increasingly interconnected due to the increasing use of information technology such as laptops and other devices with internet access. People's psychological pain will increase and accumulate over time when the conflict between work and life gets worse, which will lead to the creation of tension and stress (Ayyagari, R., Grover, V., and Purvis, 2011). Furthermore, physical, mental, emotional, and behavioral tensions will result from technological change, resulting in long-term suffering (Mawhinney, 2014). This results in workers experiencing dissatisfaction with their workplace environment (Ho-Jin, P., & Cho, 2014).

Techno-complexity refers to the term used to describe scenarios in which personnel must invest more time and effort to learn and master the information and skills needed to solve technological problems (Tarafdar, M., Pullins, E. B., Ragu-Nathan, 2015). This happens because there is a gap and mismatch between their skills and the requirements of the job offered, and employees may experience depression. People will suffer from burnout because of rapid changes and advancements, the complexity of information and communication technology that continues to grow from time to time, and this has the potential to harm overall job performance and satisfaction (Ayyagari, R., Grover, V., & Purvis, 2011).

Techno-insecurity is categorized as the mental state of workers who are afraid of losing their jobs because of the emergence of the latest technology. With the hiring of new workers, younger workers are considered more accustomed to and enthusiastic about using the latest technology. Furthermore, the influx of young and new workers has increased enthusiasm for technological advancements. This creates discomfort for existing workers, and they are skeptical of the arrival of information technology, so this can cause tension and stress (Tarafdar, M., Pullins, E. B., Ragu-Nathan, 2015).

Techno-uncertainty is described as a situation when technological advances do not provide opportunities for workers to gain familiarity with certain applications or systems (Tarafdar, M., Pullins, E. B., Ragu-Nathan, 2015). This condition will worry workers because their skills will soon become obsolete. Although they can be excited to learn new applications and technologies at first. Frustration and anxiety are ultimately caused by the unrelenting need to update and keep up with emerging technologies (Tarafdar, M., Pullins, E. B., Ragu-Nathan, 2015).

Table I Hypothesis Formulation

H$_{1a}$:	There is a techno-overload difference between managerial and professional-level workers
H$_{1b}$:	There is no difference in techno-overload between managerial and professional-level workers
H$_{2a}$:	There is a difference in techno-complexity between managerial and professional-level workers
H$_{2b}$:	There is no difference in techno-complexity between managerial and professional-level workers
H$_{3a}$:	There is a difference in techno-complexity between managerial and professional-level workers
H$_{3b}$:	There is no difference in techno-complexity between managerial and professional-level workers
H$_{4a}$:	There is a Techno-insecurity difference between managerial and professional-level workers
H$_{4b}$:	There is no difference in Techno-insecurity between managerial and professional-level workers
H$_{5a}$:	There is a techno-uncertainty difference between managerial and professional-level workers
H$_{5b}$:	There is no difference in techno-uncertainty between managerial and professional-level workers

Data were collected using an online self-report questionnaire as part of a project involving workers in Palembang City. Specifically, the questionnaire on technostress was distributed to 140 workers from various industrial sectors in the city of Palembang. Participants had two weeks to answer the questionnaire, which took about 15 minutes to complete. Following the objectives of the study, the workers, who were the respondents, were divided into two groups. The first group is made up of workers at the managerial level, and the second group is made up of professional workers. Research questionnaires were distributed to 150 worker respondents from various sectors in Palembang City. Based on the results of data collection, of the 140 questionnaires distributed, 21 failed, so only 119 could be processed. The link for filling out the online questionnaire was sent to 140 workers with different managerial levels and professions. At the end of the questionnaire, administration data were available for 140 individuals. Then 21 participants were excluded due to missing values. Thus, 119 workers were involved in the study. They were 53.8% male and 46.2% female. Age ranged from 28 to 69 years old (mean = 51.9; St.Dev. = 9.35).

Result and Discussion

In the business organization structure, the role of management is generally divided into three strata, namely lower, middle, and top levels. The higher you go, the fewer the managers, but the greater the responsibilities and the wider the authority. In this study, workers at the managerial level are defined as workers who act as leaders, both at the top management level and at the middle and lower management levels. Meanwhile, professional workers are categorized as workers who practice special skills. Based on 119 valid questionnaires, 58 respondents work as workers at the managerial level (49%), and 61 respondents are professional workers (51%).

Table II Respondent Distribution

Worker	Frequency	%
Managerial	58	48.74
Professional	61	51.26
	119	**100**

Source: Authors

The character of the research object city, which is controlled by the manufacturing industry sector as well as the wholesale and retail trade sectors, encourages the distribution of managerial workers who work at the lower and middle management levels. According to the data collected, most respondents (18%) are supervisors or shift supervisors, followed by shop managers (14%). Because most of the industrial sectors in the research object cities are processing industries, 12% of respondents in this study served as foremen. A foreman is in a managerial position that specifically oversees work units or divisions in the company's operations. Furthermore, of the respondents who are managerial workers at the middle management level, most of them are controlled by human resources managers, which is almost 11%.

Table III Respondent Position

Worker	Position	%
Managerial	Chief Executive Officer (CEO)	5.17
	Chief Financial Officer (CFO)	3.45
	Chief Financial Officer (CFO)	6.90
	Managing Director	5.17
	Human Resource Manager	10.34
	Financial Manager	6.90
	Supervisor	18.97
	Foreman	12.07
	Shift Supervisor	17.24
	Store manager	13.79
Professional	Educator	35.00
	Health Workers	13.33
	Reporter	6.67
	Architect	8.33
	Accountant	13.33
	Lawyer	10.00
	Engineer	8.33
	Sportsman	5.00

Source: Authors

The second group observed in this study were professional workers. Most of the professional workers who filled out the questionnaire were educators, which included teachers and lecturers (35%). Then there are health workers and accountants. Health workers include doctors, nurses, and midwives. Meanwhile, respondents categorized as accountants include public, internal, and tax accountants. Respondents who work as lawyers rank third in the distribution of respondents in this study, which is as much as 10%. The engineer respondents in this study were professional workers in the civil and mechanical fields.

Elaborating on the results of the mean and standard deviation is needed to report the results of descriptive statistical analysis (Ritchey, 2008). In the results of the descriptive statistics presented in Table 3, it is known that in the Techno-Invasion, Techno-Insecurity, and Techno-Uncertainty variables, the mean value of workers at the managerial level is higher than professional workers. These results indicate that there are differences in the level of technostress between managerial group workers and professional workers.

To answer research problems and answer hypotheses, t-test testing for independent samples was carried out. The use of a t-test for independent samples is appropriate if the dependent variable is continuous data and the independent variable is a discrete variable at a dichotomous nominal level (Ritchey, 2008). The t-test is carried out separately for each category; it is important to explain that there will be more opportunities to find significant differences between groups by comparing groups on several variables.

Table IV Means and Standard Deviations, Study Variables

Variables	Managerial		Professional	
	M	SD	M	SD
Techno-Overload	3.352	0.286	3.393	0.338
Techno-Invasion	2.804	0.495	3.333	0.357
Techno-Complexity	3.393	0.295	3.432	0.294
Techno-Insecurity	3.420	0.301	3.402	0.268
Techno-Uncertainty	3.403	0.305	3.348	0.297

Source: Authors, N = 119

Specifically, the purpose of the normality test as part of the classical assumption test is to ensure that the data obtained has a normal distribution, meaning that there are no errors in the distribution of the data such that the data become unsuitable for use. The importance of data normality is that the results of the research can be generalized to the object of the research. Before carrying out the t-test, the normality test was carried out using the Kolmogorov-Smirnov test and the Shapiro-Wilks test (Green, S. B., Salkind, 2014). The results of the Kolmogorov-Smirnov test are described in the table, and the results of the Shapiro-Wilks test are presented in table 4 following. The Kolmogorov-Smirnov table indicates that all variables are normal except for managerial techno-overload and managerial techno-invasion.

Table V Normality Test of Kolmogorov-Smirnov

Variabel	WORKER	Kolmogorov-Smirnov[a]		
		Statistic	df	Sig.
Techno-Overload	Managerial	0.100	58	0.200*
	Professional	0.106	61	0.083
Techno-Invasion	Managerial	0.098	58	0.200*
	Professional	0.201	61	0.000
Techno-Complexity	Managerial	0.157	58	0.001
	Professional	0.115	61	0.043
Techno-Insecurity	Managerial	0.121	58	0.035
	Professional	.155	61	.001
Techno-Uncertainty	Managerial	.148	58	.003
	Professional	.183	61	.000

Source: Authors, N=119

Meanwhile, through the Shapiro-Wilks test, it is known that the dependent variables, namely Techno-Overload, Techno-Complexity, Techno-Insecurity, and techno-uncertainty, have a normal distribution where the significance value is less than 0.05. On the other hand, the Techno-Invasion variable in the managerial group has a significance value greater than 0.05, which means that this variable does not have a normal distribution and does not meet the requirements for parametric testing. Based on the results of the normality test, it is known that the normal assumptions for the research data cannot be met because not all variables have a normal distribution. This is because one data group, namely workers at the managerial level, does not reach 50% (management-level workers, 48%). Thus, to overcome this, non-parametric statistical testing is used, namely the Mann-Whitney U Test.

The Mann-Whitney U test null hypothesis (H0) aims to identify that the two groups being studied come from the same population. In other words, this test establishes that the two independent groups are homogeneous and have the same distribution. Specifically, the two variables in this study correspond to the two groups represented by two continuous cumulative distributions, which are hereinafter referred to as "scholastically equal."

Table VI Normality Test of Shapiro-Wilk

Technostress	Worker	Shapiro-Wilk		
		Statistic	df	ρ
Techno-Overload	Managerial	0.954	58	0.028
	Professional	0.946	61	0.009
Techno-Invasion	Managerial	0.977	58	0.348
	Professional	0.891	61	0.000
Techno-Complexity	Managerial	0.913	58	0.000
	Professional	0.960	61	0.044
Techno-Insecurity	Managerial	0.955	58	0.029
	Professional	0.906	61	0.000
Techno-Uncertainty	Managerial	0.896	58	0.000
	Professional	0.939	61	0.005

Source: Authors, N = 119

The first hypothesis states that H1: There is a difference in techno-overload between managerial and professional-level workers. In testing this hypothesis, the independent sample t-test was used. The t-test is carried out if the dependent variable is a continuous variable by nature and the independent variable is dichotomous and at a discrete nominal level. Based on the results presented in Table 6, it is known that there is no significant difference in the level of technostress in the Techno-Overload category between workers at the managerial level and professional workers ($t = -2.016$, $p = 0.987$). Furthermore, based on Levene's test for the level of homogeneity, it is known that the data variance is homoscedastic ($F = 0.000$, $p = 0.987$). Furthermore, from the results of the Lavene test, it is also known that the p-value is smaller than 0.05, which indicates that the variance of the two groups of observations does not have a significant difference in technostress as measured by Techno-Overload for managerial-level workers and professional workers.

Table VII The Independent Sample T-Test

Technostress	Managerial		Professional		T	ρ
	M	SD	M	SD		
Techno-Overload	3.352	0.286	3.393	0.338	-2.016	0.987
Techno-Invasion	2.804	0.495	3.333	0.357	0.306	0.063
Techno-Complexity	3.393	0.295	3.432	0.294	-0.725	0.662
Techno-Insecurity	3.420	0.301	3.402	0.268	0.334	0.362
Techno-Uncertainty	3.403	0.305	3.348	0.297	1.003	0.735

Source: Authors, N=119

The formulation of the second hypothesis states that H2: There is a difference in techno-invasion between managerial and professional-level workers. Based on the results presented in table 7, it is known that the value of t is 0.306 and the value of p is 0.760. This value indicates that there is no significant difference in the level of technostress in the Techno-Invasion category between workers at the managerial level and professional workers. Furthermore, based on Levene's test for the level of homogeneity, it is known that the data variance is homoscedastic ($F = 0.000$, $p = 0.760$). Furthermore, from the results of the Lavene test, it is also known that the p-value is greater than 0.05, which indicates that the variance of the two groups of observations is not significantly different.

The third hypothesis (H3) in this study formulates H3: there is a difference in techno-complexity between managerial and professional-level workers. The t-value is -0.725 and the p-value is 0.470 as of the day the hypothesis was tested using the independent sample t-test. These results indicate that the H3a

hypothesis in this study is rejected and that the H3b hypothesis is accepted, where there is no difference in Techno-Complexity between workers at the managerial level and professional workers during the COVID-19 pandemic. Furthermore, based on Levene's test for the level of homogeneity, it is known that the data variance is homoscedastic (F = 0.192, p = 0.470). Based on the results of the Lavene test, it is also known that the p-value is greater than 0.05, which indicates that the variance of the two groups of observations is not significantly different.

Table VIII Lavene's Test for Equality of Variances

Technostress	Lavene's Test		T-Test		
	F	ρ	t	DF	ρ (2-tailed)
Techno-Overload	0.000	0.987	-2.016	117	0.046
Techno-Invasion	3.524	0.063	0.306	117	0.760
Techno-Complexity	0.192	0.662	-0.725	117	0.470
Techno-Insecurity	0.838	0.362	0.334	117	0.739
Techno-Uncertainty	0.115	0.735	1.003	117	0.05536

Source: Authors, N=119

The fourth hypothesis (H4) in this study is to measure differences in technostress levels from the Techno-Insecurity side, which formulates H4: there are differences in Techno-Insecurity between managerial and professional level workers. The t-value is 0.334 and the p-value is 0.739 as of the day the hypothesis was tested using the independent sample t-test. These results indicate that the H4a hypothesis in this study is rejected and that the H4b hypothesis is accepted, where there is no difference in Techno-Insecurity between workers at the managerial level and professional workers during the COVID-19 pandemic. Levene test results for the level of homogeneity also note that the variance of the data is homoscedastic (F = 0.838, p = 0.739), which also indicates that the p-value is greater than 0.05, where the variance of the two groups of observations is not significantly different.

The fifth hypothesis states that H5: There is a difference in techno-uncertainty between managerial and professional-level workers. Through the independent sample t-test in Table 6, it is known that there is no significant difference in the level of technostress in the Techno-Uncertainty category between workers at the managerial level and professional workers (t = 1.03, p = 0.318). Furthermore, based on Levene's test for the level of homogeneity, it is known that the data variance is homoscedastic (F = 0.115, p = 0.318). Furthermore, from the results of the Lavene test, it is also known that the p-value is greater than 0.05, which indicates that the variance of the two groups of observations is not significantly different.

Since the results of testing the assumptions of Shapiro-Wilks and Kolmogorov-Smirnov showed an abnormal data distribution, non-parametric statistical tests were also carried out using the Mann-Whitney U Test. In the table, it is known that the average ranking of the Techno-Overload, Techno-Invasion, Techno-Complexity, and Techno-insecurity" for workers in the managerial group is lower than the average for professional workers. Meanwhile, on the Techno-Uncertainty variable, the average value of managerial workers is higher than that of professional workers. In the indicator of significant value or p-value, it is known that only Techno-Invasion has a p-value of less than 0.05, while other technostress variables have a p-value greater than the critical limit of 0.05. This indicates that in the variables Techno-Overload, Techno-Complexity, Techno-Insecurity, and Techno-Uncertainty there is no difference in the level of technostress between workers who are at the managerial level and professional workers. On the other hand, on the Techno-Invasion variable, it is known that there are differences in the level of technostress between workers at the managerial level and professional workers (H1 is accepted).

Table IX Mann-Whitney U Test

Variables	Managerial	Professional	Z	p
	Mean Rank	Mean Rank		
Techno-Overload	57.38	62.49	-0.813	0.416
Techno-Invasion	41.75	77.35	-5.669	0.000
Techno-Complexity	57.45	62.43	-0.791	0.429
Techno-Insecurity	59.79	60.20	-0.064	0.949
Techno-Uncertainty	62.84	57.30	-0.886	0.375

Source: Authors, N=119

Based on the results of the Mann-Whitney U Test, it is known that there are different levels of technostress among managerial workers and professional workers in terms of Techno-Invasion. In professional workers, the technology used during the COVID-19 pandemic has violated their privacy and personal lives. These results are in line with research conducted by Tarafdar on how technology will intertwine their personal lives and professional work (Tarafdar, M., Pullins, E. B., Ragu-Nathan, 2015; Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., Ragu-Nathan, 2007). If this happens continuously, it will create tension and stress for the worker (Mawhinney, 2014). From the results of the questionnaire, it was also known that respondents felt more tired, emotionally drained, and had sleep disturbances due to the massive use of technology during the COVID-19 pandemic.

Conclusion

Technostress because of the immediate and massive use of information technology during the COVID-19 pandemic must be identified specifically at each level of work and profession. Different types of work and managerial levels within an organization encourage different levels of technostress. By examining the different levels of technostress at each level of work and profession, appropriate strategies and policies can be formulated to reduce stress levels at each level of work and profession. Based on the research results, it is known that the level of technostress experienced by workers differs between workers at the managerial level and professional workers from the Techno-Invasion perspective.

For workers at the managerial level, the change in work model to working from home with the help of technology disrupts their personal lives. There is a change in the work system from being conventional in the office to working from home, causing workers to always be connected to technology and disrupting their personal and family time. In this case, workers must always submit and send their work outside of their working hours and during their holidays. This phenomenon causes workers to feel that there are no more boundaries between personal life and work, so they experience stress and frustration. On the other hand, for professionals, the use of technology during a pandemic is not a significant problem. Previously, professional workers were accustomed to flexible working hours and could always be connected anywhere, so they didn't feel pressured to use technology during a pandemic.

Acknowledgment

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