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Risk of overusing mobile phones: Technostress effect

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Abstract

Technostress is defined as the stress derived from the use of information technology. Prior researchers have studied this phenomenon in many situations such as in the work environment, concentrating on the effect of technostress on the individual who overwhelmed by the use of information technology on his/her job. In this study, we attempt to examine consequences of continuously overusing mobile phone which lead to technostress. Drawing from the stress-strain-outcome model of stress, we proposed that overusing mobile phone can lead to technostress, whereas technostress will cause problems in personal health and work-related issues. Results from surveying 400 working professionals provide a support for our proposed model.

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1. Introduction

In working environment, mobile devices engagement is where “individuals stop interacting with someone they are with in person in order to interact with someone on the other end of a mobile phone has become common”¹. When users over manipulate such devices, they can unconsciously create stress. In fact, people are well familiar with the word of stress but this technology usage can also create another kind of stress called “Technostress”. Regarding technostress, it can affect users in many ways, such as users’ physical, emotional, and productivity at work. Users

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may become distracted and their job performances may be weakened². Other people may perceive such behavior as impolite¹. In addition, such behavior may also cause a stress and a long-term effect on people health.

Although topics on effects of overusing Mobile phones become important, there are only a few studies focusing on consequences of overusing such mobile technologies. Some technostress studies involving individuals focus exclusively on immobile technologies^{3,4}. Others have studied the effect of immobile and mobile technologies on individual and organization outcomes⁵. However, little attention is being paid to a general understanding of the influence of mobile technologies on users^{6,7}. Therefore, the objective of this study is to propose a conceptual model to understand the impact of technostress on people in their working environment and explore the effect of overusing mobile phone on the productivity, efficiency, and health of employees.

2. Model Development

There are a number of research evidences illustrated that stress can be originated by the use of information technology directly and indirectly^{8,9,10}. In this section, we base our study on the stress-strain-outcome model proposed by Koeske and Koeske¹¹. Based on this model we present a conceptual model for the outcome of technostress caused by overusing mobile phone in working environment.

In fact, the theoretical foundation of the Stress-Strain-Outcome Model followed the three-layered stress-strain-outcome model¹¹. This model shows how stressors become noticeable in an individual's life. The model utilizes three variables: stress, strain, and outcome. In addition, the model suggests a direct influence of stressors on strain, while the strain is actually a contributing factor for distinct outcomes.

The stress-strain-outcome model uses stressors as stimuli of an individual's environment that are perceived as irritating, troublesome, or disruptive. Stress in this model is defined as “adverse feelings, such as anxiety, fear, irritation, pressure, and sadness that are caused by an imbalance between individual's motivations and abilities and the environment's requirements and supports”¹². The stress-strain-outcome model suggests strain as an outcome of perceived stressors and as an antecedent of outcome variables. Prior studies on stress suggest job satisfaction, organizational commitment, and individual differences as interesting outcome variables⁴. Tetrick et al. (2000) used this stress-strain-outcome model and suggest emotional exhaustion as strain variable mediating the influence of stressors such as overload or workload on the outcome variable¹³. In this study, stress, strain, and outcome variables are transferred into the context of overusing technology, technostress, and outcome variables, health and personal work-related issues. The concept of the stress-strain-outcome model is illustrated below (see Fig. 1).

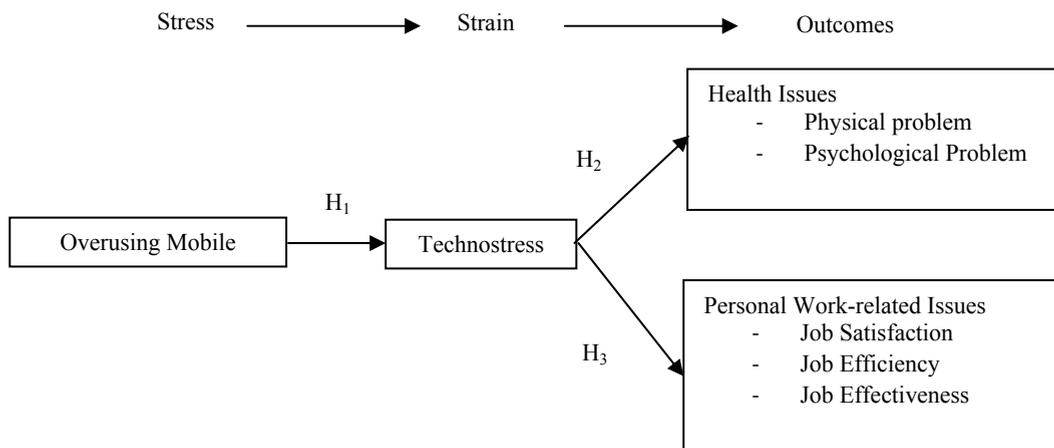


Fig 1. The conceptual model of technostress.

2.1. Stress: Overusing Mobile Phone

Certain technology characteristics such as usability, intrusiveness, and dynamism are related to stressors⁵. They stated that these stressors should be controlled for technology usage. When individuals become more dependent on technologies (i.e., increasing technology usage), they experience higher levels of stressors. That is, when technology usage increases, there are greater chances in which technology could enhance the stressors. Tarafdar et al. (2007) use concepts from sociotechnical theory and role theory to examine the effects of stress created by ICT called “technostress” on role stress and on individual productivity³. They explained how ICTs can create stress in users and identify factors that create technostress. The study concluded that (1) technostress is inversely related to individual productivity; (2) role stress is inversely related to individual productivity; and (3) technostress is directly related to role stress.

2.2. Strain: Technostress

A potential consequence of perceived stress is a strain¹⁴. Strain is defined as psychological reaction to successful situations¹⁵. Strain can be defined as “burnout”, which is the deep emotional exhaustion that may occur when providing services to others requires intense involvement in their lives¹¹. When humans interact with mobile technology, there are several potential negative outcomes such as mobile stress, mobile anxiety, negative mobile technology attitudes, mobile phobia, and mobile aversion. Other outcomes can be a decreasing behavioral intention, a preference for staying at home from work, poor job performance, or an increased turnover intention¹⁶. If user cannot control his/her mobile technology usage, technostress will occur¹⁷. Mobile communication tools such as laptops and smart phones have made it routine for employees to simultaneously handle different streams of information from both internal and external sources⁴. This can cause communication and information overload. In addition, it may create stress and leave users very frustrated and dissatisfied. The stressor such as overusing mobile phone in the work place can create multitasking, information overload, and wasting work time. Furthermore, using mobile devices without resting or relaxing or using several applications at once on mobile devices can cause application crashes, network signal failure, obsolescent of software/applications. These are major factors cause technostress. Based on the fact that stressors affect strain¹¹ and overusing mobile phone is identified as such a stressor, we assume that:

H1: Overusing mobile phone is positively related to technostress.

2.3. Outcomes: Health and Personal Work-related Issues

The existing literatures reported that uses of technology have differential effects on various aspects of performance¹⁸. Therefore, it is important to examine the impact that technostress might have on outcome relating to overusing mobile phone. According to prior research^{3,19}, technostress can affect health issues, either physical health or psychological health. Physical health problem is defined as anything that has to do with users' bodies as a physical entity. When individual uses mobile phone for internet browsing, texting, or email, such activities can cause eyestrain and sleep disturbance, headache from learning to use new device and exhaustion from a need to update technology all the time.

Mahalakshmi and AllySornam (2013) suggested that regular breaks must be taken when any persons work with computers for a long period²⁰. Thomee et al. (2011) illustrates a psychosocial aspect of mobile phone usage and mental health symptoms in a prospective group of young adults²¹. By conducting a longitudinal study on mobile phone exposure and mental health, they found that mobile phone usage can become a risk factor for mental health among young adults.

Psychological health is a state of emotional and psychological well-being in which an individual is able to use his or her cognitive and emotional capabilities, function in society, and meet the ordinary demands of everyday life. The example of psychological health is anger, anxiety, depression, inability to cope, frustration, indecisiveness, lack of concentration, loss of confidence. Therefore, it is hypothesized that:

H2: Technostress is positively related to health issues.

H2a: Technostress is positively related to physical health.

H2b: Technostress is positively related to psychological health.

In working environment, using mobile phone while working can result in multitasking and cause technostress that can lead to poor job performance. Similarly, technostress can also effect to users' satisfaction. Lukoff and Gackenbach (2004) mentioned that some individuals use the Internet in dysfunctional ways that lead to social isolation and deteriorating work performance²². If technostress accounts for more stress on a more general level, we expect this form of general stress to influence organizational outcomes in the form of a decreased job satisfaction.

Job satisfaction is defined as "a pleasure or positive emotional state resulting from the appraisal of one's job and job experiences"²³. It has been studied extensively as a behavioral outcome variable in the current stress literature. Bhattacharjee (2001) suggests that an individual's satisfaction is the most essential influencing factor for continuous usage, because it determines the willingness to repeat certain behaviors²⁴. However, in the mobile phone context, individuals voluntarily bring their mobile devices to help them deal with work settings. As a result, they feel satisfied with their job by using such mobile technology. In contrast, mobile technology has also created other problems than frequently influence individuals, such as a work interruption². On a negative side, low satisfactions increase the probability of stopping to repeat the behavior. Therefore, the relationship between mobile technology usage and job satisfaction is still unclear, which is why further study is needed. The stress-strain-outcome model suggests that strain has an influence on outcome variables. Work related research argues that strain becomes obvious in a psychological and behavioral manner²⁵. Therefore, satisfactions can represent as an outcome of psychological strain.

In recent years, the usage of communication technologies has rapidly increased in the working environment². This gives more opportunities to generate more stress for employees in the work-place. Employees become more stressed when they use mobile technologies. The increased stress can thereby affect the completion of work, or even increase the job stress. They found that there is an inverse relationship between technostress and productivity. As technostress increases, productivity decreases. Hayashi (2011) also studied the relationship between technostress and productivity²⁶. The study suggested that an organization should reduce work-related stress which in turn could increase productivity. When an organization can control work-related stress, it can affect firm productivity. Saganuwan et al. (2013) suggested that technostress is an important phenomenon that has impact on job satisfaction and job performance²⁷. For problems on job performance, individuals are forced to pay more attention to mobile technology to avoid missing any information or communication, which may threaten their job performance. Based on this, we hypothesize that:

H3: Technostress is positively related to personal work-related issues.

H3a: Technostress has a positively influence on job satisfaction.

H3b: Technostress has a positively influence on job efficiency.

H3c: Technostress has a positively influence on job effectiveness.

3. Methodology

This study explores the relationship between technostress, health and personal work-related issues. In health issues, we explore two aspects of health issues which are physical and psychological problems. For personal work-related issues, we examine job satisfaction, job efficiency and effectiveness. The desired samples for our study are individuals who use smartphones. The other creators of technostress in personal sphere are beyond the scope of this study (such as computer or tablet usage). Since the emphasis is on developing causal relationships, empirical data were collected through questionnaire survey methodology. Multiple items were used to measure each construct.

3.1. Questionnaire Design

The research design of the proposed research work is descriptive in nature. An initial list of items for the questionnaire was generated based on literature review. All items in the questionnaire are measured on a 5-point

Likert type scale, with 1 indicating “strongly disagree” and 5 indicating “strongly agree”. Respondents were asked to mark the appropriate number to indicate the extent to which he/she agreed or disagreed with each statement. We conducted a pilot study with a sample size of 30 mobile phone users. We applied measures to construct validity to ensure instrument validity during the analysis of the data. Reliability score (Cronbach's alpha) was used to assess scale consistency.

3.2. Data Collection

We conducted a survey to collect data and then tested our research model. Since this study attempts to examine the impact of technostress on individuals, the samples are not constrained to any particular occupation. The respondents were requested to ask for the questionnaire if they were interested in participating, and to return the completed questionnaire in a sealed envelop. Respondents we informed that participation in the study was voluntary and that the confidentiality of their responses was assured. The survey was distributed to a random sample of 400 people who use mobile phone regularly. However, only 346 users took part in the study, which corresponds to a response rate of about 86.5 percent. The sample is highly dominated by females, 62.7 percent. Most of them are well educated. 41 percent of the respondents were students. In addition, almost all respondents use smartphones, 89.9 percent.

3.3. Data Analysis and Results

In order to examine the model, regression analysis was performed to test the relationship among mobile phone usage, technostress, health and personal work-related issues. Model 1 shows the relationship between mobile phone usage and technostress. The coefficient of determination and significance levels of each path coefficient are used. The result shows that the coefficient of model 1 is equal to 0.680 with the Adjusted R square equals to 0.461 and Durbin Watson is 2.110. That is, overusing mobile phone alone does have a significant positive relationship with technostress.

For Model 2a, we used technostress as an independent variable and physical health as a dependent variable. The beta coefficient is equal to 0.542 with the adjusted R square equals to 0.292. The results show a relationship between technostress and physical health. The value of Durbin Watson is similar to mental health which is equal to 2.032.

Then, we examined the relationship between technostress and psychological health (Model 2b). We used technostress as independent variable and specified psychological health as dependent variable. The result shows that the Beta coefficient is equal to 0.595 with the adjusted R square equals to 0.353. That means, our model shows a positive relationship between technostress and psychological health. The value of Durbin Watson is 2.051.

When we analyzed the effect of technostress on personal work-related issues (Model 3), we found that the Beta coefficient is equal to 0.630 with the Adjusted R square equals to 0.395. The value of Durbin Watson is 1.822. It means, technostress has a positive relationship with personal work-related issues.

For Model 3a. the beta coefficient is equal to 0.458 with the Adjusted R square equals to 0.207. The value of Durbin Watson is 1.782. It means, technostress has a weak impact on job satisfaction.

Model 3b determines the relationship between technostress and job efficiency. The relationship is investigated by looking at the Beta coefficient which is equal to 0.484 with the Adjusted R square equals to 0.232. The value of Durbin Watson is 1.953. That is, technostress does have the direct and weak impact on job performance.

Lastly, Model 3c explains the relationship between technostress and job effectiveness. The results show that Beta coefficient is equal to 0.314 with the Adjusted R square equals to 0.096. We cannot conclude that technostress has an impact on job effectiveness. The value of Durbin Watson is 1.898.

4. Discussion

After we analyzed the data and tested our model, the results show the relationship between overusing mobile phone and technostress. Overusing mobile phone can lead to higher degree of technostress. Consequently, we examine the effect of technostress on health and personal work-related issues. For health issues, such as a physical

symptoms and psychological symptoms, we found that technostress has a positive impact on human health. It is easy for employees to appear burnout if they use mobile technology over long periods of time, which creates technostress. When we analyzed health issues by classified them into either physical or psychological health problems, the results of physical health show that technostress can affect physical health. The users who are affected by technostress can suffer from physical problems such as neck pain, shoulder pain, eyestrain, and sleeping disorder causing from overusing mobile phone. Our results also suggest that technostress can affect psychological health. The users may feel isolated, so they use mobile phone to talk to others and also get irritated if someone deprived their mobile phone. Then, we tested the relationship between technostress and personal work-related issues, including job satisfaction, job efficiency, and job effectiveness. Our results show that technostress can affect person's job satisfaction and performance. When technostress occurs, workers may feel less satisfy on their works. In some cases, worker may not enjoy a good relationship with their colleagues. Technostress can also lower workers job efficiency. For example, workers are not able to concentrate on works as the level of technostress increases. Therefore, they cannot finish their tasks on time or without making any mistake. Although technostress has a positive effect on job efficiency, we found no significant effect on job effectiveness. For instance, they may not able to accomplish their goals.

5. Conclusion

This study aims at exploring the technology-induced stress called “technostress”, and present the effect caused by technostress. We found that when users spend too much time on mobile phone, technostress can occur. When we examined the effects of technostress on health issues, including physical and psychological symptoms, both aspects can be affected by technostress. As technostress increases, physical and psychological symptoms could occur. In addition, we then examined an impact of technostress on personal work-related issues, which are job satisfaction, job efficiency, and job effectiveness. We also found that technostress has an impact on personal job satisfaction and performance, but not on job effectiveness.

The results clearly indicated that overusing mobile phone can create technostress and also has a negative impact on health and personal work-related activities. If the users spend too much time on mobile phone, they can suffer from both physical and psychological health problems. In the working environment, technostress also has the impact on works. When workers feel stressed from overusing mobile phone, they will less satisfy with their jobs and can cause poor job performance. This stress can also affect personal issues such as job satisfaction and job efficiency.

Our finding reinforces that the absence of adequate technostress prevention mechanisms for employees can lead to undesirable consequences not in line with anticipated benefits. In addition, this study also enhances our knowledge on the phenomenon of technostress. In health issues, users should adjust their own behaviors on smart phone usage. Such inappropriate behavior can lead to many problems such as ergonomics concerns in lighting, noise, and posture. These factors can contribute to developing psychological pressure. Inside the organization, technostress can affect employee's satisfaction and their job performance. For future study, we should observe the duration people can spend on using mobile phone safely. Lastly, this study could present a useful avenue for firms to evaluate task and technology context proactively in order to reduce technostress.

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