THE RELATIONSHIP BETWEEN TECHNOSTRESS, PSYCHOLOGICAL HEALTH AND PHYSICAL HEALTH AMONG TECHNOLOGY USERS

NURDALILA BINTI ABDULLAH

UNIVERSITI TEKNOLOGI MALAYSIA

THE RELATIONSHIP BETWEEN TECHNOSTRESS, PSYCHOLOGICAL HEALTH AND PHYSICAL HEALTH AMONG TECHNOLOGY USERS

NURDALILA BINTI ABDULLAH

A dissertation submitted in partial fulfilment of the
requirements for the award of the degree of
Master of Science (Human Resource Development)

Faculty of Management
UniversitiTeknologi Malaysia

SEPTEMBER 2014

To my beloved father, mother, siblings and friends

ACKNOWLEDGEMENT

In preparing this dissertation, I was in contact with many people who have contributed towards my understanding and views. First of all, I would like to extend my deepest gratitude to my supervisor, Dr. Norashikin binti Mahmud, for valuable guidance, critics and encouragement. I would have not able to present my thesis as presented here without his continuous motivation and advices. I received motivation and support from all my friends (Hakimi, Syadila and Shiraz) in the field of Human Resource Development. I am very grateful to my parent (En. Abdullah bin Mamat and Pn. Siti Bariah binti Ali), who has provided full support and encouragement in completing my studies. Also, not forgetting my siblings (Nurdiyana, Nurwahidah, Nur Shahirah and Nurul Shafiqah) who support me with their love and blessings.

.

ABSTRACT

This study intends to examine the relationship between technostress and psychological health (psychological distress, cognitive symptoms and sleep disturbance) and physical health (musculoskeletal discomforts and eyestrain) among technology users at UiTM Jengka Branch. In order to achieve these objectives, a set of questionnaire consisted of instruments by Goldberg (1997), Copenhagen Psychological Questionnaire, Karolinska Sleep Questionnaire, Kuorinka (1987) and Watt (2003) was used. Questionnaire was given to representatives of the organization to be distributed to respective respondents. Out of 300 distributed questionnaires, only 219 (73%) questionnaires were return. Descriptive analysis results showed that the level of technostress, psychological health and physical health among technology users was at a moderate level. Results from Pearson correlation and multiple regression analysis showed that, technology insecurity significantly correlated and is the most influential variable that has an effect on psychological health. However, there is no significant effect between technostress and physical health.

ABSTRAK

Kajian ini dijalankan bertujuan untuk mengkaji hubungan di antara tekanan teknologi, kesihatan psikologikal (kesusahan teknologi, gejala kognitif dan gangguan tidur) dan kesihatan fizikal (ketidakselesaan otot dan ketegangan mata) di kalangan pengguna teknologi di UiTM Cawangan Jengka. Untuk mencapai objektif kajian yang telah ditetapkan, satu set soal selidik yang terdiri daripada instrument oleh Golberg (1997), Borang Soal Selidik Psikologikal Copenhagen, Borang Soal Selidik Tidur Karonlinska, Kuorinka (1987) dan Watt (2003). Borang soal selidik telah diberikan kepada wakil organisasi untuk diedarkan kepada responden. Daripada 300 soal selidik yang diedarkan hanya 219 (73%) soal selidik berjaya dikumpul. Hasil analisis deskriptif mendapati bahawa tahap teknostres, kesihatan psikologikal dan kesihatan fizikal di kalangan pengguna teknologi adalah berada pada tahap sederhana. Ujian kolerasi Pearson dan regresi berganda menunjukkan bahawa ketidak-selamatan teknologi merupakan faktor yang paling mempengaruhi dan mempunyai hubungan dengan kesihatan psikologikal. Walaubagaimanapun, tiada kesan signifikan antara tekanan teknologi dan kesihatan fizikal.

TABLE OF CONTENT

CHAPTER	TITLE	PAGE
	DECLARATION	**i**
	DEDICATION	**ii**
	ACKNOWLEDGEMENT	**iii**
	ABSTRACT	**iv**
	ABSTRAK	**v**
	TABLE OF CONTENT	**vi**
	LIST OF TABLES	**xi**
	LIST OF FIGURE	**xiii**
1	**INTRODUCTION**	**1**
	1.1 Introduction	1
	1.2 Background of Study	2
	1.3 Problem Statement	5
	1.4 Research Questions	8
	1.5 Research Purpose	9
	1.6 Research Objectives	9
	1.7 Research Hypothesis	10
	1.7.1 Psychological Health	10
	1.7.2 Physical Health	10
	1.8 Scope of the Study	10
	1.9 Research Significance	11
	1.9.1 Organization	11
	1.9.2 Employees	11
	1.9.3 Future Researchers	12
	1.10 Research Limitation	12
	1.11 Conceptual Definitions and Operational	13

	Definitions	
	1.11.1 Technostress	13
	1.11.2 Psychological Health	13
	1.11.3 Physical Health	14
	1.12 Conclusion	14
2	**LITERATURE REVIEW**	**15**
	2.1 Introduction	15
	2.2 Stress and Health	16
	2.3 Technostress	18
	2.3.1 Technostress Dimensions Model	20
	2.3.2 Dimensions of Technostress	22
	2.3.3 Technostress Model (PE Fit Model)	25
	2.4 Technostress and Psychological Health	27
	2.4.1 Model of Psychological Health (ERTSM Model of Worker's Mental Health)	28
	2.4.2 Relationship between Technostress and Psychological Health Dimensions	30
	2.4.2.1 Relationship between Technostress and Psychological Distress	30
	2.4.2.2 Relationship between Technostress and Cognitive Symptoms	31
	2.4.2.3 Relationship between Technostress and Sleep Disturbance	33
	2.5 Technostress and Physical Health	36
	2.5.1 Model of Physical Health (Karasek's Job Strain Model)	37
	2.5.2 Technostress and Physical Health	39

	2.5.2.1 The Relationship between Technostress and Musculoskeletal Discomfort	39
	2.5.2.2 The Relationship between Technostress and Eyestrain	42
	2.6 Conclusion	45
3	**RESEARCH METHODOLOGY**	**46**
	3.1 Introduction	46
	3.2 Operational Framework	47
	3.3 Research Design	48
	3.4 Data Collection	48
	3.5 Population and Sampling	49
	3.6 Research Instruments	51
	3.6.1 Section A: Demographic	51
	3.6.2 Section B: Technostress	51
	3.6.3 Section C: Psychological Health	52
	3.6.4 Section D: Physical Health	53
	3.7 Pilot Test	56
	3.7.1 Validity	56
	3.7.2 Reliability	57
	3.8 Multivariate Analysis	59
	3.8.1 Normality Test	59
	3.8.2 Linearity Test	61
	3.8.3 Multicollinearity Test	63
	3.8.4 Correlation Test	64
	3.9 Data Analysis Technique	64
	3.9.1 Descriptive Analysis	65
	3.10 Inferential Analysis	66
	3.10.1 Pearson Correlation Analysis	66
	3.10.2 Multiple Regression	67
	3.11 Conclusion	69

4	**DATA ANALYSIS**	**71**
	4.1 Introduction	71
	4.2 Respondents Demographic	72
	4.2.1 Demographic Findings	72
	4.3 Objective 1	74
	4.3.1 Technology Overload	74
	4.3.2 Technology Invasion	75
	4.3.3 Technology Complexity	76
	4.3.4 Technology Insecurity	78
	4.3.5 Technology Uncertainty	79
	4.5.6 Overall Level of Technostress Dimensions	80
	4.4 Objective 2	82
	4.4.1 Psychological Health Dimensions	82
	4.4.2 Overall Level of Psychological Health Dimensions	86
	4.5 Objective 3	87
	4.5.1 Physical Health Dimensions	87
	4.5.2 Overall Level of Physical Health Dimension	89
	4.6 Objective 4	90
	4.7 Objective 5	91
	4.8 Objective 6	93
	4.9 Objective 7	94
	4.10 Conclusion	95
5	**DISCUSSION AND RECOMMENDATIONS**	**98**
	5.1 Introduction	98
	5.2 Discussion of Findings	99
	5.2.1 Discussion on Objective 1: Level of technostress (technology overload, technology invasion, technology complexity, technology insecurity, and technology	99

uncertainty) among technology users.
5.2.3 Objective 2: To identify the level of psychological health (psychological distress, cognitive symptoms and sleep disturbance) among technology users. 102
5.2.4 Objective 3: To identify levels of physical health (musculoskeletal discomforts and eyestrain) among technology users. 104
5.2.5 Objective 4: To identify the relationship between technostress and psychological health among technology users. 105
5.2.6 Objective 5: To identify the relationship between technostress and physical health among technology users 106
5.2.7 Objective 6: To identify the most dominant technostress dimension that influence psychological health among technology users. 107
5.2.8 Objective 7: To identify the most dominant technostress dimension that influence physical health among technology users. 108
5.3 Contribution of Study 109
5.4 Limitations of Study 110
5.5 Recommendations 111
5.5.1 Recommendations to Future Research 111
5.5.2 Recommendations to Organization and Technology Users 112
5.6 Conclusion 114

REFERENCE **116**

APPENDIX **138**

LIST OF TABLE

TABLE NO.	TITLE	PAGE
3.1	Likert Scale	54
3.2	Questionnaire Distribution	55
3.3	Cronbach Alpha Coefficient	57
3.4	Research Instrument Reliability Result	58
3.5	Multicollinearity Test	63
3.6	Pearson Correlation Result	64
3.7	Mean Score and Mean Value	65
3.8	Classification of Pearson Correlation Values (r)	67
3.9	Statistical Method Summary	69
4.1	Respondent Demographic Characteristic	73
4.2	Descriptive Statistics for Technology Overload	74
4.3	Descriptive Statistics for Technology Invasion	76
4.4	Descriptive Statistics for Technology Complexity	77
4.5	Descriptive Statistic for Technology Insecurity	78
4.6	Descriptive Statistics for Technology Uncertainty	80
4.7	Descriptive Statistics of Overall Level for Technostress	81
4.8	Descriptive Statistics for Psychological Distress	83
4.9	Descriptive Statistics for Cognitive Symptoms	84
4.10	Descriptive Statistic for Sleep Disturbance	85

4.11	Descriptive Statistic Overall Dimension of Psychological Health	86
4.12	Descriptive Statistic for Musculoskeletal Discomforts	87
4.13	Descriptive Statistic for Eyestrain	88
4.14	Overall Level of Physical Health Dimension	90
4.15	Correlation Analysis of Relationship between Technostress and Psychological Health Dimensions	91
4.16	Correlation Analysis of Relationship between Technostress and Physical Health Dimensions	92
4.17	Analysis Regression for Technostress Dimensions and Psychological Health	94
4.18	Analysis Regression for Technostress Dimensions and Physical Health	95
4.19	Summary of Research Objective Achievement	96

LIST OF FIGURE

TABLE NO.	TITLE	PAGE
2.1	Technostress Dimensions Model	21
2.2	Theory of Person- Environment (PE) Fit	26
2.3	ERTSM Model of Worker's Mental Health	28
2.4	Karasek's Job Strain Model	37
2.5	Musculoskeletal Discomfort Body Part among Employees	40
2.6	Factors that Eyestrain	43
2.7	Conceptual Framework	45
3.1	Operational Framework	47
3.2	Normal P-P Plot of Technostress and Psychological Health	60
3.3	Normal P-P Plot of Technostress and Physical Health	60
3.4	Scatter Plot for Psychological Health	62
3.5	Scatter Plot for Physical Health	62
3.6	Multiple Regression Manual Calculation	68

LIST OF APPENDIX

APPENDIX	TITLE	PAGE
A	Questionnaire	138

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter will explain the background of the study and problem of statement of the study conducted. In addition, this chapter will explain the research objectives and the significance of the research to be acquired as a result of this study. Furthermore, the conceptual and operational definitions also will be explained further. There are several limitations inherent in this study will be a useful guide to researchers in the future.

1.2 Background of the Study

Nowadays the uses of technology in doing work have increased, not restricted to computer only but also gadgets such as Smartphones (iPhone, Blackberry, and so on), PC's tablet (iPad, Galaxy tab and so on), laptops and the Internet. Apart from that, the technology nowadays can be used to install PC-like operating system (OS) together with various applications (applied program) and it also can be use to surf the Internet and makes the users' life becoming comfortable and make their work easier (Choi, *et. al*, 2011).

According to Internet World Statistics (2012) the technology users in Malaysia were around 17.7 million in 2012 compared with 3.7 million in 2000. The statistic shows the importance of technology has grown in our lives and has affected society positively by giving them new options and had been helped in changing their ways and reasons of works (Heissen, 1987; Hulbert, 1998). Furthermore, technology has become a compulsory thing in the daily activities of their users. The technology such as e-mail, internet and fax have been adjusted in accordance with their work so that, the users can perform their official duties faster (Cohn, 2000).

Thus, the effects of improved technology were also clearly visible by its users. As we known, technology has widely spread and it had been used by technology users everywhere throughout the modern society (Shami, 2008). Even though, they seem to be necessary, however it was impossible for most people to accomplish their workplace tasks without this technology (Frances & Simeon, 2011). They like it or not they need to adapt with the rapid changes in the technology (Sami & Pangganaiah, 2006).

Consequently, if the technology users cannot adapt with technological changes, the technology users will face the high workload, need to be more productive and need to work overtime compare with the one that can adapt it easily (Riedl, *et. al*, 2011). Besides, the employers can easily contact the employees using the technology such as e-mail, Short Messaging Service (SMS), Instant Messenger (IM), Blackberry Messenger (BBM) and other technology form and assign them with more work (Tiemo and Ofua, 2010).

Furthermore, technology users also will have the anxious feeling towards their colleagues with a better technological understanding (Brillhart, 2004). They also worried that other people will replace them if they cannot adapt to the new technology trend that keeps on changing and more complex day by day. They also will feel that their skills are not good enough and they will spend time and effort to learn the technology which is good for the organization. As the result, the technology users' uncertainty on psychological health and physical health will be increased (Tu, *et. al*, 2005).

However, working with technology can sometimes be stressful. Selye (1956) states that stress in unavoidable in life and no individual will spare from stress. Much of our stress in life comes from conflicts and interpersonal difficulties we encounter with other people. The stress that cause by the technology was called as technostress and it is also known as technophobia, cyber phobia, computer-anxiety and also computer stress (Caro & Sethi, 1985). The concept of technostress was introduced by Brod (1984). He defined technostress as a modern disease of variation caused by an inability to handle the new technology in a healthy manner. There are many types of technology related conflicts and stress could arise at any of these conflicts (Ibrahim, *et. al*, 2007).

Thomée *et. al* (2011) mentioned that there is the relationship between technostress and psychological health. She indicated that, the amount of time devoted to the used of technological devices was the central problems. Regarding those most at risk among the technology users, Thomee wrote that the intensive used of technology will lead them to time pressure, neglect of other activities, personal needs, bad ergonomics and also mental overload. Kosker (2013) supported that intensive used of technology can dramatically increase the risk of psychological health such as depression and insomnia. Chiba University of Japan investigated that the effects of hazards of technology, especially computers in the workplace has concluded that it can damage psychological health. Besides, Ekman *et al* (2000) found that technology use also associated with psychological and physical health. Denial, confusion, panic, conflict, anger and fatigue were the example of psychological health caused by technology (Britton, *et. al* 2000). While, according Brillhart (2004) neck pain, back pain and eyestrain is a physical health problem that technology user faced.

In this research, the researcher was focused on the relationship between technostress on the psychological health (psychological distress, cognitive symptoms and sleep disturbance) and physical health (musculoskeletal discomforts and eyestrain) among technology users. Technology users in this research refer to the lecturers. The the lecturers have been choose because the education system in our country has grown with the use of technology as a teaching tool to replace the traditional teach-centered system (Idris and Atan, 2008). The technology was created to have the smart teaching and learning process (Rohini, 2004). Besides the technology used not only limited in the class, but students also used the technology as a tool to communicate with their lecturers after class session (Matkin, 2007).

1.3 Problem Statement

Technostress is becoming a hot topic recently. According to Britton *et. al* (2000) the negative impact of technostress have been documented on librarians and library users, executive, manager and patrons. Technostress also documented on teachers and lecturer (Riley, 2010). He also emphasizes that technology causing education to improve over time and the technology users need to catch up with the trend of educational technology. Over the last few years technology teaching and learning methods have been introduced and the technology usages in this education field have been growing rapidly (Maad, 2009) and it becomes importance in the education institution especially in teaching and learning process.

Nowadays, in Malaysia, teaching and learning in was very different compared with the systems adopted for the last few decades (Besah, 2004). Today, technology has been used in the learning and teaching in all subjects, at the university, college, high school or elementary school level gradually (Wahab *et. al*, 2006). Educators at all levels are trying their best to use technology in teaching and learning process to provide best input to their students. Teaching and learning in Malaysian education system currently is undergoing a very rapid change (Maad, 2009).

Various methods have been introduced and used for educator to be more effective and the learning become easier and fun (Matkin, 2007). Research done by Andin and Ali (2011) proves that the use of technology among educators is high especially in the teaching and learning process. However, not all educators can accept and followed the changes in technology makes by the organization (Hakimi, 2010). Consequently, some of them faced difficulty to accepted new technology in their environment. Moreover, research done by Irshad and Muhammad (2008) 58% of the technology users feel fear phobia and anxious when they cannot adapt with the

technology. This kind of feeling was the negative impact of technology on their psychological and physical health (Rosen and Weil, 1997).

The statistic of psychological health problem in Malaysia documented that the psychological health problem among Malaysian was increased by 15.6% or 400,227 peoples (Ministry of Health, 2012). According to Kadir (2011), the statistic shows that psychological health problem in Malaysian shows the serious problems because it indicated that six people in this country have the mental illness and this will be increased year by year. Furthermore, technostress also have been documented to have psychological health issues such as panic attacked, pressures, cognitive symptoms, distress and also sleep disturbance (Tuettemann and Punch, 2007).

According to Sellgren (2014), more than 38% of educators have seen a rise in psychological health issues in the past two years and 55% of them mentioned that their job had a negative impact on their psychological condition. The statistics also shows that 80% of them were stressed and believed that their job had a negative impact on their psychology. While, 70% believed that they feel exhausted by their work and 65% of them agreed that technology disturbed their sleep at night. In addition, the research done by Honeybourne (2013) shows that psychological health issues involves educator as a high pressured profession. Bousted (2014) emphasize that education professionals do more unpaid overtime than any other group and are put under constant intense pressure to meet targets, with excessive observation and changes in the technology. The technostress not only affected the psychological health of the technology users. A study done by shows that 67% of the technology users also faced the physical health problems Wahab, 2006) due to intensive used of technology.

According to the latest report from consumer research firm Nielsens (2013) the technology used in Malaysia is the third highest in the Asia Pacific and it surpass the developed country like the United States and Europe. Malaysia also recorded a rate of 80% of Smartphone penetration after Hong Kong and Singapore (87%) followed by Australia (75%) and China (71%). The number of technology users keeps on increasing in Asia Pacific especially in Malaysia. The statistic shows that an estimated of 25% to 93% of technology users suffered related to the intensive use of technology such as eyestrain, dry eyes, headache, back pain and neck pain (Cail and Aptel, 2005).

Blix et. al (2004) reported that high job stress was found to be correlated with poor physical health conditions in education area. In addition, according to Odabasi and Eristi (2012), lack of knowledge about healthy technology use and ergonomics cause the physical health problems. Moreover, discomfort associated with high technology use among lecturers is well documented, with increasing concerns about the physical health due to the use of technology (Schulz and Sherwood, 2008). In addition, the research done by The National Health Interview Survey (2009) shows that 49% of the educator in United State of America experiences musculoskeletal discomfort especially neck pain and lower back when they used the technology due to the work. Besides, the statistic also shows that 41% of them experienced eyestrain due to the intensive used of technology.

1.4 Research Questions

1.4.1 What is the level of technostress (technology overload, technology invasion, technology complexity, technology insecurity, and technology uncertainty) among technology users?

1.4.2 What is the level of psychological health (psychological distress, cognitive symptoms and sleep disturbance) among technology users?

1.4.3 What is the level of physical health (musculoskeletal discomforts and eyestrain) among technology users?

1.4.4 What is the relationship between technostress and psychological health among technology users?

1.4.5 What is the relationship between technostress and physical health among technology users

1.4.6 What are the most dominant technostress dimensions that influence psychological health among technology users?

1.4.7 What are the most dominant technostress dimensions that influence physical health among technology users?

1.5 Research Purpose

The main purpose of this study is to identify the relationship between technostress (technology overload, technology invasion, technology complexity, technology insecurity, and technology uncertainty), psychological (psychological distress, cognitive symptoms, sleep disturbance) and physical health (musculoskeletal discomforts and eyestrain) among technology users.

1.6 Research Objectives

1.6.1 To identify the level of technostress (technology overload, technology invasion, technology complexity, technology insecurity, and technology uncertainty) among technology users.

1.6.2 To identify the level of psychological health (psychological distress, cognitive symptoms and sleep disturbance) among technology users.

1.6.3 To identify the level of physical health (musculoskeletal discomforts and eyestrain) among the technology users

1.6.4 To identify the relationship between technostress and psychological health among technology users.

1.6.5 To identify the relationship between technostress and physical health among technology users.

1.6.6 To identify the most dominant technostress dimensions that influence psychological health among technology users.

1.6.7 To identify the most dominant technostress dimensions that influence physical health among technology users.

1.7 Research Hypothesis

1.7.1 Psychological Health

H_1: There is a significant relationship between technostress and psychological distress.

H_2: There is a significant relationship between technostress and cognitive symptoms

H_3: There is a significant relationship between technostress and sleep disturbance

1.7.2 Physical Health

H_4: There is a significant relationship between technostress and musculoskeletal discomforts.

H5: There is a significant relationship between technostress and eyestrain

1.8 Scope of Study

In this study, technology refers to computer, gadgets such as Smartphone, tablets, computers, laptops and also internet. The scope of the study is on the relationship between technostress (technology overload, technology invasion, technology complexity, technology insecurity, and techno-uncertainty), psychological health (psychological distress, cognitive symptoms, sleep disturbance) and physical health

(musculoskeletal discomforts and eyestrain) among technology users. The technology users refer to the lecturers at Universiti Teknologi MARA (UiTM) Jengka Branch. This researcher chooses this respondents because currently, in universities, the lecturers are exposed to new technology, especially computers and also internet (Hassan & Edje, 2009).

1.9 Research Significance

The significance of the study can contribute to the organizations, employees and also to future researchers. Future explanations will explain below:

1.9.1 Organization

This study is important to the organization as a guide to determine the relationship between technostress on psychological and physical health. Besides, it will give the overall ideas to the organization about the importance of knowing the relationship of technostress and the health of workers especially on psychological and physical health. In addition, this study also will provide guidance and awareness to the management at Universiti Teknologi MARA (UiTM) to overcome technostress on their psychological and physical health of their employees.

1.9.2 Employees

The organization and the technology users can use the information given in this research to identify the relationship between technostress psychological health and physical health. The organization also can use this research as a prevention and

intervention in their organization. An organization can do the intervention program such as an awareness campaign to create awareness about the effects of technostress. The employees can repeatedly stand up, stretching muscles and exercising when they are using technology for excessive time. Furthermore, the employees will alert with their health and use the technology effectively.

1.9.3 Future Researchers

This study will be used as a source for academic purposes that are useful to all parties. It is also can be used as a source of distribution of information to students, technology users and academic purposes to enhance their understanding of technostress, psychological health and physical health. Furthermore, this study is expected to be the value-added to the existing literature and can be leveraged by other researchers to develop and use it as reference and guide.

1.10 Research Limitations

The technology users are from the various kinds of generation not only the lecturers. In this study, the respondents only focused on the lecturers in Universiti Teknologi MARA, Jengka Branch. Besides, this study also only focused on certain dimensions of psychological and physical health. Furthermore, the findings from this study cannot be used in another organization because the information is different and only can be use in the organization that has been chosen.

1.11 Conceptual and Operational Definition

1.11.1 Technostress

The original terms are from Brod (1984), who describe technostress as a "modern disease" of adaption caused by not being able to cope with new technologies in a health manner.

The definition of technostress in this research refers to personal stress generated by the use of technology devices. In this study, the five dimension introduced by Tarafdar, et al (2011) which are technology overload, technology invasion, technology complexity, technology uncertainty and technology insecurity was used to measured technostress.

1.11.2 Psychological Health

According to World Health Organization (WHO) (2005) psychological health refers to mental health that describe a state of psychological well-being in which the individual realizes his or her own abilities can cope with normal stresses of life.

In this research psychological health refers to emotional and mental well being when used the technology devices. Psychological distress, cognitive symptoms and sleep disturbance was used to measured psychological health. Psychological distress refers to the level of happiness, experience of depressive and anxiety symptoms. Cognitive symptoms refer to the concentration problems, indecisive and feeling distracted. Lastly, sleep disturbance refers to interference in the technology users' sleep. It happens when

they need to wake up in certain hours to check their mobile while sleeping due to the intensive technology use.

1.11.3 Physical Health

According to Coker et al (2000) physical health refers to an essential part of someone's overall health which includes everything ranging from physical fitness to overall wellness.

In this research, physical health refer to body discomforts that faced by technology users when used technology devices. In this research, musculoskeletal discomforts and also eyestrain was used to measure physical health. Musculoskeletal discomforts refer to the body discomfort that focus on the neck, shoulder, back and also finger discomfort. Eyestrain refers to the stress to the eye due to long hours of focusing on the gadget and laptop screen.

1.12 Conclusion

This chapter highlights the background of the study, problem statement, research questions, research objectives, significance of this study and the limitations. Based on the above discussion, researcher shall explore the relationship between technostress, psychological health and physical health among technology users to answer the research questions and address the problems that underlie this study. The following chapters shall look into the literature review and methodological approach in answering the research questions.

References

Abben, P. (2011). A moderate amount of stress can be good for you. *Journal Educational Administration, 3*(4), 35-44.

Ahmad, U, & Ismail, S. (2011). The impact of technostress on organisational commitment among malaysian academic librarians. *Singapore Journal of Library & Information Management, 38*(3), 103-120.

Alleyne, R. (2011). The Young Generation are "Addicted" to Mobile Phone. *Journal of Psychophysiology, 12*(1), 45-50.

Alleyne, R. (2011). The young generation are "addicted" to mobile phoe. *Journal of Psychophysiology, 12*(1), 45-50.

American Optometric Association, (1997). The Effects of Computer Use on Eye Health and Vision. In American Association (Ed.). Saint Louis.

Anderson, J. H., Kaergaard, A., Mikkelsen, S., Jensen, U. F., Frost, P., & Bonde, J. P. (2003). Risk Factors in the Onset of Neck/ Shoulder Pain in a Prospective Study of Workers in Industrial and Service Companies. *Occupational Environment Medicine, 60*(4), 649-654.

Anderson, J. H., Kaergaard, A., Mikkelsen, S., Jensen, U. F., Frost, P., & Bonde, J. P. (2003). Risk factors in the onset of neck/ shoulder pain in a prospective study of workers in industrial and service companies. *Occupational Environment Medicine, 60*(4), 649-654.

Andersson, G., & Cuijpers, P. (2009). Internet-based and other computerized psychological treatments for adult depression: A meta analysis. *Cognitive Behavioral Therapy, 38*(2), 196-205.

Andin, C., & Ali, H. (2011). Penggunaan Teknologi Maklumat dan Komunikasi (ICT) Dalam Kalangan Guru-Guru Sekolah Kebangsaan. *Universiti Teknologi Malaysia, 12*(3), 221-228.

Andrews, G., Cuijpers, P., Craske, M. G., McEvoy, P., & Titov, N. (2010). Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: A meta-analysis. *Journal of Psychology, 5*(10), 1-6.

Arnetz, B. B., & Wiholm, C. (1997). Technological stress: Psychophysiological Symptoms in Modern Offices. *Journal of Psychosomatic Research, 43*(1), 35-42.

Aydeniz, A., & Gursoy, S. (2008). Upper extremity musculoskeletal disorders among computer users. *Turk J Med Sci, 38*(3), 235-238.

Ayob, A. M. (2005). *Kaedah penyelidikan sosioekonomi* (3rd ed.). Kuala Lumpur: Dewan Bahasa & Pustaka.

Ayyagari, R. (2007). *What and Why of Technostress: Technology Antecedents and Implication.* Clemson University.

Azizi, Y., Shahrin, H., Yusof, R., & Rahim, H.(2006). *Menguasai Penyelidikan Dalam Pendidikan*. Malaysia: PTS Publication & Distributors Sdn. Bhd.

Baldwin, J., & Lin, Z. (2002). Impediments to advanced technology adoption for candaian manufacturers. *Research Policy, 31(5),* 1-18.

Barlow, D. H., & Durand, V. M. (2012). Abnormal Psychology: An Integrative Approach 6th edition. In W. C. Learning (Ed.). Belmont.

Barrow, K. (2013). Using Simple Modern Technology to Improve Your Small Business. *Journal of Business Research, 23*(2), 21-34.

Barrow, K. (2013). Using simple modern technology to improve your small business. *Journal of Business Research, 23*(2), 21-34.

Bashir, M., *et al*. (2008). Reliability and Validity of Qualitative and Operational Research Paradigm. *Pakistan Journal of Statistic and Operation Research, 4*(1), 35-45.

Bengt B. Arnetz, M. B. (1993). Techno-stress. Psycho-physiological Consequences of Poor Man-Machine Interface, in Human-Computer Interaction: Applications and Case Study, 54(4), 891-896.

Berenson, M. L., Levine, D. M., & Krehbiel, T. C. (2009). *Basic Business Statistics Concept and Application* (11th ed.): Prentice Hall Internal Incorporation.

Bernard, B. P, *et al*. (1997). A Critical Review of Epidemiologic Evidence for Work-Related Musculoskeletal Disorders of the Neck, Upper Extremity, and Low Back. In US Department of Health and Human Service (Ed.), *Centers for Disease Control and Prevention*. Columbia: DHHS (NIOSH) Publication.

Besah, E. B. (2004). Kemahiran Guru-Guru Sekolah Kebangsaan Daerah Batu Pahat Menggunakan Komputer Dalam Pengajaran dan Pembelajaran. *Universiti Teknologi Malaysia*.

Blix, A. G., Cruise, R. J., & Blix, G. G. (2004). Occupational Stress among University Teachers. *Journal of Educational Research, 36*(1), 157-169.

Brillhart, P. E. (2004). Technostress in the Workplace Managing Stress in the Electronic Workplace. *Journal of American Academy of Business, Cambridge, 5*, 302-307.

Britton, J., *et al*. (2000). Technostress: Real Issues, Real Solutions. *Journal of Human Computer Interaction,* 43(2), 425-433.

Brod, C. (1984). *Technostress: The Human Cost of the Computer Revolution*: Addison-Wesley Publishing Company.

Brough, P. (2013). Technostress: Aussies drowning in tech overload. from http://www.news.com.au/business/your-business/technostress-aussies-drowning-in-tech-overload/story-fn9evb64-1226577738898

Bousted, M. (2014). Computers in the elementary classroom. *Journal of Education*, 5(1), 443-450.

Buckle, P. W., & Devereux, J. J. (2002). The Nature of Work-Related Neck and Upper Limb Musculoskeletal Disorder. *Applied Ergonomics, 33* (3), 207-217.

Cail, F., & Aptel, M. (2005). Incidence of Stress and Psychosocial Factors on Musculoskeletal Disorders in CAD and Data Entry. *International Journal of Occupational Safety and Ergonomics, 11*(2), 119-130.

Cail, F., & Aptel, M. (2005). Incidence of stress and psychosocial factors on musculoskeletal disorders in cad and data entry. *International Journal of Occupational Safety and Ergonomics, 11*(2), 119-130.

Caro, D. H. J., & Sethi, A. S. (1985). Strategic Management of Technostress: The Chaining of Prometheus. *Journal of Medical System 9*(3), 291-304.

Cho, S. I., Eum, K. D., Choi, B., Paek, D., & Karasek, R. (2008). Social Class, Job Insecurity and Job Strain in Korea. *Scandavian Journal of Work, Enviroment & Health 50* (6), 60-65.

Choi, H. S., Kim, T. G., & Cho, Y. G. (2011). A Study on the Effects of Technostress on Flow and Continous Use of Smartphone. *20*(4) 175-184.

Chua, Y. P. (2006). *Asas statistik penyelidikan*. Kuala Lumpur: McGraw-Hill Malaysia.

Coakes, S. J., Steed, L., & Dzidic, P. (2006). *Spss Version 13.0 for Windows; Analysis Without Anguish*. Australia: John Wiley and Sons Australia Ltd.

Cohn, M. (2000). *How Does Technology Affect the Workplace Today?* Paper presented at the IEEE-USA 2000 Careers Conference.

Coker, A. L., Smith, P. H., Bethea, L., King, M. R., & McKeown, R. E. (2000). Physical Health Consequences of Physical and Psychological Intimate Partner Violence. *American Medical Association, 9*(1), 451-457.

Coklar, A. N., & Sahin, Y. L. (2011). Technostress Levels of Social Network Users Based on ICTs in Turkey. *Journal of Social Sciences, 23*(2), 171-182.

David, C. (2012). Why Older Generations Have Trouble With Technology? *Journal Educational Administration, 4*(1), 22-27.

Dehmler, K. M. (2009). *Adolescent Technology Usage, Sleep, Attention and Academics.* Rochester Institute of Technology, *5*(3), 33-49.

Dewe, P. J., O'Driscoll, M. P., & Cooper, C. L. (2012). Theories of Psychological Stress at Work. *Handbook of Occupational Health and Wellness, 53*(3), 23-38.

Doheny, K. (Producer). (2011) Sleep and Technology Don't Mix: Sleep Poll Too Much Technology and Caffeine, Too Little Sleep Plague Teens and Adults, Survey Finds. retrieved from http://www.webmd.com/sleep-disorders/news/20110306/sleep-and-technology-dont-mix-sleep-poll

Doherty, D. T., Moran, R., & Kartalova-O'Doherty, Y. (2008). Psychological Distress, Mental Health Problems and Use of Health Services in Ireland, *Health Research Board*. Dublin.

Dongen, et. al, (2003). The Cumulative Cost of Additional Wakefulness: Dose-Response Effects on Neurobehavioral Functions and Sleep Physiology from Chronic Sleep Restriction and Total Sleep Deprivation. *Rapid Publication, 26*(2), 117-126.

Dror, I. E. (2004). Language as a cognitive technology, *Journal of Work, Environment and Health, 13*(2), 217-226.

Duckett, S. J. (2004). *The Australian Health Care System*. Melbourne: Oxford University Press.

Durrishah, I., Hadmidah, A. R., Hapriza, A., Fadilah, Z., Rossilah, J., & Sharizatul, M. N. (2004). *Level of Awareness of UTM Staff on Occupational Safety and Health at the Workplace*. FPPSM: Universiti Teknologi Malaysia

Edwards, J. R. (1996). An Examination of Competing Versions of the Person-Environment Fit Approach to Stress. *Academy of Management Journal, 39*(2), 292-339.

Ekman, A., Anderson, A., Hagberg, M., & Hjelm, E. W. (2000). Gender Differences in Musculoskeletal Health of Computer and Mouse Users in the Swedish Workforce. *Oxford Journals, 50*(8), 608-613.

Fisher, W., & Wesolkowski, S. (1999). Tempering Technostress. *IEEE Technology and Society Magazine*, 48(3), 28-33.

Fitzgerald, C. (Producer). (2012, 18 February 2013) How to Cure a Headache from Staring at the Screen on a Laptop. Retrieved from http://www.ehow.com/how_8184186_cure-headache-staring-screen-laptop.html

Frances, A. J., & Simeon, O. K. (2011). Technostress in the Age of Information Communication Technology: A Case Study of Distance Education. *International Research Journal, 2*(11), 1654-1660.

French, J. (1973). Person-Role Fit. *Occupational Mental Health, 3*(2), 15-20.

Frey, L *et. al,* (2000). *Investigating Communication: An Introduction to Research Methods.* 2nd ed. Boston: Allyn and Bacon

Gerr, F., Monteilh, C. P., & Marcus, M. (2006). Keyboard use and musculoskeletal outcomes among computer users. *Journal of Occupational Rehabilitation 16*(3), 265-277.

Gifford, W., Bobbitt, H., & Slocum, J. (1979). Message characteristics and perceptions of uncertainty by organizational decision makers. *Academy of Management Journal, 22*(4), 458-481.

Gillespie, R. M. (2006). *The Musculoskeletal Impact of Computer and Electronic Game Use on Children and Adolescents.* New York University, New York.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report, 8*(4), 597-607.

Goldberg, D. P., Gater, R., Sartorius, N., Ustun, T. B., Gureje, M. P. O., & Rutter, C. (1997). The Validityof Two Versions of the GHQ in the Who Study of Mental Illness in General Health Care. *Cambridge University Press, 27*(3), 191-197.

Gravetter, F. J., & Forzano, L.-A. B. (2009). Research Methods for the Behavioral Sciences, 345-346.

Haines, V. Y., Marchand, A., Genin, E., & Rousseau, V. (2012). A Balanced View of Long Work Hours. *International Journal of Workplace Health Management, 5*(2), 104-119.

Hair, J. F., *et al.* (2007). *Research methods for business*. West Sussex, England: John Wiley & Sons Ltd, 53-60.

Hakimi, A. (2010). Ledakan ICT Boleh Mendatangkan Teknostres Kepada Para Guru. *Journal Educational Administration, 3*(4), 12-19.

Hales, D. (2008). *An invitation to health* (5th ed.). USA: Thomson Higher Education.

Hales, D. (2010). *An invitation to health brief 2010- 2011*. USA: Cengage Brain.

Hales, T, et al. (1994). Musculoskeletal Disorders among Visual Display Terminal Users in a Telecommunications Company. *Ergonomic, 37*(10).

Hanman, N. (2005). Growing Up with the Wired Generation. Retrieved 3.1.2014, from http://www.theguardian.com/technology/2005/nov/10/newmedia.media

Hannan, L. M., Monteilh, C. P., Gerr, F., & Kleinbaum, D. G. (2005). Job strain and risk of musculoskeletal symptoms among a prospective cohort of occupational computer users. *Scandinavian Journal of Work Environment & Health, 31*(5), 375-386.

Harper, S. (2000). Managing Technostress in UK libraries: A Realistic Guide. Retrieved 13.3.2013, from http://www.ariadne.ac.uk/issue25/technostress/intro.html

Hassan, J., & Edje, N. (2009). Penggunaan Internet di dalam Mempertingkatkan Proses Pengajaran dan Pembelajaran (P&P) dalam Kalangan Pensyarah Fakulti Pendidikan, UTM Skudai. *Universiti Teknologi Malaysia*, 1-7.

Heaney, C., Israel, B., & House, J. (1994). Chronic Job Insecurity among Automobile Workers: Effects on Job Satisfaction and Health. *Social Science Medication, 38*(10), 1431-1437.

Hedge, A., Morimoto, S., & Mccrobie, D. (1999). Effects of Keyboard Tray Geometry on Upper Body Posture and Comfort. *Ergonomic, 42*(10), 1333-1349.

Heissen, R. K., C.R. & Knight. (1987). Assessing Computer Anxiety: Development and Validation of the Computer Anxiety Rating Scale. *Computers in Human Behavior, 3*(1), 41-59.

Hibbard, C. (2012). Computers Cause Migraines. *Journal of Public Health,* 52(2), 345-355.

Higuchi, S., et. al. (2005). Effects of Playing a Computer Game Using a Bright Display on Presleep Physiological Variables, Sleep Latency, Slow Wave Sleep and REM Sleep. *Journal of Sleep Research, 14*, 267-273.

Hill, C. (2008). Cognitive. Retrieved 22 March 2013, from http://alzheimers.about.com/od/glossary/g/cognitive.htm

Hjelm, J. (2009). *The Dimensions of Health: Conceptual models*. USA: John and Bartlett Publishers.

Honeybourne, T. (2013). Stress Having Big Impact on Teachers. *Journal Educational Administration, 3*(1), 23-41.

Hulbert, D. (1998). Librarians and Librarianship in the Information Age. *ERIC Document Reproduction Service.*

Hung, W. H., Chang, L. M., & Lin, C. H. (2011). Managing the Risk of Overusing Mobile Phones in the Working Environment: A study of Ubiquitous Technostress.

Hurrell, J. J. (2001). Psychosocial Factors and Musculoskeletal Disorders. *Exploring Theoretical Mechanism and Perspective, 1*, 233-256.

Hyun, S. C. *et. al*. (2011). A Study on the Effects of Technostress on Flow and Continous Use of Smartphone.

Ibrahim, et. al. (2007). Technostress: A Study Among Academic and Non- Academic Staff. *Ergonomic and Health Aspects* 118-124.

Idris, A. R., & Atan, N. (2008). Penggunaan Internet dalam Kalangan Guru-Guru Sekolah Rendah di sekitar Johor Bahru, Johor. *Universiti Teknologi Malaysia,*

Indiye, W. G., & Zheng, Q. (2010). Organizational Culture and Information Systems Implementation: A Structuration Theory Perspective. 133-142.

Insitute of Patient Education (2011). Sleep disorder. Retrived 23 March 2013. From www.X-Plain.com.

Irshad, H., & Muhammad, S. (2008). Role of Information Technologies in Teaching Learning Process: Perception of the Faculty. *Turkish Online Journal of Distance Education, 9*(2), 46-56.

Ishak, M. S. (2002). *Pengenalan Psikologi Industri dan Organisasi*. Skudai: Universiti Teknologi Malaysia.

Ito, J. K., & Brotheridge, C. M. (2001). An Examination of the Roles of Career Uncertainty, Flexibility, and Control in Predicting Emotional Exhaustion. *Journal of Vocational Behaviour, 59*, 406-424.

Izecksohn, L. (2012). Fluids Hypertension Syndromes: Migraines, Headaches, Normal Ttension Glaucoma, Benign Intracranial Hypertension, Caffeine Intolerance. Etiologies, Pathophysiologies and Cure.

Joppe, M. (2000). The research process. Retrieved June 23, 2013, from http://www.ryerson.ca/~mjoppe/rp.htm

Karasek, R. A. (1979). Job Demands, Job Decision Latitude and Mental Strain: Implications for Job Redesign. *Administrative Science Quarterly, 24*, 285-308.

Keating, E. (2004). Current Societal Problems with Mobile Phone Usage in 15 Countries. *Mobile Society Research Institute, 7*(1), 1-11.

Krejcie, R. V., & Morgan, D. W. (1970). Determining Size for Research Activites. *Educational and Psychological Measurement, 30*, 607-610.

Kristensen, T. S., Hanners, H., Hogh, A., & Borg, V. (2005). The Copenhagen Psychosocial Questionnaire—A Tool for the Assessment and Improvement of the Psychosocial Work Environment. *Scandavian Journal of Work, Enviroment & Health, 31*(6), 438-449.

Kuorinka, I. (1987). Standardised Nordic Questionnaires for the Analysis of Musculoskeletal Symptoms. *Journal of Applied Ergonomics, 18*(3), 233-237.

Kupersmith, J. (1998). Technostress in the Bionic Library. *School Library Journal, 43(2)*, 154-162.

Lassen, C. F., *et al.* (2004). Elbow and Wrist/Hand Symptoms among 6,943 Computer Operators: A 1-year Follow-Up Study (The Nudata Study). *American Journal of Industrial Medicine, 46*, 521-533.

Latham, B. (2007). Sampling: What is it? *Quantitative Research Methods.* 1-13.

Lazzari, S. A. D. (2000). *Emotional Intelligence, Meaning and Psychological Well-Being: A Comparison between Late Adolescence.* Trinity Western University.

Li, S., *et al.* (2005). The Impact of Media Use on Sleep Patterns and Sleep Disorders among School- Aged Children in China. *Shanghai Key Laboratory of Children's Environment Health, 30*(3), 361-367.

Lin, Z., & Popovic, A. (2002). *The effects of computers on Workplace Stress, Job Security and Work Interest in Canada*. Canada: Human Resource Development Canada.

Linton, S.-J. (2013). Employee Health is Organizational Wealth. *Journal of Health and Social Behavior, 43*(3), 342-346.

Lorenz, K. W. F., & Conger, R. (2007). Parental Support and Adolescent Physical Health Status: A Latent Growth-Curve Analysis. *Journal of Health and Social Behavior, 38*, 149-163.

Lorenzo, J. L., & Barbanoj, M. J. (2002). Variability of Sleep Parameters Across Multiple Laboratory Sessions in Healthy Young Subjects: The "Very First Night Effect" *Journal of Psychophysiology, 39*, 409-413.

Loschel, A., & Otto, V. M. (2003). Why uncertainty causes stress, and how to stop it. Retrieved 20.11.2013, from http://www.managedluck.co.uk/stress/

Luttmann, A., & Caffier, G. (2003). Preventing /musculoskeletal Disorders in the Workplace. In W. H. Organization (Ed.), *Protecting workers' Health Series* (Vol. 5, pp. 1-32).

Maad, A. H. (2009). Peranan Guru dalam Era IT. Kuala Lumpur: Arus Intelek Sdn Bhd.

Majid, K. M. (2000). *Kaedah penyelidikan pendidikan* (5th ed.). Kuala Lumpur: Dewan Bahasa dan Pustaka.

Maldonado, M. (2013). How stress affects mental health. *Journal Educational Administration, 3*, 13-15.

Marchand, A., & Durand, P. (2011). Psychosocial and Biological Indicators in Evaluation of and Intervention in Mental Health Problems at Work. *Healthcare Papers*, 6-19.

Marican, S. (2005). Kaedah Penyelidikan Sains Sosial. Kuala Lumpur: Prentice Hall

Mark, G. M., & Smith, A. P. (2008). Stress models: A Review and Suggested New Direction. *Mark.Indd*, 1-34.

Marsh, R. F., & Blau, S. (2007). Workload Factors Impacting Managers. *Journal of Management Development, 26*(3), 200-212.

Matkin, G. M. (2007). Internet as Teenager in Higher Education: Rapid growth, Transformation, Uncertain but Bright Future. *Center for Studies in Higher Education*.

Matkin, G. M. (2007). Internet as Teenager in Higher Education: Rapid growth, Transformation, Uncertain but Bright Future. *Center for Studies in Higher Education*.

Mesquita, G., & Reimão, R. (2007). Nightly Use of Computer by Adolescents: Its Effect on Quality of Sleep. *Arq Neurosoquiatr, 65*(2-B), 428-432.

Mesquita, G., Ferreira, S., Rossini, S., & Reimão, R. (2010). Sleep in Young Weekend Users of the Internet. *Neurobiologia, 73*(3), 59-68.

Meyer, D. (2006). Technology, Job Satisfaction and Retention: Rural Mental Health Practitioners. *Journal of Rural Health, 22*(2), 158-163.

Ming, Z., & Zaproudina, N. (2003). Computer Use Related Upper Limb Musculoskeletal. *Journal of Pathopsysiology, 9*, 155-160.

Ming, Z., & Zaproudina, N. (2003). Computer use related upper limb musculoskeletal. *Journal of Pathopsysiology, 9*, 155-160.

Ministry of Health, (2012). Malaysian Statistic on Mental Health Problem in Malaysia. Putrajaya, Malaysia.

Morgan, R. (2013). Telstra Customers Most Likely to have Old Mobile Phones. Retrieved 19.10.2013, from http://www.roymorgan.com/findings/5224-telstra-customers-have-old-mobile-phones-201310070103

Muhl, C. J. (2003). Workplace E-mail and Internet Use: Employees and Employers Beware. *Monthly Labor Review*, 36-46.

Muller, J. W. (2010). Dry eye as a trigger for headaches. *Journal of Public Health, 42(5),* 234-245.

Nadeau, S. E. (2007). Headache. *Journal of Bio Medical Centre Public Health.* 1-13.

Nelida, F. R. (2004). Job Insecurity and Stress Level. *Interdisciplinaria*, 249-257.

Nielsen. (2013). The Asian Mobile Consumer Decoded. *Statistic of Smartphone Used*,

Occupational Safety and Health Service (2003). Healthy Work: Managing Stress and Fatigue in the Workplace. In Department of Labour (Ed.). Wellington, New Zealand.

Odabasi, F., & Eristi, S. (2012). Awareness of Healthy Computer Use and Computer Ergonomic among Pre-Service Teachers. *International Journal of Technology, Knowledge and Society, 4*(1), 19-30.

Office of Communication and Public Liaison (2009). Headache: Hope through Research. In National Institute of Neurological Disorders and Stroke (Ed.) (Vol. 09-158): NIH Publication.

Öztug, Ö., & Cowie, H. (2011). Coping with musculoskeletal pain: Implications for office workers. *The Turkish Online Journal of Educational Technology, 10*(1), 81-88.

Pamela, K., & Lu, Y. (2010). When More is Too Much: Operationalizing Technology Overload and Exploring its Impact on Knowledge Worker Productivity. *Computers in Human Behavior*, 1061-1072.

Paulsen, N., et al. (2004). Job Uncertainty and Personal Control During Downsizing: A Comparison of Survivors and Victims. *Universiti of Queensland*, 1-34.

Phillips, J. J., & Phillips, P. P. (2002). Technology's Return on Investment. *4*(4), 512-532.

Pinquart, M., & Sorenson, S. (2003). Differences between Caregivers and Non-Caregivers in Psychological Health and Physical Health: A Meta-Analysis. *Psychology and Aging*, *18*(2), 250-267.

Poynton, C. A. (1996). Reducing Eyestrain from Video and Computer Monitors. 1-6.

Punnett, L., & Wegman, D. H. (2004). Work-Related Musculoskeletal Disorders: The Epidemiologic Evidence and the Debate. *Journal of Electromyography and Kinesiology*, 13-23.

Puustinen, P. J., et. al. (2011). Psychological Distress Measured by the GHQ-12 and Mortality: A Prospective Population- Based Study. *Scandinavian Journal of Public Health, 39*, 577-581.

Quinn, B. A. (2007). Overcoming Technostress in Reference Services to Adult Learners. 1-24.

Reme, S. E., Eriksen, H. R., & Ursin, H. (2008). The Cognitive Activation Theory of Stress (CATS) Offers a Psychobiological Explanation for the Relationship between Life Events, from Hassles in Worklife to Dramatic Events, and Individual Health. *Scandavian Journal of Work, Enviroment & Health*(6), 177-183.

Repetti, R. L., Taylor, S. E., & Seeman, T. E. (2002). Risky families: Family social environments and the mental and physical health of offspring. *American Psychological Association, 128*(2), 330-366.

Rice, V. H. (2012). *Handbook of Stress, Coping, and Health: Implication of Nursing Research, Theory, and Practice*: Sage Publications Inc.

Ridner, S. H. (2004). Psychological Distress: Concept Analysis. *Journal of Advanced Nursing, 45*(5), 536-545.

Riedl, R., et. al. (2011). Technostress from a Neurobiological Perspective: System Breakdown Increases the Stress Hormone Cortisol in Computer Users. *Business & Information Systems Engineering* 61-69.

Rifkin, J. (2004). *The End of Work: The Decline of the Global Labor Force and the Dawn of the Post-Market Era*. New York: Jeremy P. Tarcher Publishing.

Riley, R. W. (2010). Educators, Technology and 21st Century Skills: Dispelling Five Myths: A study on the Connection Between K-12 Technology Use and 21st Century Skills. *Journal Educational Administration, 34*(2), 345.

Ritcher, A. (2011). Job Insecurity and Its Consequences: Investigating Moderators, Mediators and Gender. *Journal of Social Science,* 47(4), 43-55.

Robley, L., Ballard, N., Holtzman, D., & Cooper, W. (2010). The Experience of Stress for Open Heart Surgery Patients and their Caregivers. *Western Journal of Nursing Research, 32*(6), 794-813.

Rodriguez, N. (2004). Job Insecurity and Stress Level. *Occupational Medicine,* 247-257.

Rogers, M. T., N; Coetsee, M; Curry, B; Semple, S. (2011). Knee Osteoarthritis and the Efficacy of Kinesthesia, Balance & Agility Exercise Training: A Pilot Study. *Journal of Exercise Science, 4,* 124- 132.

Rohini, F. (2004). Penggunaan Internet di Kalangan Pelajar Tahun 4 Pendidikan Teknik dan Vokational. *Fakulti Pendidikan, Universiti Teknologi Malaysia*.

Routsalainen, J. H., & Verbeek, J. H. (2006). Preventing Occupational Stress in Healthcare Workers. *Cochrane Database of Systematic Review*(4), 134-141.

Sami, L. K., & Pangganaiah, N. B. (2006). " Technostress " a Literature Survey on the Effect of Information Technology on Library Users. *Library Review, 55*(7), 429-439.

Schulz, R., & Sherwood, P. R. (2008). Physical and Mental Health Effects of Family Caregiving. *Journal of Social Work Education, 44*(3), 23-27.

Sehrish, T., Rosman, Y., Kamran, A., & Anwar, K. (2012). The Effects of Work Overload on Employees' Performance in Relation to Customer Satisfaction: A Case of Water & Power Development Authority, Attock, Pakistan. *World Journal of Social Sciences, 2*(1), 174-181.

Sekaran, U. (2003). *Research Methods for Business: A Skill Building Approach* (4th ed.). USA: John Wiley and Sons Inc.

Sellgren, K. (2014). Teachers Rise in Mental Health Fears. *Journal Educational Administration*.

Selye, H. (1956). *The stress of life*. New York: McCraw- Hill.

Selye, H. (1991). History and Present Status of the Stress Concept. *Columbia University Press*, 21-35.

Shu, Q., Tu, Q., & Wang, K. (2011). The Impact of Computer Self-Efficacy and Technology Dependence on Computer-Related Technostress: A Social Cognitive Theory Perspective. *International Journal of Human Computer Interaction, 21*(10), 923-939.

Sparks, K., et al. (1997). The Effects of Work Hours on Health: A Meta-Analytic Review. *Journal of Occupational and Organizational Psychology*(70), 391-408.

Stock, G. N., & Tatikonda, M. V. (2007). The Joint Influence of Technology Uncertainty and Interorganizational Interaction on External Technology Integration Success. *Journal of Operations Management, 26*, 65-80.

Stone, J. (2013). Technology and Older Generation Don't Exactly Mix. *Journal of Social Sciences, 9*, 122-133.

Sudhakar, G. P., Farooq, A., & Patnaik, S. (2012). Measuring Productivity of Software Development Teams. *Serbian Journal of Management, 7*(1), 65-75.

Susi, C. S. T. (2013). Technostress in the Office: A Distributed Cognition Perspective on Human-Technology Interaction. *Springer-Verlag London*.

Tabachnick, B. G., & Fidell, L. S. (2006). *Using multivariate statistics* (5th ed.). USA: Allyn and Bacon.

Tarafdar, M. et, al. (2011). Crossing to the Dark Side: Examining Creators, Outcomes and Inhibitors of Technostress. *Communication of the ACM, 54*(8), 113-120.

Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2007). The Impact of Technostress on Role Stress and Productivity. *Journal of Psychological Health,* 43, 28-56.

Tazawa, Y., & Okada, K. (2011). Physical Signs Associated with Excessive Television-Game Playing and Sleep Deprivation *Pediatr. Int, 43*, 647-650.

Teijlingen, E. R. V., & Hundley, V. (2001). The Importance of Pilot Studies. *Sociology at Surrey*(35).

The National Health Interview Survey (2009). Physical Health Problems among Educator in United States. Boston.

Thomée, S., Härenstam, A., & Hagberg, M. (2011). Mobile Phone Use and Stress, Sleep Disturbances, and Symptoms of Depression among Young Adults - A Prospective Cohort Study. *Bio Medical Centre Public Health, 11*(66), 1-11.

Tiemo, P. A., & Ofua, J. O. (2010). Technostress: Causes. Symptoms and Coping Strategies among Librarians in University Libraries. *International Research Journal, 1*(12), 713-720.

Tu, Q. et, al. (2008). Technostress Under Different Organizational Environments: An Empirical Investigation. *Computers in Human Behavior, 24*(6), 3002-3013.

Tu, Q., Wang, K., & Qinshu. (2005). Computer- Related Technostress in China. *Communication of the ACM, 48*(4), 77-81.

Tuettemann, E., & Punch, K. F. (2007). Psychological Distress in Secondary Teachers: Research Findings and Their Implication. *Journal Educational Administration, 30*(1), 42-54.

Ursin, H. (2010). Cognitive Activation Theory of Stress (CATS). *Journal of Public Health,* 32(2), 54-66.

US Department of Health and Human Service (2011). Your Guide to Health Sleep. In National Institute of Health (Ed.), *11-5271*. United States.

Voss, M., Nylen, L., Floderus, B., Diderichsen, F., & Terry, P. (2004). Unemployment and Early Cause-Specific Mortality: A Study based on the Swedish Twin Registry. *AM J Public Health, 94*(12), 2155-2161.

Wærsted, M., Hanvold, T. N., & Veiersted, K. B. (2010). Computer Work and Musculoskeletal Disorders of the Neck and Upper Extremity: A Systematic Review. *BMC Musculoskeletal Disorder, 11*(79), 1-15.

Wahab, *et. al* (2006). Computer Usage in Teaching and Learning among Secondary School Teachers: A Case Study in Penang. *Journal of Education, 24*(1), 1-23.

Waheed, M., & Khan, Q. (2012). The Influence of Facilitation, Low Transaction Cost and Convenience on Customer's Turnover Intention from Conventional to Web-Based Banking. *International Journal of Management, IT and Engineering, 2*(5), 67- 79.

Wati, C. K. Y. (2011). What Factor do Really Influence the Level of Technostress in Organizations?: An Empirical Study. 339-348.

Watson, D., & Pennebaker, J. W. (1989). Health Complaints, Stress and Distress: Exploring the Central Role of Negative Affectively. *Journal of American Psychology, 96*(2), 234-254.

Watt, W. S. (2003). Computer Vision Syndrome and Computer Glasses. *Journal of Public Health.* 34-44.

Weil, M. M., & Rosen, L. D. (1997). *Technostress: Coping with Technology*. New York: John Wiley & Sons.

Wilson, D. H. (2011). The Terrifying Truth about New Technology. *The Wall Street Journal*, 12-18.

World Health Organization (WHO), (2005) Promoting Mental Health. & H. Herrman, S. Saxena & R. Moodie (Vol. Ed.). The University of Melbourne.

Yuang. (2005). Pravalence of Musculoskeletal Symptoms in Taiwan's Traditional Industries. *Asian Journal of Quality, 15*(2), 33-40.

Zamalia, M. (2008). *Handbook of Research Methodology*. Shah Alam, Selangor: UPENA (Universiti Teknologi Mara).

Zulkarnain, Z., & Hishamudin, M. S. (2001). *Analisis Data: Menggunakan SPSS Windows*. Skudai: Penerbit Universiti Teknologi Malaysia.