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**THE DIMENSIONS OF TECHNOSTRESS AMONG ACADEMIC LIBRARIANS OF
UNIVERSITIES MEDICAL SCIENCES IN MAZANDARAN PROVINCE**

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ABSTRACT

Techno-stress is a new term including technology and stress. This paper studies the dimensions of technostress among academic librarians of Universities Medical Sciences in Mazandaran Province.

The research method is descriptive and in terms of analysis is correlation. A total of 70 academic librarians from 2 Medical Sciences universities (Mazandaran and Babol) of Northern of Iran were chosen as respondents for this study, that they 66 librarians answered the questions. In this study, self-administered questionnaire of techno-stress (Techno-overload, Techno-invasion, Techno-complexity, Techno-insecurity and Techno-uncertainty) were used to gather information. Respondents were asked to indicate the extent of their agreement or disagreement to each statement in the questionnaire based on a seven-point numerical scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Techno-stress reliability obtained equal to 0.953. In this study for analyzing of data, Kolmogorov-Smirnov test, one sample t-test and Pearson's correlation coefficient was used. Findings showed that female librarians (63.6%) were more than male librarians (36.4%). The largest number, 37 people were in the age group (41 years and

more) and the minimum number of 2 people were in the age group (25-20), respectively. Techno stress in men was higher than women. Techno stress among academic librarians of Babol University of Medical Sciences is more than in academic librarians of MazUMS. Among the components of techno-stress, techno-uncertainty has the highest level of techno-stress level ($3.40 \pm .81$) among academic librarians. Among the components of techno-stress, techno-overload has the highest level of techno-stress level ($3.17 \pm .57$) among academic librarians. The application of technology has become a tendency in most organizations today as technology has generally been found to increase efficiency and effectiveness. It is significant that librarians be conscious of the specific effects of technology on their staff.

Keywords: Technostress, librarian, Information and Communication Technology, Libraries

INTRODUCTION

The introduction of information and communication technologies (ICT) in work environments has led to multiple benefits for individual employees (e.g., the automation of tedious tasks) and organizations as a whole (e.g., reduced cycle times, cost savings, and innovations) (Carayon et al., 2015; Fischer & Riedl, 2015). Information and Communication Technology (ICT) is becoming a fast changing and renewing technology for higher education industry. With the advancement of ICT tools and techniques, social media evolved as a prominent communications tool and found to be a facilitating tool for teaching and learning, particularly in the higher education (Jena, 2015). With the widespread of Information and Communication Technologies (ICTs), the

issue of technostress becomes increasingly pervasive (Liu & Wang, 2011). Previous research has revealed a number of insights into TS sources and creators (i.e., stressors such as computer breakdown) (Riedl, 2012; Tarafdar, Tu, & Ragu-Nathan, 2010) and negative consequences (i.e., strains, reflected in reactions such as elevations in stress hormones (Korunka, Huemer, Litschauer, Karetta, & Kafka-Lützow, 1996).

This understanding of stress (i.e., a phenomenon resulting neither solely from the individual nor the environment, but being a consequence of their interplay) forms the basis of most modern organizational stress theories, such as the transactional approach (Lazarus, 1966) or person-environment fit theory (French, Caplan, & Van Harrison, 1982), and is the

result of a long process of development in stress research (Fischer & Riedl, 2015).

Demographic characteristics whose influence on TS familiarities has been revealed include objective characteristics of the individual such as age (Hudiburg, 1995; Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008), a user's skills and abilities such as computer literacy (Tu, Wang, & Shu, 2005), and personality characteristics such as negative affectivity (Ayyagari, Grover, & Purvis, 2011).

However, in recent years it has also been acknowledged that stress is a ubiquitous phenomenon in the workplace throughout organizations worldwide despite the high degree of ICT use in many organizations (World Health Organization: Global health risks, 2009).

Paradoxically, researchers have even started pointing to the significant possible of ICT to act as a new source of work stress. This form of stress is mentioned to as technostress (Ayyagari et al., 2011; Ragu-Nathan et al., 2008; Riedl, 2012; Tarafdar et al., 2010), henceforward TS.

The term technostress has been viewed and described from different perspectives by different authors and behavioural scientists. Brod (1984) defines technostress as a modern disease of adaptation caused by an

inability to cope with the new computer technologies in a healthy manner (Brod, 1984). Weil and Rosen (1997) describe technostress as any negative impact on attitudes, thoughts, behaviours or body physiology caused either directly or indirectly by the use of technology (Weil & Rosen, 1997). Nina (2001) views technostress as a condition resulting from having to adapt to the introduction and operation of new technology, particularly when equipment, support, or the technology itself is inadequate. Technostress can therefore be referred to as negative psychological and physical link between people and the introduction of new technologies. Such negative links is usually caused by all or some of these factors; the quick pace of technological change, lack of proper staff training, an increased workload, lack of standardization of technologies and unreliability of hardware and software. Technostress according to Brod (1984) manifests itself in two distinct and related ways: in the struggle to accept computer technology and in the more specialized form of over identification with computer technology.

The causes of technostress amount to: the quick pace of technological change lack of proper training an increased workload lack

of standardization within technologies the reliability of hardware and software

Four Aspects of Technostress: 1. Physical aspects are eye strain, backaches, headaches, stiff shoulders, neck pain, joint pain, dry mouth and throat, muscle tension, stomach discomfort, keyboard related injuries, chest pain, rapid heart rate, irritable bowel syndrome, increased blood pressure, difficulty in breathing, and others. 2. Emotional aspects like irritability, loss of temper, having high state of anxiety when separated from computer monitor, feelings of indifference, frustration, lack of appreciation, depression, guilt, feeling fearful, paranoia that leads to avoiding computers, negative attitudes and others. 3. Behavioral aspects consists of overly comfortable with computers, overspending on computers, insomnia, uncooperativeness and unwillingness, using computer terms in non-computer conversation, smoking, social withdrawal in favor of terminal time, cruising computer stores, drinking alcohol, and others. 4. Psychological aspects composed of information overload to find, analyze, evaluate, and apply it in right context of resources, underwork and routine jobs lead to frustrations when underemployed or when the work done involves only routine operations, job

security, where people have a fear that computer may replace human roles, professional jealousy produced by technological competency, demotivation due to prolonged period of any technological activity, uncertainty about job role caused by an increased time working with technology (Ennis, 2005).

TS has been defined as “any negative impact on attitudes, thoughts, behaviors, or body physiology that is caused either directly or indirectly by technology” (Wiener, 1948). Technostress is the trends and challenges of the librarians in the 21st century knowledge management. It is a modern disease of adaptation caused by an inability to cope with the new technologies in a healthy manner. It manifests itself in the struggle to accept technological innovations (Laspinas, 2015).

In 1984, Craig Brod identified a condition called technostress as “a modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner” (Brod, 1984). Sandra Champion (1988) extrapolated from Brod’s work when she identified a number of symptoms of technostress in the library environment: anxiety, denial, resistance, technophobia, panic, conflict, mental fatigue, intolerance, perfectionism, and

physical discomforts. These symptoms are indicators of such fears as losing autonomy, losing promotional opportunities, losing control over work environment, being isolated, loss of freedom and privacy, intimidation by documentation, and inability to keep up with rapid change (Champion, 1988; Saunders, 1999).

Technostress in libraries

The desire of library personnel to excel while working in an automated library environment may cause technostress. Technostress may be experienced by a library staff due to intensive use of ICT particularly computer to render information service to users (Francis, Oluwole Olalude, & Popoola, 2013).

The application of ICTs has immensely improved the effectiveness of library activities such as acquisition, circulation, Cataloging, references and serial services (Bichteler, 1986; Murthy, 2015). In the 21st century, the technological motion has increased far beyond our expectations. People in today's society are living in a world full of stresses. With many work and personal needs it is easy for librarians to feel astounded. Technology was presented as timesaver, but the suitability of technology has also raised expectations about what librarians can undertake in the

workplaces (Vieitez, Carcía, & Rodríguez, 2001).

Because changing technology has affected library organizations, job definitions, and required skills, it has contributed to a challenging work environment for staff. At various periods during system migrations or upgrades, staff have had to continue to be productive and provide service while using unstable computer systems (Saunders, 1999).

Generally, librarians are expected to continually reestablish their technical skills while keeping up with a ceaselessly changing environment, even as maintaining a higher strength of productivity (Laspinas, 2015). Vieitez, Carcia, & Rodriguez (2001) publicized that it is an indisputable fact that technology has become an critical part in the 21st century knowledge management. Technological revolution in any organization has not only improved efficiency but also helps reduce the difficulty of tiresomeness in the workplace (Vieitez et al., 2001). Moreover, Murthy & Cholin (2003) illustrated Information technology has been one of the major factors causing changes in the way people communicate, locate, retrieve, and use information. The impact of automation on the library is quite obvious and has created

new types of work, prompted redefinition of certain functions, influenced interpersonal relationships, and transformed traditional organizational structures into new institutional entities. Libraries today are faced with planning for automation within a rapidly changing and uncertain technological environment. Resource sharing under the circumstances plays a pivotal role (Murthy, 2015). In the same method, Gorman (2001) presented the capacity of the libraries to offer access to digital and electronic information sources despite the consequences of location and immediate delivery of library services in terms of “virtual library”, “electronic library” or “digital library” (Gorman, 2001).

While TS is well documented in libraries the world seems uninformed of library work as computer related (Clute, 1998). Excitingly, Poole and Emmett (2001) clarified that the 1994 job rated almanac categorized librarianship among the 25 least stressful occupations, thereby strengthening a publicly held image that library work is not a technological field (Poole & Denny, 2001).

Libraries are part of society and reflect changes that take place in that society. At the close of the twentieth century,

electronic technology has permeated all facets of daily life. Though, in the process of become accustomed to the increasingly complex technologies, more users and staff have been experiencing physical and emotional stress (Saunders, 1999).

Ofua & Tiemo (2011) found that techno stress could be avoided by librarians, by taking the following measures: purchasing user friendly interface software, regular staff training on ICTs, and developing positive attitude toward technology, and so forth (Ofua & Tiemo, 2011). This resulted in higher level of absenteeism and turnover, higher cost for retaining new staff and increase in litigation costs related to workplace stress (Harper, 2000). Bichteler (1986) discovered that as a result of library automation some librarians feel that their personalities has changed, in which they became more computer oriented. They were easily irritated and impatient when dealing with unorganized or illogical people and found it hard to communicate with non-programmers (Bichteler, 1986). The pressure to use the equipment efficiently and to stay on schedule has reduced their opportunities for conversation and let them to isolate themselves from other people. Moreover, the librarian also felt frustrated when there is incapability

between micros and mainframe, inaccessible and unhelpful sales representative, lacking of training and inadequate time provided to practice what they have learned(U. Ahmad, Amin, & Ismail, 2009).

Due to technological advancement in the organization, the library is among the organizations that are affected with techno stress. Though technology in the library has helped increase the effectiveness of information management, it has also caused an enormous amount of strain on librarians (Bichteler, 1986; Davis-Millis, 1998; Kupersmith, 2003). In general, librarians welcome automation and show positive attitudes towards technological change in the libraries; at the same time, librarians do expressed concern with regards to the negative repercussions brought about by the technological change(Al-Qallaf, 2006; Poole & Denny, 2001). According to Van Fleet and Wallace (2003), the introduction of technology in the library has caused some librarians to suffer loss of personal identity, have resource challenge, and feel more vulnerable(Van Fleet & Wallace, 2003).

Moreover, a survey by Kupersmith (2003) revealed that a majority of library staff felt that their level of techno stress has

increased over the years. In fact, most of them regarded the computer-related stress they experienced are causing serious threat(Kupersmith, 2003).

Recent research also show that techno stress is still a growing phenomenon among the librarians(U. Ahmad, Amin, & Ismail, 2014). According to Mahalakshmi and Sornam (2011), one of the factors that Meaningfully influence techno stress level experienced by the librarians is the ergonomic factor(Mahalakshmi & Sornam, 2011). Though Asghar (2012) agreed that inappropriate infrastructure do cause techno stress among academic librarians, she also outlined that fear of virus, feeling that privacy is being invaded and delicateness of storage media are among other sources of techno stress in the libraries. Ahmad (2012) also found that academic librarians in the Malaysian public universities do experience techno stress in their workplace. Specifically, they were found to experience high level of uncertainty and feeling of work overloaded due to the usage of technology(U. N. U. Ahmad & S. M. Amin, 2012). In Nigeria, technostress was found to be one of the determinants of job burnout among university librarians(Francis et al., 2013). According to Majchrzak and Cotton

(1988), technological change that resulted in role ambiguity and role overload would lead to negative attitude change. Consequently, employees' commitment towards their organizations might be also affected (Majchrzak & Cotton, 1988). In medical libraries, users (staff and the clientele) can be negatively affected by new technologies, and affect on management factors (work relationships, work redundancy, technical support, job uncertainty and job security, and this in turn can affect techno-stress on them.

LITERATURE REVIEW

A number of technostress creators have been identified. Exploration on the literature of technostress by Clute (1998) pointed out that the top three reasons of technostress are inexperienced with computers, performance anxiety and lack of training. In addition, Clute also found out that the common causes of technostress in workplace include lack of participatory management styles, ineffectiveness of communication and inadequacy of employees involvement. From the study conducted by Al-Qallaf (2006) on the effect of technology on librarians in the academic and research libraries in Kuwait, it was found that the lack of formal training was ranked as the number one cause of

technostress. She also revealed that most of the respondents were not satisfied with the quality of the training programs. The importance of training is also supported by Poole and Denny (2001), as well as Quinn (2007), who agreed that training should be one of the critical elements in overcoming technostress.

Raitoharju (2005) discovered six ways on how technology creates stress in the workplace based on the literature reviews on stress and the role of information technology as a source of stress. Other than the change brought about by the implementation of technology, technology also can be seen as adding pressure for more effective performance, increasing the amount of information to the extent of information overload, causing anxiety due to the ever frequent change in technology, putting more demand on technical skills as skills needed to be upgraded frequently following technological change, and reducing social support since usage of technology usually result in virtual organizations and distance working (Raitoharju, 2005).

Tarafdar et al. (2007) described technostress as a problem of adaptation as a result of a person's inability to cope with or get used to information and communication

technologies (ICT). These researchers developed five components of technostress which are described as:

a) Techno-overload A condition where ICT users are forced to work with high-speed and in an extended time.

b) Techno-invasion A condition where ICT users feel that they can be contacted anytime or continuously connected which caused an unclear boundary between work-related and personal contexts.

c) Techno-complexity A condition where the ICT users feel that their skills are insufficient due to the difficulty related to ICT. As a result, they are strained to use up time and effort to study and understand the diverse features of ICT.

d) Techno-insecurity A condition where ICT users feel threatened that they will lose their job, either being reinstated by the new ICT or by other people who are better in ICT compare to them.

e) Techno-uncertainty A condition where the ICT users feel hesitant and disturbed since ICT is endlessly shifting and need upgrading (Tarafdar, Tu, Ragu-Nathan, & Ragu-Nathan, 2007).

MATERIALS AND METHODS

Item Development and Questionnaire Design. In developing the scales for techno

stress creators, we first conceptualized questions based on the literature. Content validation involves from 20 associate and professor in knowledge and information sciences from different universities of Iran. During these correspondence by email, we asked them to comment on the relevance and clarity of the questions within the context of techno stress situations and associated organizational response mechanisms as they experienced them. Based on their feedback, we developed the questionnaire.

A total of 70 academic librarians from Mazandaran and Babol University of Medical Sciences became the respondents for this study. The instrument included of 23 items which were grouped into five dimensions. These dimensions were techno-overload, techno-invasion, techno-uncertainty, techno-complexity, and techno-insecurity.

All items of technostress were measured on a five-point Likert scale: from 1 ("strongly disagree") to 5 ("strongly agree").

The Levels of techno stress were measured by computing the mean scores of these variables. Using a 5-level mean score scale developed by Ahmad (2010), the level of techno stress experienced is interpreted (U. N. U. Ahmad, 2010) as in table 1.

Table 1: A 5-level Mean Score Scale

Mean	Level
1.0-1.80	Very low
1.81-2.60	Low
2.61-3.40	moderate
3.41-4.20	high
4.20.5.0	Very high

RESULTS

Table 2. Distribution and percent of respondents by demographic factors

Item	Variable	F	%	Item	Variable	F	%
Gender	Female	43	64	Age(Years)	20-25	2	3
	Male	23	36		26-30	7	11
	Total	66	100		31-35	8	12
					36-40	12	18
				40 years ad more	37	56	
Education	Diploma or less	5	8	Employment Type	Predetermined	4	6
	AS	7	11		Contract	23	35
	BS	35	53		Official-experimental	3	5
	Master's degree or higher	19	19		Official	36	54
	Total	66	100		Total	66	100
Work experience(Year)	Less than 5	9	14				
	Between 1 to 5						
	Between 5 to 10	12	18				
	Between 10 to 15	6	9				
	15 years and more	37	56				
	Total	2	3				
	66	100					

Table 3: Level of Technostress

Dimensions	Very low		low		moderate		high		Very high	
	F	%	F	%	F	%	F	%	F	%
techno-overload	-	-	-	-	3.14	.68	-	-	-	-
techno-invasion	-	-	2.26	.65	-	-	-	-	-	-
techno-uncertainty	-	-	-	-	2.80	.71	-	-	-	-
techno-complexity	-	-	2.37	.61	-	-	-	-	-	-
techno-insecurity	-	-	-	-	3.28	.81	-	-	-	-

Table 4. Description of the technostress questions and each of its components

Variables	MD	SD
techno-overload	3.14	.68
techno-invasion	2.26	.65
techno-uncertainty	2.80	.71
techno-complexity	2.37	.61
techno-insecurity	3.28	.81
Techno-stress	2.77	.38

Table 5. One-sample t-test: the technostress and each of its components

Variables	Calculated T	DF	Critical T	α	P-Value
techno-overload	1.56	65	2.000	0.05	0.103
techno-invasion	-9.16	65	2.000	0.05	0.000
techno-uncertainty	-2.19	65	2.000	0.05	0.031
techno-complexity	-8.27	65	2.000	0.05	0.000
techno-insecurity	2.80	65	2.000	0.05	0.007
Techno-stress	-4.37	65	2.000	0.05	0.000

CONCLUSION

The first question, how is the technostress and each of its components in the Mazandaran Universities of Medical Sciences in Mazandaran province?

Mean of technostress variable indices 2.77 is less than the theoretical mean

Which indicates, viewpoint of the descriptive, technostress among librarians of Mazandaran University of Medical Sciences in Mazandaran Provinces is relatively low. T calculated in component of techno-overload, techno-invasion, techno-complexity, techno-insecurity, technostress is smaller than Critical T (2.000) and component of techno-uncertainty is less than critical t(2.000)

Therefore, it is concluded that the technostress of each of its components is less than average. The result of the first question showed that technostress among librarians is less than normal, it can be deduced librarians used to the advent of technology and cope with the rapid changes and can not cope

well with some of its components, In particular, techno-uncertainty which make librarians in doubt and stress that they claim and cause fatigue and tension in them and can affect them. This outcome is align with the result of (Rafihi Nasab, Rajabi, & Sabbaghi Nezhad, 2014) and (U. Ahmad & S. M. Amin, 2012), and is not consistent with results (Sobhani Nezhad, Nourouz, Amani Sari Begloo, & Hayat, 2010).

RECOMMENDATIONS BASED ON FINDINGS

- 1- Managers for reducing technostress among library staff, must provide friendly environment without stress for them.
- 2- It is recommended to the library management and headquarters to invite IT experts, holding seminars, and Background briefings for library staff to explain the benefits of new technologies and teach them new IT skills.

- 3- It is recommended to the library management and headquarters, during the year on several occasions by inviting experts to the teach librarians and mechanisms to strengthen self-esteem, creativity and self-confidence and followed feedback on their job performance.
- 4- It is recommended to the library management and headquarters with the installation in the halls and corridors of the library and prepare them for advantages and disadvantages due to new technologies.

SUGGESTIONS FOR FUTURE RESEARCH

1. The effect of techostress on job motivation of librarians
- 2) the relationship between technostress and job stressors of librarians
- 3) the relationship between technostress and mental health of librarians
- 4). The effect of technostress on organizational library productivity
- 5). The effect of organizational commitment on organizational behavior of librarians
- 6). The effect of organizational commitment on job satisfaction of librarians.

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REFERENCES

- Ahmad, U., Amin, S., & Ismail, W. (2009). The impact of technostress on organisational commitment among Malaysian academic librarians. *Singapore Journal of Library and Information Management*, 38, 103-123.
- Ahmad, U., & Amin, S. M. (2012). The Dimensions of Technostress among Academic Librarians. *Procedia - Social and Behavioral Sciences*, 65(0), 266-271. doi: <http://dx.doi.org/10.1016/j.sbspro.2012.11.121>
- Ahmad, U., Amin, S. M., & Ismail, W. K. W. (2014). Moderating Effect of Technostress Inhibitors on the Relationship between Technostress Creators and Organisational Commitment. *Jurnal Teknologi*, 67(1), 51-62.
- Ahmad, U. N. U. (2010). Technostress and Organisational Commitment Among Librarians in the Malaysian Public Higher Learning Institutions. (Ph.D.), Universiti Teknologi Malaysia, Malaysia.

- Ahmad, U. N. U., & Amin, S. M. (2012). The Dimensions of Technostress among Academic Librarians. *Procedia - Social and Behavioral Sciences*, 65(0), 266-271. doi: <http://dx.doi.org/10.1016/j.sbspro.2012.11.121>
- Al-Qallaf, C. L. (2006). Librarians and technology in academic and research libraries in Kuwait: perceptions and effects. *Libri*, 56(3), 168-179.
- Ayyagari, R., Grover, V., & Purvis, R. (2011). Technostress: technological antecedents and implications. *MIS quarterly*, 35(4), 831-858.
- Bichteler, J. (1986). Human Aspects of High Tech in Special Libraries. *Special Libraries*, 77(3), 121-128.
- Brod, C. (1984). Technostress: The human cost of the computer revolution (Vol. 13): MA Addison-Wesley Reading,.
- Carayon, P., Hancock, P., Leveson, N., Noy, I., Sznalwar, L., & van Hootegem, G. (2015). Advancing a sociotechnical systems approach to workplace safety—developing the conceptual framework. *Ergonomics*(ahead-of-print), 1-17.
- Champion, S. (1988). Technostress: Technology's toll. *School Library Journal*, 35(3), 48-51.
- Clute, R. (1998). Technostress: A Content Analysis-Unpublished master's thesis. (Master), Kent State University.
- Davis-Millis, N. T. (1998). Technostress and the Organization: A Manager's Guide to Survival in the Information Age. 14 February. Paper presented at the The 67th Annual Meeting of the Music Library Association.
- Ennis, L. A. (2005). The Evolution of Technostress. *Computers in libraries*, 25(8), 10-12.
- Fischer, T., & Riedl, R. (2015). Theorizing Technostress in Organizations: A Cybematic Approach In thomas. O.; Tetueberg, F(Hrsg). Paper presented at the Proceedings der 12th international conference on wirtschaftssinformatik (W1, 2015) Osnabruck.
- Francis, O., Oluwole Olalude, F., & Popoola, S. O. (2013). Work Values, Achievement Motivation and Technostress as Determinants of Job Burnout among Library Personnel in Automated Federal University Libraries in Nigeria. *Library Philosophy and Practice*(e-journal). Paper, 919(15), 1-31.
- French, J. R., Caplan, R. D., & Van Harrison, R. (1982). The mechanisms of job

- stress and strain (Vol. 7): Chichester [Sussex]; New York: J. Wiley.
- Gorman, M. (2001). Technostress and Library Values. *Library Journal*, 126(7), 48-50.
- Harper, S. (2000). Managing technostress in UK libraries: a realistic guide. *Ariadne*, 25, 18-12.
- Hudiburg, R. A. (1995). Psychology of computer use: XXXIV. The computer hassles scale: Subscales, norms, and reliability. *Psychological Reports*, 77(3), 779-782.
- Jena, R. (2015). Technostress in ICT enabled collaborative learning environment: An empirical study among Indian academician. In Press. *Computers in Human Behavior*.
- Korunka, C., Huemer, K., Litschauer, B., Karetta, B., & Kafka-Lützow, A. (1996). Working with new technologies: hormone excretion as an indicator for sustained arousal. A pilot study. *Biological Psychology*, 42(3), 439-452.
- Kupersmith, J. (2003). Library technostress survey results. Retrieved 8 May 2015, from <http://www.jkup.net/tstress-survey-2003.html>
- Laspinas, M. L. (2015). Technostress: Trends and Challenges in the 21st Century Knowledge Management. *European Scientific Journal*, 11(2), 205-217.
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. New York: McGraw Hill.
- Liu, Y., & Wang, K. (2011). Technostress of IT professionals: diverse for different personality type and related to different career orientations. June 24-25, 2011. Paper presented at the The Fifth China Summer Workshop on Information Management (CSWIM 2011) China. <http://2011.cswimworkshop.org/docs/CSWIM2011-Proceedings.pdf>
- Mahalakshmi, K., & Sornam, S. A. (2011). Ergonomics and Technostress among Library Professionals of Engineering Colleges of Anna University. *Singapore Journal of Library & Information Management*, 40, 89-102.
- Majchrzak, A., & Cotton, J. (1988). A longitudinal study of adjustment to technological change: From mass to computer-automated batch production. *Journal of occupational psychology*, 61(1), 43-66.

- Murthy, T. A. V. (2015). Library Automation. Retrieved May 08 2015, 2015, from http://ir.inflibnet.ac.in/bitstream/1944/170/2/03cali_1.pdf
- Ofua, O. J., & Tiemo, P. A. (2011). Technostress: Effects and Measures Among Librarians in University Libraries in Nigeria. *IJDLS2*, 4, 24-33.
- Poole, C. E., & Denny, E. (2001). Technological change in the workplace: A statewide survey of community college library and learning resources personnel. *College & Research Libraries*, 62(6), 503-515.
- Rafihi Nasab, F., Rajabi, G., & Sabbaghi Nezhad, Z. (2014). study of relationship of technostress and personality type of librarians in Shahid Chamran University of medical sciences and Shaeid Chamran University in Ahwaz [Persian]. Paper presented at the Second National Conference on Psychology and Behavioral Sciences, Iran. http://www.civilica.com/Paper-PSYCHOCONF02-PSYCHOCONF02_091.html
- Ragu-Nathan, T., Tarafdar, M., Ragu-Nathan, B. S., & Tu, Q. (2008). The consequences of technostress for end users in organizations: Conceptual development and empirical validation. *Information Systems Research*, 19(4), 417-433.
- Raitoharju, R. (2005). Information Technology-Related Stress. Paper presented at the. 28th Information System Research Seminar in Scandinavia (IRIS28). Paper presented at the The 28th Information System Research Seminar in Scandinavia a (IRIS28) August 6-9, 2005, Kristians and, Norway.
- Riedl, R. (2012). On the biology of technostress: literature review and research agenda. *ACM SIGMIS Database*, 44(1), 18-55.
- Saunders, L. M. (1999). The human element in the virtual library. *Library trends*, 47(4), 771-787.
- Sobhani Nezhad, M., Nourouz, A., Amani Sari Begloo, J., & Hayat, A. (2010). Clarify the role of organizational support, experience, stress and self-efficacy in predicting computers, computer application. *Journal of Educational Psychology Study*, 7(11), 48-65(Persian).
- Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. (2007). The impact

- of technostress on role stress and productivity. *Journal of Management Information Systems*, 24(1), 301-328.
- Tarafdar, M., Tu, Q., & Ragu-Nathan, T. (2010). Impact of technostress on end-user satisfaction and performance. *Journal of Management Information Systems*, 27(3), 303-334.
- Tu, Q., Wang, K., & Shu, Q. (2005). Computer-related technostress in China. *Communications of the ACM*, 48(4), 77-81.
- Van Fleet, C., & Wallace, D. P. (2003). Virtual Libraries-Real Threats: Technostress and Virtual Reference.(from the Editors). *Reference & User Services Quarterly*, 42(3), 188.
- Vieitez, J. C., Carcía, A. D. L. T., & Rodríguez, M. T. V. (2001). Perception of job security in a process of technological change: Its influence on psychological well-being. *Behaviour & Information Technology*, 20(3), 213-223.
- Weil, M. M., & Rosen, L. D. (1997). *Technostress: Coping with technology@ work@ home@ play*. New York: John Wiley and Sons.
- Wiener, N. (1948). *Cybernetics. Or, Control and Communication in the Animal and the Machine*. . New York (1948) Wiley,The Technology Press.
- World Health Organization: Global health risks. (2009). *Mortality and Burden of Disease attributable to selected Major Risks*. Geneva, Switzerland: World Health Organization.
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