

How Managers are Related To Techno-Stress in Organization

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Abstract

Background: Technology has made the quality of health care evolve, and widely deployed in healthcare service systems, but the entrance of technology to a defective system would intensify the same problems and the stress resulting from its application to users, which is called "Techno-stress".

Objectives: This study aimed to assess the relationship between Technology Management and Techno-stress level among nurses. Data were analyzed using mean, standard deviation, Pearson and linear regression in SPSS 16.

Methods: This survey was conducted to evaluate the frequency, intensity and levels of "Techno-stress and its dimensions" and "Technology Management by Two validated questionnaires.

Results: The mean score of Techno-stress in the studied samples (195 registered nurses) was 51.55 ± 15.607 (highest mean score in the field of feeling pressure and the lowest mean score in the technology involving). In addition, there was a significant correlation Technology Management and the Techno-stress score ($r = -0.242$, $p < 0.001$). In addition, the highest correlation between the score of the Technology Management and the feeling stress ($r = 0.422$, $p < 0.001$).

Implication Conclusions: Nurses experience an overall relative Techno-stress and this related to nursing how managers do about technology. Nursing managers of medical centers need to plan to eliminate the stress caused by the use of technology and better management in order to eliminate and prevent the Techno-stress.

Keywords: techno-stress, nursing administration, technology assessment, technology

Introduction

For many years, technology has left a significant impact on the development of human relations and the progress of human civilization. Nowadays, technology has entered all aspects of human life whose great changes that are done every day, has influenced the human life more than ever. Hence, many of us are learning to use the technology that is changing our workplace and making communication easier [1,2]. Technology is regarded in many cases as a factor of progress and structural changes at organizational and national scales. According to Simatupang citing to

Steel, technology should have a central role in the strategic planning of each organization to improve its services or to use the new services or to compete with other organizations [3].

Like other systems in the community, healthcare systems are growing rapidly and the application of technology is gradually growing and unavoidable, turning more attention to focus on health technology at the beginning of this century [4]. In line with community-wide health promotion, technology and communications have made changes in the quality of healthcare. On the other hand, technology is quickly changing

healthcare system [5]. As [6] and different professions in healthcare organizations are forced to use it as a promotion of the health care services offered to the recipients. The nurses are also dramatically impressed by healthcare and information technologies [6,7].

Due to the shortage of human forces in the nursing profession, and the growing number of patients, technology would support nurses to improve their performance quality. Technology, being combined with nursing, would NOT be capable to modify nurses' performance main elements; such as: gathering information, planning, intervention, evaluation, training, support, documentation, communication and interaction; but they are just expected to be improved. Participation of technology in healthcare means that there is no nurse who does NOT use the technology in the professional activities [8]. More and more use of health technology implies that nurses and other healthcare providers need more information about technology and it is clear that more comprehensive information about technology promotes its application in patient care, quality, security, and reduces care costs [9]. Systems related to the establishment and development of real time locating system, support and logistics related to the patient, such as: patient discharge, moving into the residence location, education, etc., which are connected to some of the main roles of nurses and especially community health nurses[10], and the hospital management and leadership; are examples of technology used in nursing [11].

What is Techno-stress?

Computers and communication technology have given us many more options for getting our work done. Yet we feel inundated by technology. Recent studies have shown that that user experience Techno-stress as a result of their use of technology in the organizational context [12,13]. Some of these most important complications are mental tension and stress caused by the application of technology that it called "Techno-stress". Other terms used for this purpose are "techno-phobia", fear of technology, and "technology aversion" [14]. This concept was invented in 1984 by a clinical psychologist. In clear words, it can be concluded that Techno-stress is a modern predicament caused by inability

to adapt to the modern technologies, which is actually a combination of performance anxiety, a mass of information, conflict of roles, and organizational factors[15]. According to Akhtari in another definition, Techno-stress is a negative mental image of a modern technology [16]. Davis believes that Techno-stress is an illness one contract when they try to adapt to modern technology. Therefore, Techno-stress is a result of a new and increased fear, or of the difficulties associated with computers or any other modern equipment which significantly increase the stress amongst the staff (generally nurses, in this study). That's because they are commonly expected to use this modern technology through a set of daily routine despite of inadequate familiarity; which leads to imposing additional repetitive stress [17]. Techno-stress is a global phenomenon and countries like the United States, China and Australia have expressed its prevalence in different percentages (25- 39%) amongst their subsidiary organizations [16]. Much of existing research in Techno-stress provides a broad and general theoretical foundation for analyzing the phenomenon, primarily articulating different creating conditions and general adverse manifest effects [18].

Techno-stress has five different dimensions, including:

- 1) Techno-overload, which describes situations where technology forces users to work faster and longer.
- 2) Techno-invasion, which describes the invasive effect of technology in situations where employees can be reached anytime while they feel the need to be constantly connected, thus blurring work-related and personal contexts.
- 3) Techno-complexity, which describes situations where the complexity associated with technology leads users to feel inadequate with regard to their computer skills and forces them to invest time and effort in learning and understanding the technologies.
- 4) Techno-insecurity, which is associated with situations where users feel threatened about losing their jobs, either because of automation from technology or to other people who have a better understanding of technologies.
- 5) Techno-uncertainty, which refers to contexts where continuing technology changes and upgrades, unsettles users and creates uncertainty,

so that they need to constantly learn and educate themselves about new technologies [12,17].

Some of the main reasons for Techno-stress are insufficient experiences and skills, and feeling abhorrence of seeming obtuse, and also, performance anxiety, lack of training, organizational factors, enormous amounts of labor and information, quick changes and insufficient number of staff [19].

According to studies, a person experiences stress as an internal feeling when they are exposed to new technology; but some physical symptoms also occur, such as: increased mistakes and absence from work, depressed mood, lack of confidence, frustration, irritability, anger, fatigue and lack of concentration [15]. And since the nurses have the role of caring for physical and mental patients, they need to think about their health. Since there was no previous study in this regard, this research was carried out with the aim of investigating the Techno-stress in nurses.

Methods

This study used a descriptive, correlational design to identify the related factors of Technology Management to Techno-stress. The theoretical framework was formed on the basis of previous studies on the subject [17,20].

Nurses recruited from 11 hospitals affiliated to the Isfahan University of Medical Sciences and were at least two years' work experience in the hospital. The sample size was calculated to be a minimum of 195 individuals and number of participants was determined for each hospital through the quota sampling, and then, the required number of participants in each hospital was randomly selected. The researcher prepared a list of the hospitals affiliated to Isfahan University of Medical Sciences, and then, according to the nursing staff of each center, the required sample size was determined (the number of nurses per facility was divided by the total number of the nurses of all the centers and multiplied by the sample size). The data were collected in each center, a list of nursing staff of that center was obtained from the human resources department, and based on the number of the nursing staff, the number of the participants to fit each group was determined using sample software (S-Plus version 6.2, Insightful Corporation, Seattle, WA, USA) via random sampling method. It should be noted

that, in certain centers, due to lack of cooperation of managers or nursing staff, the required number of samples was not obtained which was compensated by other centers.

After obtaining written consent forms from the participants, several meetings were held with the nurses to explain the purpose of the study and describe the questionnaire. Participation in the survey was voluntary and anonymity was ensured. Approximately 15–20 minutes were required to complete the questionnaire. The questionnaires were delivered and then collected by the investigator in charge of the study one day later.

The techno-stress scale, developed in previous studies [16,17], was used to measure the Techno-stress. It is composed of five main dimensions: Techno-overload (4 items), Techno-Invasion (3 items), Techno-Complexity (5 items), Techno-Insecurity (4 items), Techno-Uncertainty (4 items). The participants were asked to assess each situation, according to its frequency on a Likert scale ranging from 1 to 5 where 1 = completely disagree and 5 = completely agree. The total scores for Techno-stress ranged from 0-100, and classified to 0-33.3 as low stress, 33.4-66.6 as moderate stress, and 66.7-100 as high stress. The Cronbach's alpha coefficient for the questionnaire was 0.824 for the Persian version.

To assess Technology Management, the Technology Management tool for Iranians, developed by Adel-Mehraban et al. (2015). The toolkit questionnaire derived from the previous study and was used study (Chronbach α =0.89 and CVI= 0.93). The Technology Management tool comprised 18 items. The participants were asked to assess each situation according to its frequency on a Likert scale ranging from 0 to 4 where 0 = never and 4 = very frequently, and 0 = no intensity and 4 = to a great extent, respectively. The total score ranges from 0 to 72. The more scores show better technology management.

Data were analyzed using descriptive and analytical tests (mean, standard deviation, Pearson and linear regression) in the Social Sciences software (version 16, SPSS Inc., Chicago, IL, USA).

Before performing this research, an official license with number 393830 was obtained from research ethics committee in order to considering moral standards in this study. Furthermore, written consent was obtained from all units, and

all of them were given reassurance about the confidentiality. Before performing this research, an official license was obtained from the Research Ethics Committee of Esfahan Medical Sciences University in order to consider moral standards in this study. Furthermore, written consent was obtained from all participants, and all of them were given reassurance about their data confidentiality.

Results

A total of 195 nurses were invited to take part in the study (5 incomplete questionnaire replaced by other random sampling). 171(87.7%) of the participants were female, with an average age of (30-40) years old. The mean working experience was 16(10-15) years. Most of the individuals had a Bachelor degree, and 72.3% of the sample had variable shifts of whom the largest group, regarding recruitment status, where the temporary with a proportion of 85(43.6%). (see Table 1).

Table 1: Demographic characteristics of Nurses

Traits	Divisions	Frequency	Frequency Percentage
Age	20- 30	48	24.6
	30- 40	98	50.3
	40- 50	43	22.1
	More than 50	6	3.1
Gender	Male	24	12.3
	Female	171	87.7
work experience	Less than 5 years	33	16.9
	5-10 years	60	30.8
	10- 15 years	57	29.2
	More than 15 years	45	23.1
Appointment	Nurse	176	90
	Nurse managers	19	10
Education level	Registered nurse	185	95
	Master of nursing	9	4.5
	Doctor of Medicine	1	0.5
Shiftwork	Day, evening, night shift	141	72.3
	Only day shift	54	27.7
Employment Status	Permanent recruitment	48	24.7
	Semi-permanent recruitment	62	31.7
	Contracted recruitment	85	43.6

Also the results of the research showed (see Table 2) that the mean total score of Techno-stress in the studied units was (51.55 ± 15.07), so the amount of Techno-stress was calculated in the

moderate range. The highest score was in the Techno-overload dimension (58.4 ± 21.53), and the lowest score in the Techno-Invasion dimension of Techno-stress (45.34 ± 23.24).

Table 2: Techno-stress' dimensions (mean score and standard deviation)

Techno-stress dimensions	Mean	Standard deviation
Techno-overload		
I1-1-I am forced by this technology to work much faster.		
I1-2-I am forced by this technology to do more work than I can handle.	58.4	21.53
I1-3-I am forced by this technology to work with very tight time schedules.		
I1-4-I am forced to change my work habits to adapt to new technologies.		
I1-5-I have a higher workload because of increased technology complexity.		
Techno-invasion		
I1-8-I spend less time with my family due to this technology.		
I1-9-I have to be in touch with my work even during my vacation due to this technology.	45.34	23.24
I1-10-I have to sacrifice my vacation and weekend time to keep current on new technologies.		
I1-11-I feel my personal life is being invaded by this technology.		
Techno-complexity		
I1-12-I do not know enough about this technology to handle my job satisfactorily.		
I1-13-I need a long time to understand and use new technologies.		
I1-14-I do not find enough time to study and upgrade my technology skills.	55.17	16.9
I1-15-I find new recruits to this organization know more about computer technology than I do.		
I1-16-I often find it too complex for me to understand and use new technologies.		
Techno-insecurity		
I1-17-I feel constant threat to my job security due to new technologies.		
I1-18-I have to constantly update my skills to avoid being replaced.		
I1-19-I am threatened by coworkers with newer technology skills.	44.83	16.9
I1-20-I do not share my knowledge with my coworkers for fear of being replaced.*		
I1-21-I feel there is less sharing of knowledge among coworkers for fear of being replaced.		
Techno-uncertainty		
I1-22-There are always new developments in the technologies we use in our organization.		
I1-23-There are constant changes in computer software in our organization.	-59.8	16.8
I1-24-There are constant changes in computer hardware in our organization.		
I1-25-There are frequent upgrades in computer networks in our organization.		
Total	51.55	15.07

In addition the mean Technology Management score is 56.5. According to Table 3, the Pearson correlation coefficient shows that there is a reverse relationship between the Technology Management and the total Techno-stress score

($r = -0.42$, $p < 0.001$). As seen the highest correlation coefficient was found between Technology Management and the Techno-overload dimension of Techno-stress ($p < 0.001$, $r = 0.428$).

Table 3: Pearson Correlation Coefficient value in Technology Management score (56.5) and Techno-stress Dimensions Score

Techno-stress Score and its Dimensions	p-value	r
total	0/425	001/0>
Techno-overload	-0/428	001/0>
Techno-Invasion	-0/411	001/0>
Techno-Complexity	-0/285	001/0>
Techno-Insecurity	-0/191	/0>008
Techno-Uncertainty	-0/310	001/0>

The findings of the present study indicate a relative high level of Techno-stress among nurses working in hospitals affiliated to the Isfahan University of Medical Sciences. The results of this study indicates that lack of motivation and

excessive concentration in organizations increase techno-stress. This study shows that the Technology Management have a positive relationship with techno-stress ($P < 0.05$).

Discussion

The current study revealed that Technology Management is at a moderate level satisfaction. the most factors that have been studied in this study about Technology management by using technology, quality management questionnaire were: the necessity of technology application, the expected performance of technology, the correct process of purchase, the availability of technology and support services presence, proper technology application, periodic supervision of managers on the application of technology, the autonomy of nurses in the application of technology, and proper maintenance.

Other studies also show that nurses, and even nurse educators essentially suffer from stress associated during working with various technologies [21], and the nurses who use too much technology have experience more techno-stress (Nolin, 2015). In addition, techno-stress is high in many organizations due to the lack of skill, anxiety, abundance of information, the speed of changes in systems, high demand and high workload against high power shortages [15]. On the other hand, according to studies, compulsory use of technology has led to the emergence of techno-stress in individuals and needs to be considered in Technology Management. There is also a significant negative relationship between techno-stress and life satisfaction[22].

The results of this study indicate that the process of technology management in the current setting, faces great challenges. One of the common mistakes in using the new technology is the idea of the completion of the project. Although some work may have been completed, but the deployed system requires continuous attention to ensure that technology is accepted and maximized its efficiency and continuous improvement. The constant monitoring of the application of technology is not only a way of continuously developing the system, but also it is necessary to achieve its goals. Providing the formal feedback process for solving user's problems and answering their questions is a best way to make optimum use of technology [23,24]. Therefore, the main issue in the successful technology management at different levels and areas is the role Effective managers explain this area.

Finally, the successful application of technology is a result of its good leadership. Nursing, Nursing managers' roles are required at each stage of the application of the technology, and the managers who themselves deeply involved with this process and planning for it will surely have good results. In this regard, the results of this study showed that there is a reverse relationship between the quality of the Technology Management and the overall Techno-stress score ($r = -0.453$, $p < 0.001$). As can be seen, the highest correlation coefficient existed between the score of Technology Management quality and Techno-overload dimension of techno stress ($p < 0.001$, $r = 0.428$, $p < 0.05$). Therefore, if Technology Management is better done, the amount of Techno-overload will be significantly reduced.

The results of previous studies also show that attention to the technology management can lead to techno-stress reduction. Proper education and support employee will be effective in inhibition of techno-stress and can play key role in reducing Techno-Stress and help in the technology learning process [12].

In agreement with previous studies conducted in specific settings, this research has also shown that, giving nurses a chance during their decision The change, or the implementation of technology, leads to more appropriate decisions that increase efficiency and reduce techno-stress among nurses. Getting feedback from nurses who are in the first line of patient care can lead to a better understanding of managers of workflow system and the selection of technology tailored to the individual needs of the staff. Therefore, the efficiency of nurses when increasing that they feel better about using technology, and this leads to increased patient safety, more patient satisfaction and a significant reduction in health care costs, and more nurses' adaptation.

Conclusion

By our research, it could be mentioned that the arrival of technology in the healthcare workplaces causes negative emotions in the nurses. Other studies also confirmed the statement that considers the emotions and reactions of users plays a major role in survival of technology in organizations; and this is economically more reasonable. Therefore, senior nursing officers and hospital deans should plan appropriately to

confront tech-stress in order to make optimum use of technology and reach high quality healthcare in workplaces.

These results can be partly explained by the fact that the technology management is a crucial role in technology application and reducing techno-stress among the users. Technology benefits depend on the environment in which it is used, not the amount of money spent, and applying it Correct and effective.

On the one hand, healthcare setting must adapt to the rapid changes and technological advancements, provide safe and high quality care, and be careful about the effects of technology to human aspects, of its use. Also, attention to the emotions and reactions of technology users in the correct use of it, plays a decisive role in the survival of technology in any organization. The lack of attention to the responses and feelings of nursing staff (who have the closest connections to patients in healthcare setting) may lead to poor quality care, impose costly burdens on the system, cope with the technology and, at the end, eliminate it.

Finally, nursing managers can focus on the factors that create nurses' techno-stress (one of the most important responses of users about technology in today's time), in an environment that is bound to be confronted with technologies that are constantly evolving and changing the plan to use optimal technology as well as provide quality care.

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Conflict of interest

The author declares no conflicts of interest.

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