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## ORIGINAL PAPER

# Implementation of Internet Training on Posture Reform of Computer Users in Iran

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## ABSTRACT

**Background and Purpose:** Musculoskeletal disorders are of common problems among computer (PC) users. Training of posture reform plays a significant role in the prevention of the emergence, progression and complications of these diseases. The present research was performed to study the effect of the Internet training on the posture reform of the Internet users working in two Iranian universities including Sistan and Baluchestan University and Islamic Azad University of Zahedan in 2014. **Materials and Method:** This study was a quasi-experimental intervention with control group and conducted in two Iranian universities including Sistan and Baluchestan University and Islamic Azad University of Zahedan. The study was done on 160 PC users in the two groups of intervention (80 people) and control (80 people). Training PowerPoint was sent to the intervention group through the Internet and a post test was given to them after 45 days. Statistical software of SPSS 19 and statistical tests of Kolmogorov, *t*-test, Fisher Exact test, and correlation coefficient were used for data analysis. **Results:** After the training, the mean scores of knowledge, attitude, performance and self-efficacy in the intervention group were  $24.21 \pm 1.34$ ,  $38.36 \pm 2.89$ ,  $7.59 \pm 1.16$ , and  $45.06 \pm 4.11$ , respectively ( $P < 0.001$ ). The mean scores of knowledge in the intervention group  $5.45 \pm 2.81$  and in the control group  $1.20 \pm 1.07$  showed a significant change. Mean scores of attitude in the intervention group  $3.60 \pm 3.59$  and in the control group  $0.48 \pm 1.03$  showed a significant change as well. Mean scores of self-efficacy in the intervention group  $14.83 \pm 4.67$  and in the control group  $0.88 \pm 1.93$  indicated a significant change and mean scores of performance in the intervention group  $5.28 \pm 1.24$  and in the control group  $0.62 \pm 0.73$  indicated a significant change ( $P < 0.001$ ). **Discussion:** The results of the study showed that training through the Internet had a significant impact on the posture reform of the PC users. According to the findings observed, there was a significant relationship between the scores of self-efficacy-performance after training. Therefore, based on the findings of the study, it is suggested that Internet training to increase self-efficacy approach in the successive periods can be effective to reform the postures of PC users.

**Key words:** Training, Internet, PC users, Self-efficacy.

## 1. INTRODUCTION

Knowledge and technology advances in the past century caused widespread economic growth in most industrialized countries. Today, material wealth is the outcome of the application of technical knowledge and more than anything else knowledge in science and technology, in this context what matters the most in relation to social progress along with continuous economic growth is comparison of technical knowledge with the needs of the knowledge users and the cultural, social and physical conditions in its application (1). Many evidences, particularly in economically developing countries, have shown that a lack of proportion between technology and its users in an environment where technology is used causes negative outcomes such as low production quality and high rate of work-related injuries and accidents (1). According to the research literature, despite the development of mechanization and industrialization of works processes and use of machines rather than brawn and as a result of physical inactivity, various diseases and physical and emotional distresses are appeared in humans (2).

In industrially developing countries, workplace problems

and injuries are very serious and it is considered as one of the major problems in a number of active economic sectors in the these countries. Workplace injuries cause damage to body structures such as muscles, joints, tendons, ligaments, nerves, bones and blood circulation system (3). According to recent reports published by state statistic agencies in the United States of America, 40% of compensation is related to musculoskeletal disorders and it account for about 45 to 54 million dollars in a year (4).

Increased prevalence of musculoskeletal disorders in the workplace is directly related to the ergonomic work environment causes, so that factors such as repetitive movements, the adverse physical position and subtle repetitive tasks increase the disease more than other ergonomic factors (5).

People encounter a variety of appliances, equipment's and environments in their daily lives. Incompatibility and mismatch between the external environment and mental and physical features and capabilities cause symptoms which will result in enormous losses to different aspects of the life such as inappropriate safety and health, low productivity, low

productivity and ultimately low efficiency. Therefore, the human environment must be designed tailored to his physical and mental condition and physical capabilities so that no pressure is put on him and he is not hurt. The main problem to achieve a good design is that humans are different in various aspects and dimensions of life such as body size (physically) and also intelligence (mentally) (6).

Many of these problems in the workplace are solved by resorting to ergonomic methods. Ergonomics is used in order to have maximum use of technology for providing employees' welfare and efficiency and for the combined use of manufacturing and service facilities to achieve greater productivity, improved health status and workplace satisfaction. Ergonomics is the scientific study of humans in relation to their workplace environment. Ergonomics is a young science that has an important role in increasing productivity and enhancing the wellbeing of staff. Ergonomics studies the interaction between man and machine, the environment and tools and seeks to optimize their proportions (7). Ergonomics deals with the measurement and assessment of human capabilities and thus assists engineers and designers to build systems and processes more appropriate for all human characteristics (7). Ever increasing technologies and new sciences in human life caused rising the speed of works and productivity, but it has also imposed some of the side effects of inactivity, exhaustion, neuropsychiatric pressure and the increased incidence of musculoskeletal disorders to man. Many people spend a great deal of their daytime at workplace and do much of their works by the computer (8). In recent years, computer is essential in almost any work and few professions can be found in which computer is not used to perform the tasks (9).

Although initially this device as an efficient tool solved many of the problems of modern man, the damages that its users have already been facing have become a new problem (10). Radulovic et al., (2012) reported that use of ergonomic computer equipment has a significant impact on increasing efficiency and reducing musculoskeletal disorders (11). Eltayeb et al. (2009) showed that complaints due to musculoskeletal disorders in office computer users were very high and these complaints contain a mixture of physical and psychological problems (12). A review of scientific literature confirms the relationship between computer use and musculoskeletal disorders. Some researchers emphasize that the prevalence of musculoskeletal disorders among computer users compared with other workers are more and computer users are prone to the development of musculoskeletal symptoms with a prevalence of 50 percent (13). Bastani and Lahmi reported the overall incidence of musculoskeletal complications among the computer site employees at a governmental center 48,2% that the most complications were in neck (53%), back (48%) and shoulder (12%) (9).

Numerous studies have demonstrated the positive impact of education on increasing individuals' knowledge. For example, a study performed on 75 computer users showed that the intervention group (the trained group) gained higher scores on knowledge, attitude, perceived behavioral control, intention, as well as observing the natural posture as the target behavior compared with the group without intervention (14). Prevention and management of professional musculoskeletal disorders among computer users is a common issue in occupational health. Recommended interventions for the prevention and

management of these disorders include redesigning workstation and executive interventions like training (13). Nowadays, education is an inevitable necessity of human. Training and skill enhancement have become essential tools for dealing with the problems of the today's complex and evolving world (15). The acceleration of changes in the world today indicates the centrality of the role of human and human resources in opening bottlenecks and developing advanced technologies and producing different products.

Computer-assisted instruction is a method in which the computer will act as a support tool to help people learn (16). With the increasing growth of the Internet and the increasing number of Internet users, there is a need to investigate the impact of the Internet. Internet is a multimedia device that placed a world of information within itself (17).

Based on a qualitative study performed among undergraduate students by Gao. et al. in 2014, learning through the Internet should be used as an important supplement to formal education in the curriculum (18).

To understand the possibilities of training and consulting services online, first we must have a comprehensive understanding of the capabilities and limitations of the site. These characteristics may make it easier or more difficult to establish and sustain the relationship. For example, there are some obstacles such as assessing the validity of contents, discrimination or differences in access to information between those who have computers and those who are deprived of having it, lack of the skills needed to search the content, lack of time, busy lines and financial costs that make the Internet use difficult (19).

The health benefits of using computer presentations is include: they are not restricted to particular times and places, better retention of information, multimedia capabilities, greater accessibility, personal training, offering identical courses, compatibility of courses with the progress of the respondent, more active participation of the audience, more adaptability with the needs of people with less costs, the ability to store and retrieve large volumes of information that enhances the learner's motivation, as well as providing efficient and timely access to learning content for learners more than traditional education methods (20). Moreover, Korzeniowska (2014) investigated staffs in which it was found that the staffs believe that the internet plays a positive role in helping their health.(21) They are aware of its importance as a tool for supporting people with health problems and as an alternative source of information on healthcare issues (21). The advent of the internet and the increasing growth of the World Wide Web created a dramatic change in the information exploring process and has led a large number of users for the first time have ability to search and access large volumes of diverse data such as full-text scientific articles and reports, scientific training programs and conferences at their homes or works through PCs (22). Therefore, given the high frequency of occupational risk factors among computer users and a high prevalence of musculoskeletal disorders in this working group, in this study, we decided to prevent the occurrence of these problems through online training according to computer users' access to this technology.

## 2. METHODS

This study, was a quasi-experimental which was conducted

with the aims to “determine the impact of online training on posture reform of computer users who work in two Iranian universities including: Islamic Azad University and Sistan and Baluchestan University of Zahedan in 2014”. First, a letter of allowance was taken from the Health School of Sistan and Baluchistan and Islamic Azad University to provide a list of all computer users who work in the universities to have the two universities’ partnership to the end of the implementation and to offer training intervention to the experimental group users.

Prior to the execution of the study, the subjects of the study were informed of the objectives of the study, reasons for collecting the information, method of implementing the study and asking their permission in order to participate in the research study, respecting the privacy of their information and presenting the results of the study to the them and the cooperative organizations, and then a consent form to participate in the study was completed by the participants. Random sampling was used in a way that the researcher referred to the two universities and selected the computer users randomly; furthermore, to avoid bias (communication of training information) the intervention group and the control group were selected from Sistan and Baluchestan University and Islamic Azad University, respectively.

Homogeneity in both intervention and control groups were individually performed according to age, gender, education level and hours of working with computer during the day. Members in both intervention and control groups were studied in terms of the exclusion criteria and if they wished to participate in the study, pre-test questionnaire was completed by the interviewer. Due to the lack of standardized questionnaires in the field, a questionnaire was prepared using source and reference books and results of other studies in this area. To determine the clarity of the items, the questionnaire was given to 10 computer users and necessary changes were made for item clarity. To determine the validity, the questionnaire was given to two health education specialists and four occupational health specialists. After deleting and editing the questions which were not approved by the professors, content validity (CVR) and index validity (CVI) of the questionnaire were achieved 71% and 81%, respectively.

To determine the reliability and stability of the questionnaire, internal consistency and test-retest method were used, respectively. Thus, we gave the initial test to 10 computer users who did not enter our study and after 10 days the questionnaire was filled again and a comparison was made between the new responses and the previous ones using the Pearson correlation test then the questions with correlation coefficients less than 0.7 were excluded and the final questionnaire with the remaining items achieved Cronbach’s alpha mean of 87.81, 82.0, 0.0 and 0.83, and correlation coefficient of 0.78, 86.87, 0.0 and 0.84 scores on knowledge, attitudes, self-efficacy and performance questions.

**The final questionnaire consisted of five parts:** A) Demographic information of the computer users (9 items).

B) Knowledge questions consisted of 13 three-choice questions and four questions with answers of “Yes, No, and I do not know” and in all questions 2 scores was given to the correct option and zero score was given to the wrong choice and 1 score was given to the “I do not know” option.[If a person

chooses “I do not know” option, he has more readiness for training, but the person who chooses the wrong answer, he should be reformed first then he should learn the correct knowledge] (Range of scores 0-26).

C) Attitude questions included 8 items each having five choices (totally disagree, disagree, no opinion, agree, strongly agree) and were graded and calculated from 1 to 5 (Range of scores 8-40).

D) Self-efficacy questionnaire consisted of 11 items with five options (never, low, medium, high and very high) and were calculated and graded from 1 to 5 (Range of scores 11-55).

E) To assess the performance, a checklist provided with the consultation of occupational health specialists and reliable scientific books was used. This checklist was completed by the researcher at workplace of the user and the checklist contained 11 two-choice items of Yes and No in which Yes option had 1 score and No had zero score (Range of scores 0-11).

The educational content was provided by referring to the most recent scientific resources such as articles, books, and websites. PowerPoint training content included: (definition of musculoskeletal diseases and their significance, physical risk factors leading to musculoskeletal disorders, definition of ergonomics and benefits of observing the ergonomic factors in workplace, features of an ergonomic and appropriate working environment, type of computer use related diseases and prevention of these complications, how to properly pitch the desk and devices on it, good lighting of the environment, features of ergonomic chair and desk, the proper use of all equipments related to the computer and desk, such as keyboard, mouse, ergonomic pad, footrest of the chair and finally some useful exercises to remove fatigue caused by working with computer. Then the educational content was given to 2 of the health education professors and 2 of the occupational health professors and their reform opinions were used.

After collecting the pre-test questionnaires, the resulted data was analyzed using SPSS 19 software and according to the information obtained from the questionnaires, the educational content was developed then the educational intervention was performed just in intervention group by training through official automation connected to the Internet.

Educational materials of every session were sent to the computer users in the intervention group in PowerPoint format through the official automation connected to the Internet. After the training sessions of each week, the same training PowerPoint was sent to the uses to recall the materials. Then, 45 days after the end of the training program, the post-test questionnaire was distributed in the intervention and control groups and after collecting the questionnaires and analyzing the data using SPSS 19 software, the impact of education on preventive behaviors of muscular pains in computer users in both intervention and control groups was studied. Statistical tests of Kolmogorov, t-test, Fisher Exact test, and correlation coefficient were used for data analysis. To describe the quantitative data of measured of central tendency and qualitative data to described the frequency (absolute and relative) were used

### 3. RESULTS

Number of female participants in the intervention group

and the control group was 50 and 53, respectively and the number of male users in the intervention group and the control group was 30 and 27, respectively. The number of people with diploma or less education in the intervention and the control groups was 9 and 3 and the number of people who had a university education in the intervention and the control groups was 71 and 77 people, respectively. There was no significant relationship between gender in the groups under the study using Fisher's correction test, and no significant relationship was found at the level of education ( $P < 0.05$ ).

The average age of users in the intervention group were 36.4 and in the control group 38.3 years old and the average hours of work with computers during the day in the intervention group were 6.7 hours and in the control group were 6.01 hours. The means of age and hours of work during the day in both groups of intervention and control were studied that based on the *t*-test, no significant relationship was found between the ages of the two groups ( $P > 0.05$ ). However, based on the independent *t*-test there was a significant relationship between work hours of computer work per day in the two groups ( $P < 0.05$ ).

According to Table-1, it is shown that the mean difference of knowledge scores change between the intervention and control groups is significant ( $P < 0.001$ ) and this change in the intervention group (5.45) is more in control group (1.20) and it is positive which implies that the training has increased the knowledge of the intervention group.

The mean difference in attitude scores change between the intervention and control groups is significant ( $P < 0.001$ ) and this change in the intervention group (3.60) is more in control group (0.48) and it is positive which indicates that the training has increased attitude of the intervention group (Table 2).

The mean difference in self-efficiency scores change between the intervention and control groups is significant as well ( $P < 0.001$ ). This change in the intervention group (14.83) is more in control group (0.88) and it is positive which shows that the training has increased attitude of the intervention group (Table 3).

Also, the mean difference in performance scores change between the intervention and control groups is significant ( $P < 0.001$ ) and this change in the intervention group (5.28) is more in control group (0.62) and it is positive which indicates that the training has increased performance of the intervention group (Table 4).

As shown in Table 5 about the correlation of the variables in this study, there was also a significant relationship between the scores of self-efficacy and performance after training ( $P < 0.001$ ).

#### 4. DISCUSSION

In this study, some factors were as project limitations that these were included: *i*) Due to busy work, some of the staff

Time Group	Before intervention	After intervention	Changes	P for Paired t-test
	Mean and standard deviation	Mean and standard deviation	Mean and standard deviation	
Intervention	18.76±3.42	24.21±1.34	5.45±2.81	$P < 0.001$
Control	20.65±2.49	21.85±2.22	1.20±1.07	$P < 0.001$
Maximum score	26			
P for independent t-test	$P < 0.001$	$P < 0.001$	$P < 0.001$	

Table 1. Comparison of the mean and standard deviation of computer users' knowledge score changes before and after the training in the intervention and control groups.

Time Group	Before intervention	After intervention	Changes	P for Paired t-test
	Mean and standard deviation	Mean and standard deviation	Mean and standard deviation	
Intervention	34.76±3.45	38.36±2.89	3.60±3.59	$P < 0.001$
Control	36±3.49	36.48±3.53	0.48±1.03	$P < 0.001$
Maximum score	40			
P for independent t-test	$P = 0.026$	$P < 0.001$	$P < 0.001$	

Table 2. Comparison of the mean and standard deviation of computer users' Attitude score changes before and after the training in the intervention and control groups.

Time Group	Before intervention	After intervention	Changes	P for Paired t-test
	Mean and standard deviation	Mean and standard deviation	Mean and standard deviation	
Intervention	30.22±7.13	45.06±4.11	14.83±4.67	$P < 0.001$
Control	31.93±7.42	32.82±7.30	0.88±1.93	$P < 0.001$
Maximum score	55			
P for independent t-test	$P = 0.139$	$P < 0.001$	$P < 0.001$	

Table 3. Comparison of the mean and standard deviation of computer users' self-efficacy score changes before and after the training in the intervention and control groups.

Time Group	Before intervention	After intervention	Changes	P for Paired t-test
	Mean and standard deviation	Mean and standard deviation	Mean and standard deviation	
Intervention	2.66±1.25	7.95±1.16	5.28±1.24	$P < 0.001$
Control	2.83±1.10	3.46±1	0.62±0.73	$P < 0.001$
Maximum score	11			
P for independent t-test	$p = 0.351$	$P < 0.001$	$P < 0.001$	

Table 4. Comparison of the mean and standard deviation of computer users' performance score changes before and after the training in the intervention and control groups.

Variable	Correlation test	Knowledge	Attitude	Self-efficacy	Performance
Knowledge	Pearson correlation coefficient	1			
	P-value				
Attitude	Pearson	0.12	1		
	P-value	0.276			
Self-efficacy	Pearson	0.07	0.19	1	
	P-value	0.53	0.09		
Performance	Pearson	0.06	-0.04	0.23	1
	p-value	0.63	0.75	0.041	

Table 5. Correlation test between scores changes on self-efficacy, knowledge, attitude and performance (behavior) of computer users.

did not have enough time to study the sent materials. To solve this problem, once a week the materials were sent to the employees through official automation; *ii*) In the second phase of the questionnaire distribution, some of the employees were on leave and by asking about them from the responsible person of

their units, the questionnaires were distributed among them after they returned.

ICT-based learning, due to the communication with the other group members, results in motivation and satisfaction among students. Synchronous communication techniques with immediate feedback, encourages learning from afar. This learning relies on the energy of the group and helps the learners to maintain their relationships with their peers and continue their studies (23).

The our study showed that the mean difference in scores change between the intervention and control groups was significant ( $P<0.001$ ). This change in the intervention group (5.45) was more than the control group (1.20) which is positive and implies that education has increased knowledge in the intervention group. In this study, users' knowledge score in the intervention group after the intervention raised from  $3.42\pm 18.76$  to  $1.34\pm 24.21$ . Isa Mohammad Zeidi et al., illustrated knowledge score of the population increased after the training intervention was between  $2.91\pm 7.97$  to  $1.98\pm 14.07$  that the mean increase was consistent with our study (24).

Armstrong et al. in 2013 reported that use of information technology is very effective to improve and expedite the training of learners which is consistent with the findings of our study (25).

In this study, a significant increase was observed in attitude score of the intervention group from  $34.76 \pm 3.45$  to  $38.36 \pm 2.89$ . Also, in the study done by Isa Mohammad Zeidi and Banafsheh Mohammadi Zeidi, there was a significant increase in score of attitude after the intervention from  $17.92 \pm 6.54$  to  $21.61 \pm 4.73$  ( $P<0.05$ ) which was consistent with our study (26).

According to a study performed by Kai Sassenberg et al., communication via the Internet associated with positive changes in the attitudes of the study population (27). Self-efficacy explains how an individual perceives the ability to change behavior, arousal level, thought patterns and emotional reactions (28).

In our study, self-efficacy scores increased after training computer users from  $30.22 \pm 7.13$  to  $45.06 \pm 4.11$ . Consistent with our results, increase in self-efficacy score was observed after the intervention in the study population of Sanaee Nasab (29). In 2011, a study was conducted by Mansour Kiaee et al. in which the results showed that educational intervention caused behavior change in the intervention group that was consistent with our study (30).

Tabae Emami et al. (2011) illustrated that the educational intervention increased the performance of the experimental group (31) which is consistent with our study because educational intervention increased the performance of the experimental group in our study as well. Moreover, the performance score of computer users in the intervention group increased from  $2.66 \pm 1.25$  to  $7.95 \pm 1.16$ .

In our study, scores of knowledge, attitude, self-efficacy and performance of users in intervention group were significantly higher compared to the time before the intervention and it was also higher than the control group which reflects the tremendous impact of the Internet training presented to the intervention group. The difference in mean changes in the intervention group is more than the control group that is due to the impact of the designed training PowerPoint.

In a study conducted by Chen et al., online education led to positive changes in performance, attitude, and self-efficacy in the population under the study (32). High sense of self-efficacy results in effort, resistance and flexibility. However, people with high self-efficacy believe they are able to effectively influence events in their lives and they expect more success than those who have low self-efficacy (33).

In our study, about the correlation between variables of the study, the Pearson correlation test showed that there was a significant relationship between the scores of self-efficacy and performance after training ( $P<0.001$ ). Self-efficacy refers to the confidence one has in his own ability to accomplish and maintain a behavior and plays a pivotal role in changing behavior.

Roosbehani et al. 2012, reported a significant relationship was found between self-efficacy and behavior change of individuals (34).

## 5. CONCLUSIONS

Based on the findings of the study, the following results are obtained and the researcher's recommendations are offered associated with these conclusions.

Since postures of computer users are greatly important in afflicting them to musculoskeletal disorders and intervention efforts to promote appropriate physical postures while working with PC among users, the results of this study showed that online training of the computer users increased their knowledge, attitude, self-efficacy, and performance which indicate the positive impact of the Internet learning. In addition, the results showed that by increasing the self-efficacy of the users, their performance improves and regarding that self-efficacy is the most important structure to predict the behavior, educational programs should be planned and implemented to promote self efficacy of the computer users and reform their body postures while working with computer. Hence, based on the findings of the study, internet education can be influential in increasing self efficacy and finally reforming the computer users' posture. So, generally the use of the Internet is recommended to educate computer users.

The results of our study determine the importance of more proper and newer educational methods using the Internet. Therefore, it is suggested that educational materials are available online at intermittent periods for users so that they are able to have access to educational contents easily without spending time and money.

Furthermore, it is recommended to train the computer users on the importance of correct body posture while working with a PC and to offer proper ergonomic tools in their workplaces.

According to the results of this study and the necessity of the use of appropriate strategies to increase self-efficacy, it is recommended to use self-efficacy structure studies in enhancing interventions of the computer users' performance in next studies.

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**CONFLICT OF INTEREST: NONE DECLARED.****REFERENCES**

1. Mir-Hosseini Z, Gholizadeh N. Investigating the physical injuries of workplace among librarians of governmental universities of Isfahan based on Ergonomic principles. *Epistemology*. 2010; 3(11): 118-133.
2. Taheri H, Mahdaveinejad R, Bagherian Dehkordi S, Omidali Z. The Amydly. Comparison of forward head in persons with chronic neck pain and healthy persons. *Journal of Research in Rehabilitation Sciences*. 2011; 7(2): 162-168.
3. Babai M, Rahnama N, Nadi MA, Sajadian P. The effect of exercise therapy and ergonomic based on virtual space in computer users with low back pain. *Journal of Research in Rehabilitation Sciences*. 2013; 9(1): 104-112.
4. Denis D SVM, Imbeau D, Jette C, Nastasia I. Intervention practices in musculoskeletal disorder prevention: a critical literature review. *Appl Ergon*. 2008; 39(1): 1-14.
5. Tahereh Yektaee FTG, Leila Piri. The Effect of Ergonomic Principles Education on Musculoskeletal Disorders among Computer Users Rehabilitation. 2013; 4: 108-116. [Persian]
6. Motamedzadeh M, Beigi M, Chubineh AR, Mahjoub H. Design and development of an ergonomic chair for Iranian office workers. *Journal of Zanjan University of Medical Sciences and Health Services*. 2009; 17(68): 45-52.
7. Mosadeghrad AM. Relationship between nurses' knowledge about agronomy and their job injuries. *Journal of Shahrekord University of Medical Sciences*. 2004; 6(3): 21-32.
8. Mirmohammadi SJMA, Soleimani H, Lotfi MH, Akbari H, Heidari N. Musculoskeletal disorders among video display terminal (VDT) workers comparing with other office workers. *Iran Occupational Health Journal*. 2010; 7(2): 4-11. [Persian]
9. Choobineh ANE, Arjmandzadeh A, Mohamadbaigi A. Musculoskeletal Disorders among Bank Computer Operators. *Iran Occupational Health Journal*. 2006; 3(2): 1-3. [Persian]
10. Taheri H, Mahdaveinejad R, Minasian V, Minasian V, Karimi A. The effects of an eight-week selected therapeutic exercises course and self-treatment by pamphlet programs on the rate of chronic neck pain and disability among computer users. *Journal of Isfahan Medical School*. 2012; 29(169): 1-11.
11. Radulović BHRA. Frequency of musculoskeletal and eye symptoms among computer users at work. *Arh Hig Rada Toksikol*. 2012; 63(2): 215-218.
12. Eltayeb SSJ, Hassan A, de Bie RA. Work related risk factors for neck, shoulder and arms complaints: a cohort study among Dutch computer office workers. *J Occup Rehabil*. 2009; 19(4): 315-322.
13. Mohammadi Zeidi HMB, Mohammadi Zeidi. Effectiveness of a Theory-Based Educational Intervention on Modifying Body Posture of Computer Users in Iran *Jornal of Rafsanjan University of Medical Sciences*. 2012; 11(2): 145-158. [Persian]
14. Sadeghi N, Moghaddam MA, Rahdar HHT. Effect of ergonomic training on saffron picker's postures. *Occupational Medicine Quarterly Journal*. 2012; 4 (4): 1-7.
15. Noroozi M, Zandi F, Musa Madani F. Ranking the methods of applying information technology in schools' teaching-learning process. *Quarterly Journal of Educational Innovations*. 2008; 7(1): 9-34.
16. Mohammady M, Memari A, Shaban M, Mehran A, Yavari P, Salari Far M. Comparing computer-assisted vs. face to face education on dietary adherence among patients with myocardial infarction. *Hayat*. 2010; 16(3-4): 77-85.
17. Ezazi HZ, Mohammad Javadi A. The impact of the Internet on family values among high school students in district 3 of Mashhad. *Journal of Iran Sociology*. 2005; 6(2): 121-146.
18. Gao X1, WL, Chow DY, Law XJ, Ching LY. Learning clinical procedures through Internet visual resources: A qualitative study amongst undergraduate students. *Eur J Dent Educ*. 2014.
19. Maleki Z, Gudarzi M, Mohtashami L, Faqih B. Knowledge and attitudes of dental students and academic staffs towards internet usage in dental training in Shahid Beheshti university of medical sciences in 2005- 2006. *Journal of Dental School, Shahid Beheshti University of Medical Sciences*. 2010; 28 (1): 40-46.
20. Vejdani MA, Alhani F, Kermanshahi S. Impact of a computer based instruction package on the quality of life of adolescents with epilepsy. *Journal of North Khorasan University of Medical Sciences*. 2011; 3(4): 88-89.
21. Korzeniowska EPK. Polish employees on the internet as a source of information about health and disease. *Med Pr*. 2014; 65(1): 1-13.
22. Habibi Sh, Farzi J, Lotfollahzadeh R. GPs' Information Seeking Behavior in Ardabil and Their Approach towards Electronic Sources. *Journal of Ardabil University of Medical Sciences*. 2008; 8(2): 136-141.
23. Farajollahi M. ZSeN. Information and communication technology based education in higher education. *Educational Strategies Journal*. 2010; 2(4): 167-171. [Persian]
24. Zeidi AM, Heidarnia A, Niknami ShA, Variani AS, Varmazyar S. The impact of the intervention on awareness, attitudes and ergonomic behaviors enhancement of employees. *The Journal of Qazvin University of Medical Sciences*. 2010; 14(1): 33-40.
25. Armstrong AD, Jarvis-Selinger S. I feel disconnected: learning technologies in resident education. *Instr Course Lect*. 2013; 62: 577-585.
26. Zeidi AM, Zeidi BM. The Effect of Stage - Matched Educational Intervention on Reduction in Musculoskeletal Disorders among Computer Users. *Journal of Babol University of Medical Sciences*. 2011; 14(1): 42-49.
27. Kai Sassenberg MB. Attitude Change in Computer-Mediated Communication: Effects of Anonymity and Category Norms. *Group Processes Intergroup Relations*. 2003; 6(4): 405-422.
28. Bandura A. Self-Efficacy. *H Friedman*. 1998; 4: 71-81.
29. Nasab H, Tavakoli R, Farrokhian A, Zarchi AA, Amini Z. The effect of educational intervention with the health belief model on knowledge, perceptions and self-efficacy among adolescent of high school girls about osteoporosis in 2010. *Urmia Medical Journal*. 2013; 24(3): 163-169.
30. Kiaei A, Abadi AM, Mirhoseini SS. The effectiveness of annual education programs on child road safety. *Sharif Journal Civil Engineering*. 2012; 2(3): 93-97.
31. Emami ShT, Nouri A, Poor M, Abedi A. Effectiveness of Cognitive-Behavior Training for Mothers on Changing Maternal Behavior and Child's Insecure Attachment. *Clinical Psychology*. 2011; 3(3): 7-16.
32. Chen HH1 YM. Developing and evaluating a smoking cessation program combined with an Internet-assisted instruction program for adolescents with smoking. *Patient Educ Couns*. 2006; 61(3): 8-411.
33. Salehi M, Kazemi SS, Haqqani H. Relationship between general health and self-efficacy in women referred to health center No.2 in Chaloos (2012) *Razi Journal of Medical Sciences*. 2013; 20(110): 63-70.
34. Roozbehan N, Poor Fagh, Ardebili HA, Zadeh AH. The relationship between self-efficacy, stages of change and physical activity behavior in women after childbirth. *Scientific Research Journal of Arak University of Medical Sciences*. 2012; 15(9): 61-71.