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Research article

A study to assess the effect of self instructional module on knowledge regarding prevention of occupational health hazards among computer operators working in Dr. D. Y. Patil institute of Pune city

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Abstract

The long time use of computers and stay in static position may results in computer related serious harms like back pain, neck pain, repeated strain injuries, computer vision syndrome. The aim of study: 1) To assess the existing knowledge on occupational health hazard among computer operators 2) To evaluate the effect of self-instructional module on knowledge of occupational health hazards among computer operators 3) To correlate the knowledge on occupation health hazards with selected demographic variables among computer operators. A total of 50 computer operators working in Dr. D.Y. Patil associated colleges in Pune, Maharashtra, India were participated in the study. The data were collected through structured knowledge questionnaire which includes the 7 items on demographic variables, 20 items to assess the knowledge regarding prevention of occupational health hazard and self instructional module was introduced to impart the knowledge.Most of the subjects were young (60%) with near 52% females. Half of the subjects had graduate level of education and 44% had less than 5 years of experience. 60% of the subjects had 4-6 hour of daily exposure to computers. The present study shows that the mean pretest and posttest knowledge score was 9.04 and 18.24 respectively. The difference between mean scores is 9.2 and the calculated "t" value is 3.23, which was highly significant at the level of $P<0.05$. This indicates that self instructional module was found to be effective in increasing the knowledge of the computer operators regarding prevention of occupational health hazards.

Keywords: Occupational health hazard, knowledge, Self Instructional module, computers, nursing, Pune.

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1. Introduction

In the competitive world every individual has to work very hard to grow oneself to meet requirements. Computers are indispensable to human life which is required to meet both personal and professional needs [7]. Computers influence every sphere of human activity and bring changes in education, industries, and health care. The presence of computer in the workplace leads to a set of peculiar characteristics of the workstation which require the workers to stay in a static posture for long periods [2, 7]. This has led to an increase in computer related injuries like back pain, neck pain, repeated strain injuries, computer vision syndrome**.** Occasional computer users may notice no ill effects; however those who spending several hours a day for many years especially computer professionals should pay careful attention to ergonomics. [7] Ocular discomfort, musculoskeletal disorders and psychosocial problems form the key category of the health problem found among constant computer users [4]. Prolonged use of computers and keyboard can cause orthopedic injuries from repetitive strain. [9]

Repetitive strain injury (RSI) is a cumulative traumatic disorder resulting from prolonged, forceful or awkward movements. Persons affected by RSI include musicians, and those with frequent use of computer mouse and keyboard [9]. Posture stress due to poor workstation ergonomics such as inappropriate location of the monitor, keyboard or mouse has been found to be associated with musculoskeletal problems. [1]

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Since the incidence of computer related health problems among computer operators is very high, there is an urgent need to spread awareness regarding these conditions with various education programs like informational booklets, posters, charts and pamphlets etc. Keeping it in mind, researcher aimed to assess the effect of a self-instructional module on prevention of occupational health hazards among computer operators.

Need for study

Millions of people around the world now use computers as their primary business tool. In the last decade or so, the number of hours people use computers has increased tremendously. With this increase in the use of computers, problems have also increased. Some of the most common problems related to computer use are Carpal tunnel syndrome, repetitive strain injury, computer eyestrain, computer vision syndrome**.** These conditions are far easier to prevent than to cure once contracted, by having a healthy lifestyle and work habits and working at ergonomically good workstation.

A cross sectional study was conducted in Rural Medical College, Pravara Institute of Medical Sciences, Loni, Maharashtra among 150 computer operators to assess the magnitude of computer related health problems among computer using staff. In the present study, 93.3% (140) of the study subjects reported one or more computer related health problem [4].

Study was conducted to assess the prevalence of musculoskeletal and visual disorders among the 100 Visual Display Terminals (VDT) workers were conducted in West Bengal. The study suggest that VDT workers suffered discomfort (pain) in the lower back and the upper extremities (especially at neck, shoulder, elbow, wrist and arm) of the body due to working in a prolonged period of time in a improper work station [3].

Statement of problem

'A study to assess the effect of self instructional module on knowledge regarding prevention of occupational health hazards among computer operators working in Dr. D. Y. Patil institute of Pune city'

Objectives

[1] To assess the existing knowledge on occupational health hazard among computer operators.
[2] To evaluate the effect of self-instructional module on knowledge of occupational health hazards among computer operators.
[3] To correlate the knowledge on occupation health hazards with selected demographic variables among computer operators; working in Dr. D.Y. Patil Institute of Pune City.

Variables

[1] Dependent variable: - Level of knowledge score of computer operators on Occupational Health Hazards.
[2] Independent variable: - Self Instructional Module on Prevention of Occupational Health Hazards among computer operators.

Assumptions

[1] Computer operators are at high risk for developing computer visual discomfort, fatigue, stress, musculoskeletal diseases.
[2] Computer operators may not have adequate knowledge on occupational health hazards.
[3] Self Instructional Module may enhance the knowledge on prevention of occupational health hazards of computer operators.

Research hypothesis

H_0: There will be no significant difference in knowledge of the computer operators after receiving self instructional module.

Conceptual framework

The framework of the present study is based on the Imogene King's goal attainment Theory, a human interaction process model for assess the effectiveness of the self instructional module on knowledge among computer operators. The interaction process model describes the nature of and standard for nurse-patient interaction that lead to goal attainment- that nurse purposefully interact and mutually set, explore and agree to means to achieve goals.

2. Methods and materials

Research design

Pre-Experimental one group pre test post test study design.

Research approach

Evaluative approach was used to evaluate the effectiveness of self instructional module on computer operators.

Sample and sample size

The sample selected for the present study comprised of 50 computer operators (now onwards referred as subjects) working in Dr. D.Y. Patil college of Nursing, Dr. D.Y. Patil college of Physiotherapy, Dr. D.Y.Patil Medical college and Hospital of Pune city.

Sampling technique

Non probability, purposive sampling technique was used for selecting subjects from 29-Nov-2011 to 12-Dec-2011.

Inclusion criteria

1. Computer operators who are working in Dr. D. Y. Patil institute of Pune city 2. Computer operators who are working on computers daily for more than 3 hours. 3. Computer operators who are willing to participate in the study.

Exclusion criteria

Computer operators who have undergone safety training program on prevention of occupational health hazards.

Ethical consideration

The present study was approved by the Institutional Ethics Committee (IEC) and Institutional Research Committee (IRC) of Dr. D.Y. Patil Vidyapeeth, Pune and Informed consent was obtained from the subjects who participated in the study.

Method of data collection: A structured knowledge questionnaire was prepared for data collection from the subjects based on the study objectives.

Development and description tool

After an extensive review of literature and discussion with experts the structured knowledge questionnaire and self instructional module on prevention of occupational health hazards are developed. The tool consists of two sections.

Section- I

It comprises of 7 items seeking information on demographic data of the computer operators such as age, sex, professional qualification, years of experience, income, hours of daily exposure to computers and information regarding training programme related to prevention of occupational hazards.

Section- II

It consists of structured knowledge questionnaire on prevention of occupational health hazards among computer operators. This section consists of 5 sub categories and each consists of 4 items.

The followings are the 5 sub categories of structured knowledge questionnaire.

1. Definition , cause and prevention of computer related health problems
2. Chair arrangement
3. Workstation
4. Office lighting
5. Workspace exercises

Scoring technique

All questions in section II were multiple choice questions with single correct answer. Every correct answer awarded a score of 1 mark and every incorrect answer awarded as 0 marks. The maximum score on knowledge questionnaire was 20.

Development of self instruction module

It was developed based on review of related literature and objective stated for knowledge test. The title of the module was self instructional module on prevention of occupational health hazards among computer operators.

The content of the self instructional module consist of introduction about occupational health hazards, and 4 sub categories under the heading of chair arrangement, work station, office lighting and workspace exercises, which gives preventive measure of computer related health problems. It also includes references. The self instructional module was tested during the pilot study and was found reliable.

Validity and reliability of tool

To ensure the content validity of the tool it was submitted with structured knowledge questionnaire and self instructional module to 24 experts along with blue print. The experts were from medical surgical nursing, community health nursing, preventive social medicine departments, forensic medicine department, physiology department, physiotherapy department, occupation health department and data informatics and research department. They were requested to give their opinion on the appropriateness and relevance of items in the tool. Certain items were modified as per their suggestions such as eye exercises and stretch exercises at workplace.

After the validation of the tool, the final tool was made and its reliability was checked. Tool was administered to 10 samples selected as per the criteria. The time taken per respondent was 15 to 20 minutes. Reliability was assessed using test-retest method. Pearson's correlation coefficient was found to be 0.93.

Procedure for data collection

A formal permission was obtained from authorities of the selected colleges of Dr. D.Y. Patil institute of Pune city. Actual data collection is done on 50 computer operators who meeting the criteria for the study. The study was carried out from 29th November to 12th December of 2011. On day one, purpose of the study was explained to each computer operator and confidentiality of her/his response was assured. After pre-test the same day self instructional module was administered to the subjects. Post-test was conducted on 7thday.

Statistical analysis

Descriptive and inferential statistics was planned for data analysis. The collected data was organized, tabulated and analyzed by using descriptive statistics.

3. Results

The results shows that 30(60%) of the samples were from age group 21-30 years, 16(32%) of them were from age group 31-40 years and remaining 4(8%) of them were from age group 41-50 years. 26(52%) of them were females, 5(10%) of them were 12th pass, 25(50%) of them were graduates and 20(40%) of them were post graduates. 22(44%) of them had less than 5 years of experience, 19(38%) of them had 5-10 years of experience, 6(12%) of them had 10-15 years of experience and remaining 3(6%) of them had more than 15 years of experience. 9(18%) of them had less than Rs. 5000 income, 20(40%) of them had income Rs. 5000-10000, 9(18%) of them had income Rs.10000-15000 and 12(24%) of them had income Rs. 15000-20000.

30(60%) of them had 4-6 hours of daily exposure to computers, 17(34%) of them had 6-8 hours of daily exposure to computers and 3(6%) of them had more than 8 hours of daily exposure to computers. None of them had undergone any training program related to prevention of occupation hazards. Analysis of data related to knowledge of computer operators and effect of self instructional module regarding prevention of occupational health hazards.

Table 1: Mean, mean difference, SD and "t" value of pretest and posttest knowledge scores of computer operators

Knowledge	Mean	Mean difference	SD	"t" Value
Pretest	9.04	9.2	8.96	3.23
Posttest	18.24		18.05	

P<0.05= 2.009

The above table no.1 shows the mean score of pretest and posttest. The difference between

mean scores is 9.2 and the calculated "t" value is 3.23, which was highly significant at the level of P<0.05. This indicates that self instructional module was found to be effective among computer operators.

Analysis of data to find association between knowledge and selected demographic variables of computer operators.

Table 2: The association between knowledge score and selected demographic variables

SN	Demographic variable	Chi square	Significance
1.	Age	0.267	Not significant
3.	Professional Qualification	23.32	Highly significant
4.	Year of Experience	3.68	Not significant
6.	Hours of daily exposure to computer	0.618	Not significant

df= 1; P<0.05=3.841

The table no 2 shows that chi square value for professional qualification was 23.32 and was found highly significant at P<0.05 level Were as the chi-square value was not found to be significant with other demographic variables such as Age (0.267), Years of experience (3.68) and Hours of daily exposure to computer (0.618).

4. Discussion

Most of the samples were from age group 21-30 years 30(60%), 4(8%) of them were from age group 41-50 years. 26(52%) of them were females. 25(50%) of them were graduates and 20(40%) of them were post graduates. 22(44%) of them had less than 5 years of experience, 19(38%) of them had 5-10 years of experience. 0(60%) of them had 4-6 hours of daily exposure to computers, 17(34%). The present study it was found that the mean knowledge score of pretest was 9.04 and mean knowledge score of posttest was 18.24, the mean difference between the post-test and pre-test knowledge score was 9.2 and the calculated "t" value is 3.23, which was highly significant at the level of P<0.05. This indicates that self instructional module was found to be effective among computer operators.

In present study Demographic variables like age, year of experience and hours of daily exposure to computers, were found to have no significant association with knowledge score, whereas professional qualification is the only demographic variable which was found to have highly significant association with knowledge score.

The present study it was found that the mean knowledge score of pretest was 9.04 and mean knowledge score of posttest was 18.24, were as in one of the study 34 % of them were have knowledge of health safety policies about computer use [12].

It was found that the mean difference between the post-test and pre-test was 9.2 was significant ("t" value was 3.23; p<0.05). It can be concluded that, the self instructional module in computer operators is proved to be effective in delivering the knowledge and awareness. In one of the study the fitness program mean difference between post test and pre-test 0.2 and was found to statistically significant.

Conclusion

Self instructional module was effective in increasing the knowledge of the computer operators regarding prevention of occupational health hazards. There was no association of demographic variables like age, gender, year of experience, income and hours of daily exposure to computers except professional qualification.

Implications of the study

Nursing practice

Nurses are key persons of a health team, who play a major role in the health promotion and maintenance. So the researchers generally integrate findings into practice. Advance nursing practice is one of the evolving trends in nursing practice in which definite specified roles of nurse clinician, nurse practitioner are emerging. Studies on computer professionals contribute to development of a new specialization itself in nursing of that of nurse ergonomist- a specialist role of nurse who manages the ergonomics case management in all work settings. Nurse as a

primary care giver have the supreme responsibility in prevention of work related health problems among computer operators.

Nursing education

Nurse educators can educate related to health problems like musculoskeletal disorders, computer vision syndrome in nursing. Specialization courses in office ergonomics to be given. In collaboration with the regulation bodies, education institutions can arrange and conduct workshops and seminars on prevention of occupational health hazards among computer operators. In depth knowledge regarding ergonomics can be provided in community health nursing Courses.

Nursing administration

An administrator can play better role in educating the professional. The study assists the nursing administrative authorities to initiate and carry out health education program in various institutions, IT industries, and other computer using sectors for the benefit of the community and employees. It can also provide administrative support for development of educational materials like information booklet, educational program and posters, charts, CDs, pamphlets on prevention of computer related health problems. Administrative support and directions need to be given to the organization and employees to implement preventive measure regarding management of occupational health hazards.

Nursing research

Work-related musculoskeletal disorders are common in computer operators. Therefore it is necessary to conduct extensive research in this field, using variety of settings and population. It will be helpful in reducing absenteeism and may improve work productivity of the institution organization or IT companies. There is an increased need of studies regarding prevention of occupational health hazards among computer operators at graduates' and Post graduates' level in various settings in India. Efforts can be made by nurse researcher to conduct interactive session computer operators for maintenance of healthy working practices and also to disseminate the finding of research on the health problems related to prolonged computer use. Nurses can give their valuable contribution of this knowledge to make the computer professionals positive health towards their profession.

Recommendation

- A similar study may be replicated on large samples; thereby findings can be generalized for a large population.
- A similar study can be carried out to assess the prevalence of health problems among computer operators.
- A longitudinal study can be conducted to assess the long term exposure to computers.
- An Experimental Study may be conducted using workstation modification workspace exercise.
- A Similar kind of study can be undertaken in different settings and different target population, such as IT professionals and call centre employees.

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