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# A COMPARATIVE STUDY OF COMPUTER- RELATED HEALTH PROBLEMS AND STRESS AMONG GOVERNMENT AND CO-OPERATIVE SECTOR BANK EMPLOYEES IN THE VICINITY OF A TERTIARY CARE HOSPITAL

**Occupational Health**

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## ABSTRACT

**Background:** Due to upsurge in information technology, daily increase in number of computer usage in banking sector and increasing use of online banking services in India, there is need for research into computer related health problems. **Objective:** to compare and estimate prevalence of computer related health problems and stress among Government and Co-operative sector Bank employees and to study its association with their working environmental conditions. **Methods:** Comparative study was conducted with pre-tested, pre-designed questionnaire in 12 Govt. (144 employees) and 5 Co-op. banks (77 employees) aged 25-50 years by Census Enumeration Method for 18 months. Inclusion criteria: employees working in current job since the past 2 years and on computer for at least 5 days/week and minimum 4 hours/day. Questionnaire included socio-demographic details, working environment and problems experienced while working on computers. Modified standardized Nordic questionnaire (musculoskeletal), depression anxiety stress scales (DASS) (stress), Snellen`s-Jaeger's chart (visual acuity) and digital lux meter (illumination) was used. Statistical analysis done using SPSS 25. **Results:** Most common morbidity in Government bank employees due to computer use was Musculoskeletal symptoms 106(73.61%) while in Co-operative bank employees it was keyboard related symptoms 47 (61.03%). %). It was found 60/144 (41.66%) Government employees and 22 /77 (28.57%) co-operative bank employees experienced Stress at workplace. Stress had significant co-relation with computer usage at workplace in both Govt. and Co-operative banks. **Conclusions:** Computer-related morbidities and stress was common in both, Government and Co-operative bank employees. Banks from both the sectors should adopt ergonomic workplace design for better health, well-being and productivity of bank Employees.

## KEYWORDS

Musculoskeletal disorders, Carpal tunnel syndrome, Ergonomics

## INTRODUCTION

The proliferation of video display terminals (VDT) in the modern office setting of banks has generated concern related to potential health hazards associated with their use.[1] Musculoskeletal pain and visual discomfort are the main health problems reported by computers and the major contributors to workdays lost.[2-4] Prevalence of musculoskeletal disorders among keyboard users has been reported to be as high as 81%. In the computing environment, incorrect computer workstation set up, prolonged work in fixed or awkward positions, seated and static work, and overuse have been identified as MSD risk factors.[6-10] Psychosocial and organizational factors were related to the experiences of psychological stress, musculoskeletal disorders and problems with vision among computer users.[11] A large percentage of data processing workers reported chronic physical complaints (i.e. eyestrain, musculoskeletal pains, and headaches) and emotional stress that they believed were work related.[12] Surveys of computer workers reveal that vision related problems are the most frequently reported health problems, occurring in over 70% of computer workers.[13] "Computer vision syndrome" is related to the unique aspects of tasks. Aspects of the design of the computer video display terminal such as screen resolution and contrast, image refresh rates and flickers and screen glare as well as working distances and angles all may contribute to worker symptoms.[14,15] Thus, this study is being carried out with the following objectives: to study the socio-economic and demographic profile of the bank employees, to identify the ergonomic factors related to the working conditions of the employees and to determine their quality at workplace, to estimate the prevalence rate of computer related health problems and stress among bank employees and to study their association with the working environmental conditions, and to assess the stress levels associated with computer use among bank employees.

## METHODS

A cross sectional comparative study was conducted in total 17 banks (12 Government and 5 Co-operative sector banks) among 221 bank employees (144 Government and 77 Co-operative sector employees) aged 25 to 50 years in the vicinity of a tertiary care hospital of Mumbai, Maharashtra in India for 18 months. It included males and females who are mainly desk job workers, subject working in the current job since past 2 years, subject working on computers for at least 5 days/week and minimum 4 hours/day and excluded any type of postural deformities, any history of recent injury/trauma or accident, spinal surgery or any other surgery, any neurological disorders, pregnant and severely fallen ill recently, and any eye injury.

After obtaining permission from the institutional ethical committee, 30 banks were identified in the field practice area of Teaching Medical Institution. The identified banks were divided into 21 government and 9 co-operative banks. Each of these banks were approached and permission was acquired from the respective bank managers to conduct the study on their bank employees. Out of 30 banks, 12 Government sectors banks and 5 Co-operative sector banks granted permission and therefore, based on census enumeration method, all the bank employees from these 17 banks were included i.e. 221 bank employees (144 Government and 77 Co-operative bank employees).

A predesigned, pretested semi structured questionnaire was used encompassing socio-demographic data along with their occupational and professional history, working and environmental history related to the ergonomic conditions prevalent in the banks; questions related to visual status of the bank employees working on computers; and questions related to mental ill-health of the bank employees. DASS 21 (Depression Anxiety Stress Scale) was used to assess the mental health status.16 General and systemic examination of the study subjects along with visual acuity examination done with the help of Snellen's vision charts. Environmental history of the banks i.e. illumination, temperature, humidity, ventilation and working area of the banks.

## RESULTS

The mean age of study subjects in Government sector banks and Co-operative sector banks was 39$\pm$7 years and 38$\pm$6 years respectively with male to female ratio being 1.3:1 in both the sector employees. It was found that musculoskeletal symptoms, visual symptoms, stress and keyboard related symptoms due to computer use in Government sector bank employees had significant association ($p<0.05$) with age. While in co-operative sector bank employees only musculoskeletal symptoms and visual symptoms had a significant association with age. Most of the bank employees i.e 156/221 (70.58%) had completed their post-graduation and majority of them i.e., 162/221 (73.30%) belonged to upper class according to Modified Kuppuswamy Socio-economic Classification.

**Table 1: Working And Environmental History Of Bank Employees From Government And Co-operative Sector Banks.**

| Sr.No | Working history of Bank employees | Government employees | Co-operative employees |
|---|---|---|---|
| 1. | Mean duration of service in Banking sector | 14.65+7.24 years | 11+6.50 years |
| 2. | Mean duration of using Computers | 11.30+4.69 years | 10+5.12 years |
| 3. | Working hours per day (including overtime) | 5 hours/day | 4 hours/day |
| 4. | Time spent on Computers at work | 5 days/week | 5 days/week |

54 out of 144 (37.50%) Government bank employees and 21 out of 77 (27.27%) Co-operative bank employees found the arrangement of their sitting chair and computer desk as uncomfortable and 76 out of 144 (52.77%) Government bank employees and 32 out of 77 (41.55%) Co-operative bank employees were using sitting chairs which were not ergonomically designed. Table 2 shows the various morbidities in the study subjects some of which are related to use of computers at workplace. The most common morbidities (Table 2) in Government bank employees were musculoskeletal discomfort (73.61%), visual symptoms (61.80%), addictions (60.45%) followed by keyboard related symptoms (59.02%) while in Co-operative bank employees were keyboard related symptoms (61.03%), musculoskeletal disorders (59.74%), addictions (54.54%) and visual symptoms (44.15%).

**Table 2: Morbidities In Government And Co-operative Sector Bank Employees.**

| Sr.No | Morbidities in study subjects | Government bank employees (n=144) | Co-operative bank employees (n=77) |
|---|---|---|---|
| 1. | Musculoskeletal symptoms | 106(73.61%) | 46 (59.74%) |
| 2. | Visual symptoms | 89 (61.80%) | 34 (44.15%) |
| 3 | Keyboard related symptoms | 85 (61.80%) | 47 (61.03%) |
| 4. | Stress | 60 (41.66%) | 22 (28.57%) |
| 5. | Anxiety | 34 (23.61%) | 9 (11.68%) |
| 6. | Depression | 58 (40.27%) | 24 (31.16%) |
| 7. | Obesity | 60 (41.66%) | 28 (36.36%) |
| 8. | Addictions | 87 (60.41%) | 42 (54.54%) |
| 9. | Low vision | 53 (36.80) | 28 (36/36%) |

The most common site of pain among 106 (73.61%) Government bank employees who experienced musculoskeletal symptoms due to computer use was Upper back (36.93%) and lower back (26.70%) followed by neck (18.18%). It showed significant association with factors like duration of service in banking sector, level of desktop at workplace and ergonomic design of sitting chair ($p<0.05$). 85 out of 144 (59.02%) Government bank employees and 47 out of 77 (61.03%) Co-operative bank employees experienced keyboard related symptoms most common symptom being stiffness of fingers and hands (50.64%) in Government bank employees while Tingling sensations in 44.80% Co-operative bank employees. Significant association was found between symptoms related to keyboard use and duration of service ($p<0.05$) in Government bank employees. The most common visual symptoms in Government bank employees were irritation of eyes (34.80%) while in Co-operative bank employees it was watering of eyes (28.40%). It was found that 60 out of 144 (41.66%) Government employees and 22 out of 77 (28.57%) co-operative bank employees experienced Stress at workplace (According to DASS Scale). Government employees showed significant association of stress with age, duration of service, addictions while Co-operative bank employees showed significant association of Stress with age, duration of using computers and exercise ($p<0.05$). Illumination was measured using Digital Lux meter. According to the calibration and operation manual provided with the instrument, the recommended levels of illumination for office work (typing and drafting) is 1000 to 2000 Lux. 5 out of 12 Government banks (55.55%) and 2 out of 5 Co-operative banks (40.00%) Co-operative banks showed low levels of illumination.

## DISCUSSION

In the present study, among the 221 interviewed Government and Co-operative bank employees, 132 (59.72%) were males and 89 (40.27%) were females. The mean age of Government and Co-operative sector bank employees in the study was 39±7 years and 38±6 years respectively. Moom et al in their study found that 60% were males and 40% were females and mean age of bank employees to be 30.20±8.1 years which is similar to present study.[16] It was found that 106 (73.61%) Government employees experienced musculoskeletal pain or discomfort, site of pain were noted as 36.93% had pain/discomfort in upper back, 26.70% in lower back, 18.18% in neck, 17.04% in shoulders, 13.06% in hips, 19 (10.79%) in wrists, 9.09% in knees, 15 (8.52%) in fingers and 9 (5.11%) in hands. Similarly, Mohammadi observed in their study the highest prevalence of symptoms was found in the body part upper back (56%) followed by (49.76%) lower back, forearm (40.84%), neck (40.37%), hips (35.21%), knees (30.98%), upper arm (30.04%), shoulders (24.88%), wrist (23.94%).[17] Shrivastava et al found that 88 (44%) subjects experienced stress related to work. In the present study, out of 144 Government bank employees, 60 (41.66%) experienced stress in their job.[18] Musculoskeletal symptoms in both Government and Co-operative sector bank employees were significantly co-related with age and duration of service (in years). Sulaiman et al in their study also found that there was a significant correlation between MSD and job tenure.[19]

## CONCLUSION

42.76% of Government study subjects spent 6-7 hours working on computers and laptops per day while 41.47% Co-operative study subjects spent 4-5 hours per day. Due to increased use of computers and time spent working on them was more in Government sector bank employees, the prevalence of musculoskeletal symptoms, visual symptoms, stress, obesity, addictions were significantly higher as compared to Co-operative sector bank employees. Keyboard related symptoms and low vision were reported equally among both the sector employees. Government sector bank employees showed maximum use of visual aids as protective measures against computer vision syndrome as compared to co-operative sector. Stress had significant co-relation with computer usage at workplace in both Govt. and Co-operative banks. In addition, Govt. bank employees showed significant association of stress and addictions, mainly smoking (36.76%). According to the Besancenot classification of Discomfort Index, on calculation it was found study subjects from 8 out of 12 (66.66%) Government banks, 2 out of 5 (40%) Co-operative banks were at discomfort due to 'Hot' condition in the banks. Both the Govt. and Co-operative banks did not show the recommended levels of illumination according to the readings of Digital Luxmeter.

### Limitations

The study does not include all the government and co-operative banks which lie in the vicinity of the tertiary care hospital as only a few of these banks granted permission to conduct the study. The study includes bank employees of age group 25-50 years. Though the age of retirement according to government of India is 58 years, the age-related changes and associated deformities cannot be over-ruled. Therefore, the study does not include bank employees above 50 years.

### Recommendations

All the Government and Co-operative banks should adopt Ergonomic Workplace Design (Picture 1) for better health, wellbeing and productivity of bank employees. The most common morbidity in both the bank sectors was musculoskeletal disorders and to prevent it, workstation modification should be done by making adjustments of screen, mouse, keyboard, forearm support and chair according to one's comfort. Change of posture often is recommended to prevent stiffness of muscles. To avoid stress, limiting the hours of computer usage or 5 days a week work concept can be adopted, also yoga, recreational activities, guidance and counselling sessions may be implemented. The working premises inside the banks should be adequately illuminated through proper artificial lightening. Banks should conduct preemployment tests and visual examination for all the selected bank employees in order to rule out any preexisting health condition in the employee. Banks should organize educational and training sessions/health talks/lectures on Occupational health and Safety for all the bank employees of Government and Co-operative sector.

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