

Studies on Health Problems of Software People: A Case Study of SAP Lab Gurgaon in India

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Abstract—In the present paper, the various health problems of the employees working in SAP LAB Gurgaon has been studied on the basis of answers received from the employees for the given questionnaire. All employees frequently use laptop at home. Also some of employees use desktop / workstation as alternative to laptop. Almost all employees use laptop at their workplace, as all the responses indicate the use of laptop. It can be concluded seeing the responses that still today there is a need for wide advertisement in media about various problems generated from working on computers and the companies must do something for the better health of their employees.

Index Terms—questionnaire, health problems, laptop, blurred vision, tight neck, hypertension.

I. INTRODUCTION

SAP Labs India is SAP's second largest Research & Development and Global Services & Support centre in the world. Founded in November 1998, SAP Labs India is one of the four global development hubs (Germany, US and Israel being others) of SAP that contribute to all areas of the SAP product value chain- Research & Breakthrough Innovation, Product Development, Global Services & Support and Customer Solutions & Operations. SAP's eight Labs in different countries are industry role models for globally distributed development organizations and contribute heavily to the goals of SAP's business units. Bridging the gap between local market demands and SAP's development organization, SAP Labs set standards for excellence in innovation, efficiency, and reliability. SAP Labs India researches, designs, and delivers leading-edge software applications that enhance and extend SAP® solutions, and is recognized within the SAP global organization as one of the prime contributors of innovation, quality and service. Of SAP Labs India's headcount, about 25% is committed to research and next generation product development. It is SAP's largest location for SRM development, instrumental in delivering SRM 6.0 as well as development of SRM 7.0. The Central Test Lab for Global Application Platform development, SAP Labs India also contributes to 2/5th of global ERP development as well as the development of latest CRM solutions. It has complete ownership of delivering solutions for industries such as Hi-Tech, Apparel and Footwear Solutions (AFS) and SAP CRM for Pharmaceuticals, along with a significant contribution to SAP's Oil and Gas Downstream solution. SAP Labs India is also the prime contributor to the global development for latest applications such as x Apps and Duet. As a Global Services and Support organization, Labs India boasts of the

largest production team outside Germany providing assembly, validation and test services, and is credited as being the largest testing centre within SAP. Accounting for close to 50% of SAP custom development, Labs India also provides remote maintenance services to roughly 8/10th of North American customers. SAP understands that the only industry that matters to you is your industry. That's why there's no such thing as a generic industry solution from SAP. Their business services & solution sets are based on an in-depth knowledge of the processes that drive business. So one can make better, more informed strategic decisions in the areas most important to him -- whether one wants to gain greater visibility across his enterprise, get closer to his customers, or reduce inefficiencies. And since SAP has been working with many businesses for 30 years, it understands the demands of any industry.

II. LITERATURE REVIEW

Margit Koller [1] worked on biorhythmic and psychosocial desynchronization, as well as the frequent prevalence of combined effects of adverse environmental and working conditions and medical surveillance during engagement in shift and night work and his findings are as follows:-

An occupational health service to plan health supervision and measures for shift and night workers considering the adverse environmental and working conditions. The measures taken should be preventive to reduce the expected health risks rather than being rehabilitative. Recommendations that should be applied in all countries and enterprises are in accordance with the ILO Night Work Convention 1990a and include: (1) appropriate occupational health services provided for night and shift workers, including counselling; (2) first aid facilities during all shift hours; (3) the option of transfer to day work when certified unfit for night work for reasons of health; and (4) measures for women on night shifts, in particular special maternity protection (transfer to day work, social security benefits or an extension of maternity leave). workers exposed to night shifts under defined single or combined additional heavy workloads are entitled to a special health assessment, additional rest pauses, additional free time and early retirement depending on years of exposure. Examples of occupational health services already installed in some states for shift and night workers, and information on future developments are given. Up to now the medical service has been implemented mostly on the basis of collective agreements rather than on the basis of legal provisions. The Austrian Night Shift/Heavy Work Law Regulations of 1981,

revised 1993.

Aslaug Mikkelsen, Torvald ogaard, Preben H. Lindoe, Odd Einar Olsen [2] worked on antecedents of computer anxiety and their findings are as follows:-

Many of the stressors of human computer interaction at work are similar to stressors that have historically been observed in automated jobs (Smith, Conway, & Karsh, 1999). These include job demands, such as high work load and work pressure; diminished job control, and inadequate employee training to use new technology. Many of the stressors of human computer interaction at work are similar to stressors that have historically been observed in automated jobs (Smith, Conway, & Karsh, 1999). These include job demands, such as high work load and work pressure; diminished job control, and inadequate employee training to use new technology. Mean age of the respondents was 41 years (S.D.=10.5). Mean number of years at school was 12 years (S.D.=4.1), and mean duration of employment at present company was 15 years (S.D.=10.6). Twenty percent of the sample was female. Twenty-nine percent of the respondents report that they do not use computers at work, while about 65% claim to use computers every day. Average time spent at the computer for those who report daily computer use is 3.3 h. so those who works longer hours on computer are more vulnerable to health problems.

Paul H.P. Yeowa, Rabindra Nath Sen [3] worked on Workstation design, Occupational health and safety and their findings are as follows:- Before the ergonomic interventions, operators in the FCT process were facing arm and trapezius muscles static work fatigue. They had to lift their arms for long hours because the WETs tables did not have any place for resting their arms. There was poor economy of motion because the operators had to hold their arm and hand, and stretch to reach the oscilloscope switches and computer keyboard, which were located too high and far. Also, the operators found that the projection images during tests were blurred because there was high ambient illumination on the projection screen.

Sylvie Montreuil, Katherine Lippel [4] worked on occupational health issues associated with home based telework social, ergonomic and regulatory issues relevant to health and safety of teleworkers and their findings are as follows:- Home-based telework is usually performed with a computer as the principal working tool. It is a recognized fact that computer use is often associated with a static and constraining posture, repetitive movements, extreme positions of the forearm and wrists, as well as long periods of continuous work (Cail and Floru, 1993). These risks are recognized for contributing to the development of musculoskeletal problems in the neck, shoulders, wrist, hand and lumbar regions. One strategy for preventing or attenuating the effect of these risk factors is the use of properly designed equipment and furniture that can be adjusted to the individual and the type of work. An adapted work station should allow the user to enjoy more balanced and varied natural positions for the upper limbs and back. On the other hand, it seems that suitable equipment and adaptable furniture does not guarantee adequate adjustment (Green and Briggs, 1989). Two possibilities exist: user

training and technical assistance for installation. there is a higher risk of musculoskeletal symptoms when exposure level (duration) increases (dose-response relationship). Furthermore, it is possible that a poor psychosocial work environment (poor task content, heavy psychological demands and poor social support) may contribute to musculoskeletal problems (Bongers et al., 1993). Moreover, having to respond to clients within a time-constraint context and using computer equipment that is poorly adapted to the clients' needs, may result in a situation that is conducive to the onset of health problems, particularly musculoskeletal disorders (Sznalwar et al., 1999).

Ashraf A. Shikdar, Naseem M. Sawaqed [5] worked on factors that affected worker productivity, ergonomic conditions and consequent loss of worker productivity and reduced health and safety in industries and their findings are as follows:-

Fifty-four percent of the managers reported hot environmental conditions, 28% a noisy environment, and 26% a lack of resources and facilities. Managers received worker complaints of fatigue, back pain, upper-body pain, hand and wrist pain and headaches. Management (88%) acknowledged not having knowledge or access to ergonomics information. Ninety-four percent of the companies did not carry out ergonomic assessments. A significant correlation ($p < 0.01$) was found among productivity indicators and health and organizational attributes. Analysis indicates that specific ergonomic problems exist in most of the industries. They include (1) with regard to employees: back pains/backaches, upper-body and neck pains/aches, hand and wrist pain and discomfort, fatigue, stress and dissatisfaction; (2) with regard to work and workplace design: manual materials handling, hand tools, machines, workstations; (3) with regard to the environment: heat, humidity, noise and dust. Managers received workers' complaints of fatigue, back pain, upper-body and neck pain and hand or arm soreness. In an earlier study ([Shikdar et al., 1993]) it was found that operators were unable to work in normal standing or sitting postures due to poorly designed and installed machines, poorly designed tasks, inappropriate work heights and lack of suitable work chairs. It is evident that worker complaints received by managers could be attributed to ergonomic deficiencies. Shows some of the most common worker complaints reported with respect to health and safety.

Gert Zulch, Tim Grieger [6] worked on macro-ergonomic Occupational health and safety approach to digital work systems, work system and their interactions and their findings are as follows:-

The work system analysis has been done in several phases. After the modelling of the 3D layout, the stress values at all workplaces calculated. This allows for an identification of areas with increased stress values. The personnel-oriented simulation tool Engpassorientierte Simulation von Personalstrukturen (ESPE) has been developed in order to solve the problem of assigning personnel to functions and workplaces by taking the flexibility of human resources and the plurality of possibilities for personnel assignment into account. A future

vision is to couple these simulation tools with *ADAMO* in order to combine personnel and production logistic related questions with OHS tasks. With the OHS data modeller *ADAMO*, a tool allowing OHS data to be prognosticated and documented in a virtual representation of a work system and for this to be used in the prognosis of stress situations, has been created. An important characteristic of *ADAMO*, aside from the 3D representation of the work system in a computer model, is the possibility to forecast different stress types in one integrated model of the work system. This is an essential prerequisite for the integration of OHS into the digital factory since it avoids the creation of a new model for every stress type in usual ergonomic calculation tools, which is, for temporal and economic reasons, too expensive. Due to the advanced development in the area of the digital factory and due to the fact that well-known companies are fostering its development, the existing approaches must still be enhanced. This will allow for a timely integration of OHS aspects into the digital factory.

Z. Whysall, C.Haslam, R.Haslam [7] worked on occupational ill- health, musculoskeletal disorders (MSDs), and physical work environment and their findings are as follows:-

The most common form of occupational ill- health in many of today's industrialised nations, is musculoskeletal disorders (MSDs). MSDs include a range of conditions affecting the muscles, tendons, ligaments, joints, and nerves. These include tendon inflammations (e.g. tenosynovitis), nerve compression disorders (e.g. carpal tunnel syndrome), as well as low back pain, and other regional pain syndromes. In 2002, MSDs accounted for 487, 900 (34%) of injuries and illnesses in the US involving days away from work, at an estimated cost of around \$2 billion annually (BLS, 2004). In managing MSDs, WHO (1988) recommended that organisations combine ergonomics improvements (such as rotation, workstation redesign, or the introduction of new tools and/or equipment) with health promotion activities aimed at modifying behaviour. Currently, however, there appears to be little evidence of this in practice (Whysall et al., 2004), with consultants focusing almost entirely on the physical aspects of the work environment, tending to neglect the more 'psychological' aspects of the interaction between the worker and their work environment. Such an approach not only overlooks the importance of behaviour change in effectively reducing health and safety risks, but also that of psychosocial factors, which have been associated with MSDs (e.g. Harkness et al., 2003; Eriksen et al., 2004). The most common form of occupational ill- health in many of today's industrialised nations, is musculoskeletal disorders (MSDs). MSDs include a range of conditions affecting the muscles, tendons, ligaments, joints, and nerves. These include tendon inflammations (e.g. tenosynovitis), nerve compression disorders (e.g. carpal tunnel syndrome), as well as low back pain, and other regional pain syndromes. In 2002, MSDs accounted for 487, 900 (34%) of injuries and illnesses in the US involving days away from work, at an estimated cost of around \$2 billion annually (BLS, 2004). In managing MSDs, WHO (1988) recommended that organisations combine ergonomics improvements (such as rotation,

workstation redesign, or the introduction of new tools and/or equipment) with health promotion activities aimed at modifying behaviour. Currently, however, there appears to be little evidence of this in practice (Whysall et al., 2004), with consultants focusing almost entirely on the physical aspects of the work environment, tending to neglect the more 'psychological' aspects of the interaction between the worker and their work environment. Such an approach not only overlooks the importance of behaviour change in effectively reducing health and safety risks, but also that of psychosocial factors, which have been associated with MSDs (e.g. Harkness et al., 2003; Eriksen et al., 2004).

Jocelyn Sackey, Mohammed-Aminu Sanda [8] worked on the high prices organizations pay for the work-related stresses their women managers experience at the workplace, which impact negatively on their mental health, and by implication their productivity and their findings areas follows:-

Women bear the extra stress of worrying about domestic factors – work and home conflict are associated with high stress in employed women and such stress takes its toll on a woman's physical and mental health. The stress of carrying out two full-time jobs (in the labor force and at home) is wearing many women out. Yet women by and large, are unprepared for the degree of conflict that arises between domestic and career responsibilities. The study has shown that a number of the stressors being experienced by managerial women are causing psychological strains and high turnover. Since these strain symptoms are predictors of ill- health, there is cause for concern for the health prognosis of women managers. From an organizational perspective, these strain symptoms must surely be affecting the job performance of these managers. Such stress symptoms as being unable to concentrate; becoming less communicative, feeling tense, uptight, tired, low energy, excessive fatigue; and job dissatisfaction are indications that they are probably not performing at the high level required by their demanding and critical job. Furthermore, since these stressors predict future ill- health, organizations should be concerned that the women managers' job performance may deteriorate in the future. The intriguing finding that strain symptoms decrease with the age of the women may mean either that these women adapt to the strains with age or that these managers are leaving their jobs just when they become most knowledgeable and valuable to their organizations in their roles as managers; where the latter explanation is true, organizations are paying a high price for the stress their women managers are experiencing. Geeta Kumari, K.M.Pandey and S.S. Khanka worked on the various health problems of the employees working in GCE and GIMT Gurgaon. This topic has been studied on the basis of answers received from the employees for the given questionnaire. Very few employees frequently use laptop at home. Also most of employees use desktop / workstation as alternative to laptop. Almost all employees use desktop at their workplace,. It can be concluded seeing the responses that still today there is a need for wide advertisement in media about various problems generated from working on computers and the companies must do something for the better health of their

employees. Now the same methodology has been applied to see the issue in software industry and the case study of SAP LAB Gurgaon has been taken to see the effects.

III. METHODOLOGY OF THE STUDY

The questionnaires were distributed to 23 employees of SAP Lab in Gurgaon and the answers are analyzed for the purpose of analysis. The answers are discussed in detail in the results and discussion section of this paper

The present study was done with an objective of studying computer related health problems and the role of ergonomic factors, likely to be associated with computer related health problems. The primary service providers in the IT industry are grouped into: IT software industry, IT enabled service, Internet and e-commerce. There are about 916 IT providers registered with National Association of Software and Service Companies (NASSCOM) all over India, of which 202 IT providers or registered in NCR. The study design was cross sectional. The sample design used was stratified random sampling. Based on the studies in the west and taking into account time constraints sample size of 200 was taken. The study subjects were drawn from software developers (NIIT) 82, Call centres (V- Customer Care) 54 and Data entry/ Processing (NIC) 64 to have an adequate representation from all sectors of IT industry. The study period was one year from April 2002 to March 2003. T stratification was done on the basis of, number of working years on computers of the IT professionals. The inclusion criteria for subjects to be considered for the study were they should be working in the current job for past 6 months. He/she should be working on computers for at least 3 h/day or 15 h/week. The study subjects were administered a pre designed pre tested semi structured questionnaire covering details like age, working hours working environment, experiencing of any problem while working on computers and kind of problems perceived. To assess the musculoskeletal problems a standardized Nordic Questionnaire was administered. The depression was measured using Zung's self rating scale.

The working environment of each individual was assessed separately with respect to position of monitor, distance of monitor from the user, use of antiglare screen, type of chairs, use of foot rests, position of elbow and legs, position of body number of breaks and manner of holding the mouse. The use of furniture specifically designed for computer use was taken as appropriate. In the present study sitting straight and leg at an angle with feet well supported, elbows and arms supported in neutral position while working, was taken as appropriate while any other position was considered as inappropriate. The position of monitor in level with the horizontal gaze of the subject was taken as appropriate. The light grip used for holding the mouse was considered as correct manner of holding the mouse. Statistical appraisal was done by univariate analysis using chi – square test. Based on the present study it was evident that very high morbidity attributed to computers has already taken roots in IT professionals and is a matter of great concern. Research Methodology is a way to systematically solve the research problem. According to Califford Woody, "Research comprises of defining and redefining problems, formulating

hypothesis or suggested solutions; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis."

Research is the art of scientific investigation in order to find out facts and solution of a particular problem. It is the search for knowledge

Research Instruction	Questionnaire	
Questionnaire form		Structured
Research Design		Exploratory
Data Collection		Primary

data as well as secondary data

IV. RESULTS AND DISCUSSIONS

Q. 1 Do you have any Health Problems?

- a. Yes b. No

TABLE - 1

Alternatives	% of people having Health Problems
A	100.00%
B	0.00%

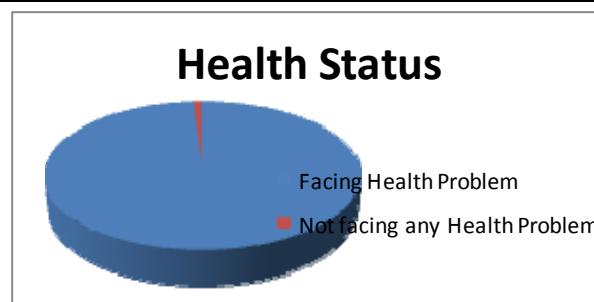


Figure-1 Health Status of employees in SAP Labs Pvt. Ltd.

The above Figure-1 shows the response of employee's health status. In SAP Labs Pvt. Ltd., many employees are facing some health problems. In this organisation almost all the employees are aware of the work area and the factors which affect their health. They are helpless due to their work demand. Here the 1% employees are not facing any health problem as they take some precautionary measure.

Q. 2. How many hours do you work on computer?

- a. Less than 2 hours b. 2 to 5 hours
c. 5 to 7 hours d. 7 hours or above.

TABLE - 2

Alternatives	% of Employees
Less than 2 hours	00
2 to 5 hours	01
5 to 7 hours	04
7 hours or above	95

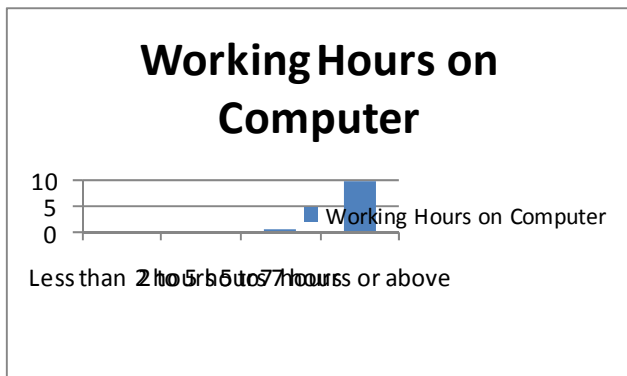


Figure-2 Working Hours on Computer

The Analysis of data reflects that almost all employees work on computers for 7 hours or above. They cannot reduce their work hours easily due to requirements of their profile.

Q.3. Which of the following body parts you feel affected / aching?

- (a) Arms (b) Neck (c) Back (d) Head / Forehead (e) Eyes

TABLE-3

Affected Body Parts	No. of Employees	% of affected Employees
Arms	3	13.04
Neck	6	26.08
Back	18	78.26
Head/Forehead	0	0.00
Eyes	4	17.39

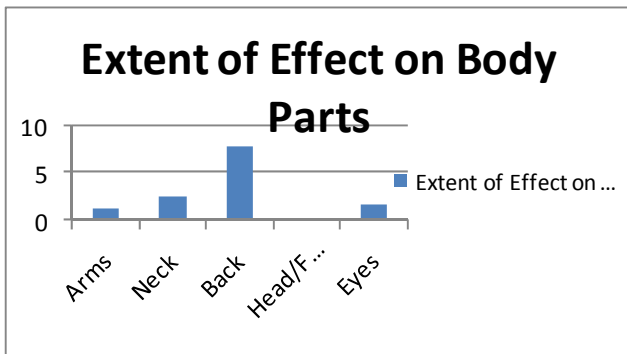


Figure-3 Extent of Effect on Body Parts

The above Figure-3 shows the extent of bad effect on various body parts of the employees. It is observed that most of the employees face problem in their back.

Q.4. Which of the body part you feel most hurt?

- (a) Arms (b) Neck (c) Back (d) Head / Forehead (e) Eyes

TABLE-4

Affected Body Parts	No. of Employees	% of affected Employees
Arms	3	13.04
Neck	6	26.08
Back	18	78.26
Head/Forehead	0	0.00
Eyes	1	4.35

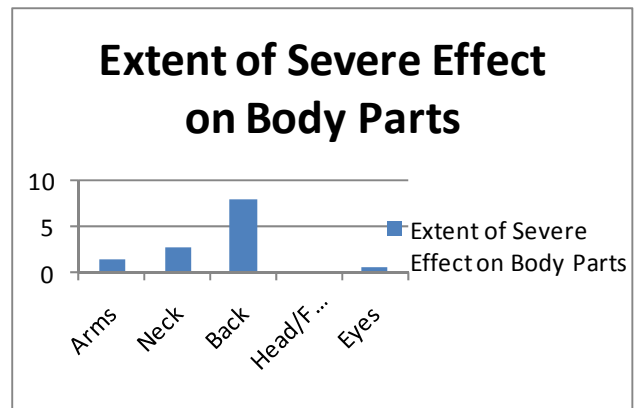


Figure -4 Extent of Severe Effect on Body Parts

The above Figure-4 shows that the extent of most severely affected body parts of the employees. This data shows the proportion of employees facing various problems most severely.

Q.5. Tick those symptoms you feel

- A. Pain or aching in wrists, forearms, elbows, neck, or back followed by discomfort
- B. Numbness, tingling or burning sensation in hand or fingers
- C. Blurred or double vision
- D. Tight, sore neck and shoulder muscles
- General fatigue or tiredness
- E. Reduced grip strength in the hand
- F. Swelling or stiffness in the hand or wrist
- G. Reduced range of motion in the hands, wrist, shoulder, neck, or back
- H. Weakness
- I. Dry, itchy, red or sore eyes (Eye Strain)
- J. Tension stress headaches and other stress disorders

TABLE-5

Alternatives (Problems/Symptoms)	No. of Employees	% of Employees
A	19	82.61
B	2	8.70
C	14	60.87
D	3	13.04
E	5	21.74
F	0	0.00
G	2	8.70
H	1	4.35
I	1	4.35
J	5	21.74
K	2	8.70

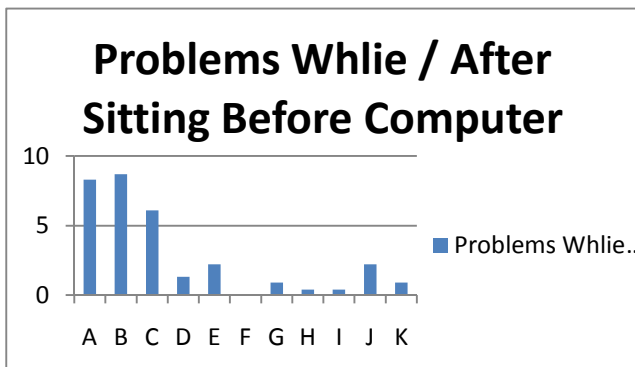


Figure-5 Various problems/symptoms faced by employees while/ after sitting before computer

It is observed that out of above mentioned problems the most faced are “**pain or aching in wrists, forearms, elbows, neck, or back followed by discomfort**” (82.61%) and “**blurred or double vision**” (60.87%). Also it is observed that the least faced problem is “**reduced grip strength in the hand**” (0%) as it has been already been resolved by the practice of “stress busters”.

Q.6. Tick those factors you face while sitting in front of the computer(s) at your workplace.

- A. Awkward and poor posture
- B. Repetitive motions and tasks
- C. Forceful movements
- D. Poor workplace set-up
- E. Sitting in same posture for continuous long hours
- F. Lower back and /or leg support is inadequate
- G. Poor lighting
- H. Documents and monitor screen not at same angle and plane
- I. Keyboard and computer mouse not at same angle and plane

TABLE-6

Factors at Workplace	No. of Employees	% of Employees
A	3	13.04
B	1	4.35
C	3	13.04
D	16	69.57
E	8	34.78
F	5	21.74
G	6	26.09
H	4	17.39
I	6	26.09

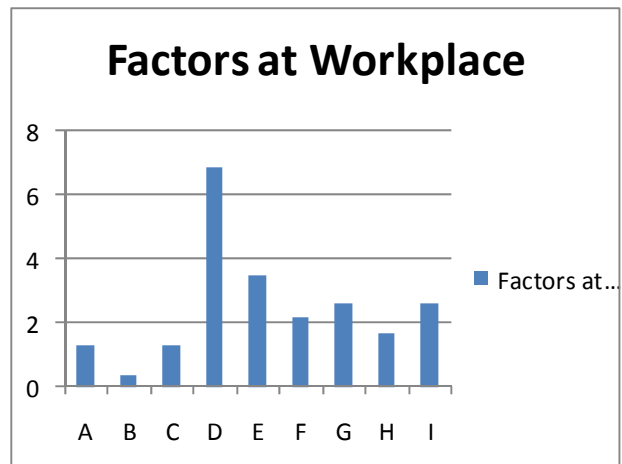


Figure-6 Factors Identified at Workplace

The above Figure-6 shows the proportion of the employees who admit various factors of their health problems being discussed. Most of employees identify “poor workplace set-up” as a cause of their problems (69.57%).

Q.7. Tick those factors you face while sitting in front of the computer(s) at your home.

- A. Awkward and poor posture
- B. Repetitive motions and tasks
- C. Forceful movements
- D. Poor workplace set-up
- E. Sitting in same posture for continuous long hours
- F. Lower back and /or leg support is inadequate
- G. Poor lighting
- H. Documents and monitor screen not at same angle and plane
- I. Keyboard and computer mouse not at same angle and plane

TABLE-7

Factors at Workplace	No. of Employees	% of Employees
A	6	26.09
B	2	8.70
C	3	13.04
D	16	69.57
E	1	4.35
F	2	8.70
G	13	56.52
H	3	13.04
I	2	8.70

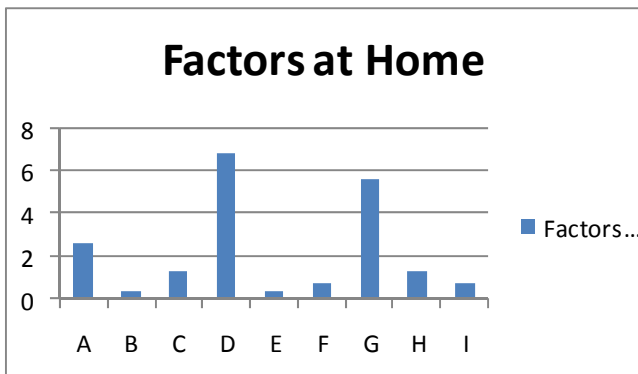


Figure-7 Factors Identified at Home

The above Figure-6 shows the proportion of the employees who admit various factors of their health problems being discussed. Most of employees identify “poor workplace set-up” as a cause of their problems (69.57%).

Q. 8. Specify which machine you use more at workplace?

- (a) Desktop / Workstation
- (b) Laptop

TABLE-8

Machine Used at Workplace	No. of Employees	% of Employees
Desktop / Workstation	0	0
Laptop	23	100

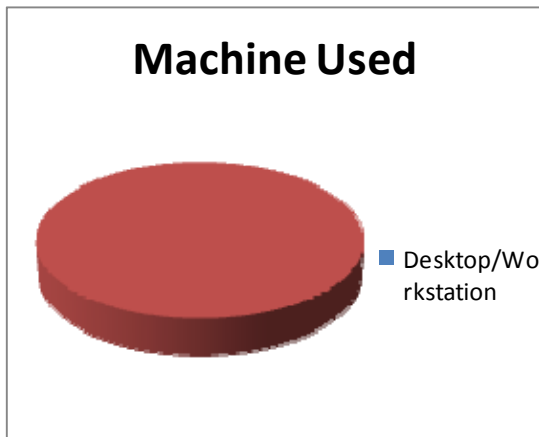


Figure-8

The above Figure-8 shows that almost all employees use laptop at their workplace, as all the responses indicate the use of laptop.

Q. 9. Specify which machine you use more at home?

- (a) Desktop / Workstation
- (b) Laptop
- (c)

TABLE-9

Machine Used at Home	No. of Employees	% of Employees
Desktop / Workstation	3	13.04
Laptop	23	100

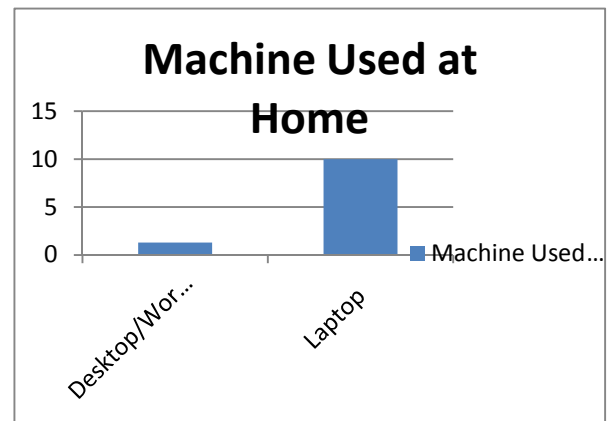


Figure-9

The above Figure-9 shows that all employees frequently use laptop at home. Also some of employees use desktop / workstation as alternative to laptop.

Q10. On which machine you feel the above mentioned Problems?

- (a) Desktop/ Workstation
- (b) Laptop

TABLE-10

Machine	No. of Employees	% of Employees
Desktop / Workstation	1	4.35
Laptop	23	100

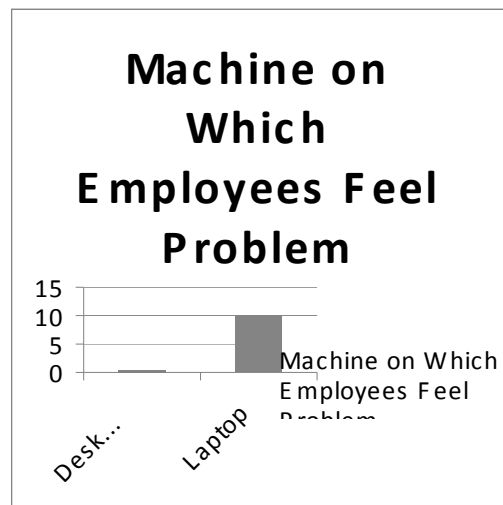


Figure-10

Q11. Has ever your company addressed to these problems?

- (a) Yes
- (b) No
- (c) Neutral

TABLE-11

Alternatives	No. Of Employees	% of Employees
Yes	01	4.35
No	21	91.30
Neutral	01	4.35

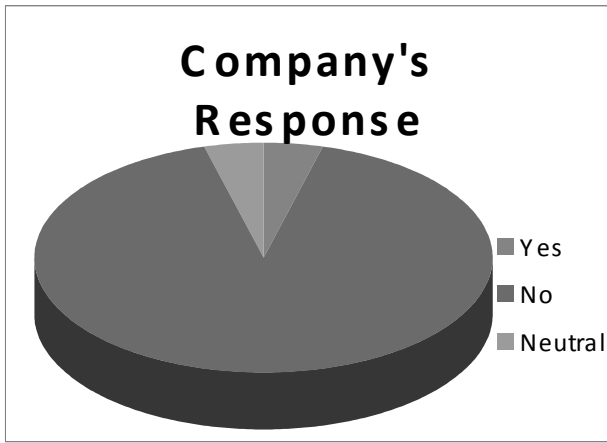


Figure-11

Above Figure-11 shows the employee's feedback that the company has hardly addressed these problems.

Q12. (If the answer to above Question is "Yes") Has your company ever taken any measures to resolve these problems?

- (a) Yes
- (b) No

TABLE-12

Alternatives	No. Of Employees	% of Employees
Yes	00	0.00
No	21	91.30
Neutral	02	8.70

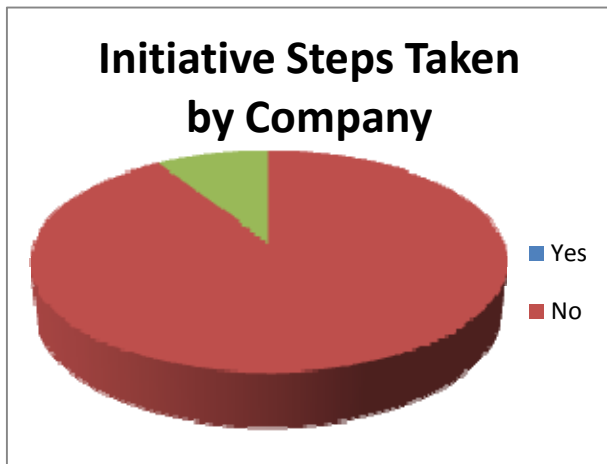


Figure-12

The above Figure-12 shows the employee's feedback that the company has not taken any measures to resolve these problems as they hardly addressed these problems.

Q13. Do you have any knowledge of any preventive measures for these problems?

- (a) Yes
- (b) No

TABLE-13

Knowledge of Preventive Measures	No. of Employees	% of Employees
Yes	14	60.87
No	9	39.13

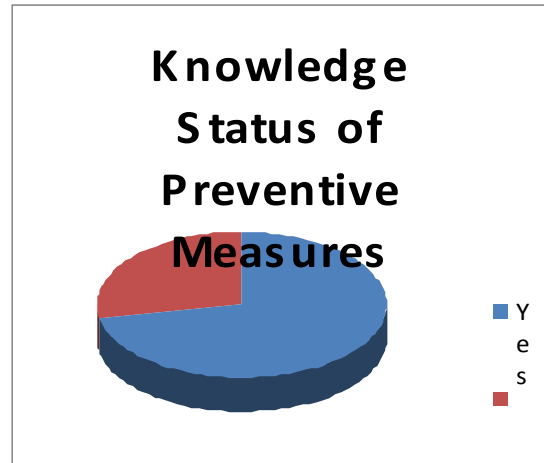


Figure-13

The above Figure-13 shows that large number of employees (60.87%) of this company possess knowledge of preventive measures of the problems under consideration.

Q14. Do you have any knowledge of computer-accessories available in market to overcome these problems?

- (a) Yes
- (b) No

TABLE-14

Knowledge of Preventive Measures	No. of Employees	% of Employees
Yes	7	30.43
No	16	69.57

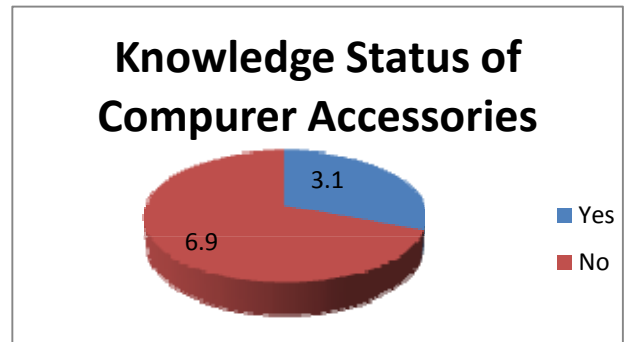


Figure-14

The above Figure-14 shows that very few employees (30.43%) of this company possess knowledge of various computer-accessories which can help in preventing the health problems under consideration.

Q15. (If the answer to above Question is "Yes") Which of the following accessories you knew?

- (a) "Best-fit" computer mouse designs
- (b) Adjustable keyboard trays
- (c) Foot Rests
- (d) Monitor Arms
- (e) Task Lighting
- (f) Document Holders
- (g) Gel Wrist Pads

TABLE-15

Computer Accessories	No. of Employees having knowledge	% of Employees having knowledge
(a) "Best-fit" computer mouse designs		
(b) Adjustable keyboard trays		
(c) Foot Rests		
(d) Monitor Arms		
(e) Task Lighting		
(f) Document Holders		
(g) Gel Wrist Pads		

"Best-fit" computer mouse designs	2	8.70
Adjustable keyboard trays	4	17.39
Foot Rests	6	26.09
Monitor Arms	4	17.39
Task Lighting	2	8.70
Document Holders	2	8.70
Gel Wrist Pads	3	13.04

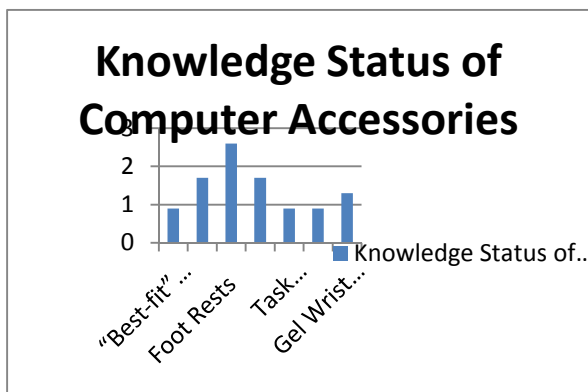


Fig. 15

The above Figure-15 shows that among those possessing knowledge of these accessories (7 respondents), only 2 know about "Best-fit" computer mouse designs & Document holder and only 4 know about Adjustable keyboard trays and Monitor Arms.

V. CONCLUSIONS

It can be seen from the answers that very few respondents of the lab know about best fit computer mouse designs, adjustable key board trays and monitor arms. Very few employees (30.43%) of this company possess knowledge of various computer-accessories which can help in preventing the health problems under consideration. Large number of employees (60.87%) of this company possess knowledge of preventive measures of the problems under consideration. The employee's feedback reflects that the company has not taken any measures to resolve these problems as they hardly addressed these problems. All employees frequently use laptop at home. Also some of employees use desktop / workstation as alternative to laptop. almost all employees use laptop at their workplace, as all the responses indicate the use of laptop. It can be concluded seeing the responses that still today there is a need for wide advertisement in media about various problems generated from working on computers and the companies must do something for the better health of their employees. We can see that nobody in the lab is having perfect health. There is a need for wider advertisement.

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