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"Analysis of disability and pain in Computer Professionals with Neck Pain"

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Abstract: *Little is known about the relationship among impairments, functional limitations, and disability concerning the cervical spine. This relationship is very important in diagnosing the cause of the disability and pain in the computer professionals.* ***Aim:*** *To determine the relationship between level of disability, intensity of pain and working hours in computer professionals with neck pain.* ***Methodology:*** *The present study is descriptive and co-relational in nature. Seventy computer professionals, symptomatic for neck pain, aged 20-40 years (mean age = 29.43 years), were included in the study. The subjects were of either sex and were having neck pain for a minimum of 4 weeks. All the subjects were assessed for the intensity of pain and level of disability using Visual Analogue Scale and Neck Disability Index respectively.* ***Analysis and Results:*** *Karl Pearson's Correlation Coefficient has been used for statistical analysis. The results showed a statistical significant positive correlation between level of pain and working hours (r = 0.185), level of disability and working hours (r = 0.165), as well as pain and level of disability (r =0.798).* ***Material:*** *Visual Analogue Scale, Neck Disability Index.* ***Conclusion:*** *There exists a significant relationship between level of disability and intensity of pain as well as working hours in computer professionals with neck pain.*

Keywords: *Neck Pain, Computer Professionals, Disability, Working hours*

I. Introduction

The development of computer and information technology is perhaps one of the most dominating factors in the ever-changing working life of today. The 1990s saw a rapid computerization of Swedish working life [1] and the number of computer workers is continuously increasing. Studies on adult work life support a hypothesis that computer-related activities can cause Neck Pain and Low Back Pain in the young.[2] Neck symptoms have been associated with low or high screen position, shoulder symptoms with high screen position and shoulder elevation in computer mouse users,[3] and the risk of Neck Pain with poor placement of keyboard.[4]Major causes of many of these disorders and injuries are technological advances (e.g., faster more powerful computers), increased use in repetitive motions, competitive work environments, inflexible workstations design, and poor education/training on proper workstation design.[5] In 1999, nearly 1 million people took time away from work to treat and recover from work related musculoskeletal pain or impairment of function in the low back or upper extremities.[6]India being the forerunner in the cyber world, there is an urgent need to understand the dynamics of these problems and prevent it from assuming epidemic proportions.[7]This wave of musculoskeletal disorders has led workers, employers, unions, clinicians, insurers and policy-makers to ask 3 important questions: Is neck pain an important source of disability? Do physical and psychosocial exposures at the workplace contribute to the development of neck pain? Can we modify the workplace to reduce the burden of disability associated with neck pain? As we demonstrate with our review, these questions have generated a large body of research aimed at identifying the risk factors of neck pain in workers.

However, answering these questions poses significant challenges. First, it is difficult to precisely determine the onset of neck pain in individuals. It appears that, in today's workplaces, most neck pain develops gradually and follows an episodic course throughout people's lives.[8]The commonest site of pain felt by most of computer workers after a working spell of 3 to 4 hours was the lower cervical, supra- scapular, upper dorsal and at the inter scapular region, which usually abated after taking rest.[9,10]The identification of factors that predict chronic disability may also shed light on why some workers develop chronic disability, and thus guide the development of intervention strategies that may prevent this process from occurring.[11,12]These problems if ignored can prove debilitating and can cause crippling injuries forcing one to change one's profession. The aim was to determine the relationship between maximum working hours, intensity of pain and level of disability in computer professionals.

II. Aim of the study

To determine the relationship between level of disability, intensity of pain and working hours in computer professionals with neck pain.

III. Subject and methods

Research design: Correlation research design was used

A total of seventy computer professionals aged 20-40 years, both males and females were included in the study. The subjects were chosen in and around the region of Jalandhar, Kotkapura, Faridkot, Amritsar, Hoshiarpur, Nakodar, Phagwara and Chandigarh. The design of present study was descriptive and co-relational with purposive sampling. After their written informed consent, the subjects were included if they were having (a) age between 20-40 years, both male and female (b) computer professionals with a computer related work experience of minimum of 6 months and a maximum of 12 years (c) daily working schedule of a minimum of 3 hours and a maximum 18 hours on computers (d) a minimum duration of pain of at least 6 months. Whereas the subjects were excluded from the study if they were, having (a) cervical pain with traumatic causes (b) known history of fractures (c) history of dislocation of cervical spine (d) inflammatory disorders affecting the cervical spine (e.g. Rheumatoid arthritis) (e) P.I.V.D of cervical spine (f) post operative pain and history of tumors (g) doing yoga or any kind of exercise (h) pain prior to the computer related job (i) taking regular treatment for cervical pain (medical or physiotherapy).

IV. Instrumentation

All the subjects were assessed for intensity of pain on VAS, which show good inter-tester and intra-tester reliability on neck pain, Polly E.Bijur demonstrated ICC for all paired VAS scores = 0.97 [95% CI = 0.96 to 0.98] and level of disability on Neck Disability Index for which Vernon and Mior found a good test-retest reliability of with a correlation coefficient of 0.89 (*P (0.05).*

V. Procedure

A purposive sampling method was used to recruit participants for the study. Informed consent was signed from the participants. During the initial phase of study, participants were ensured for confidentiality. Participants then completed the NDI questionnaire and the general information, which contained subjective measurement of the participant's ability to perform daily activities, the duration of job and working hours in front of computer. After all information was collected, the participants continued into the next phase, which involve the measurement of pain on VAS.

VI. Results

The results of the present study has been illustrated in the tables 1. 2. 3.All the ten sub categories of the NDI did not apply to all the participants of the study, resulting in the total score for some of participants being less than 50. To accommodate for the non applicable items in the NDI, the procedure of Haines et al was followed and the average score of remaining items and assigned the average score to the non applicable subcategories.

Karl Pearson correlation coefficients were used to quantify the relationship between intensity of neck pain, level of disability, working hours and duration of job.

Table 1: Correlation between Mean Working Hour Vs Visual Analogue Scale and Neck Disability Index

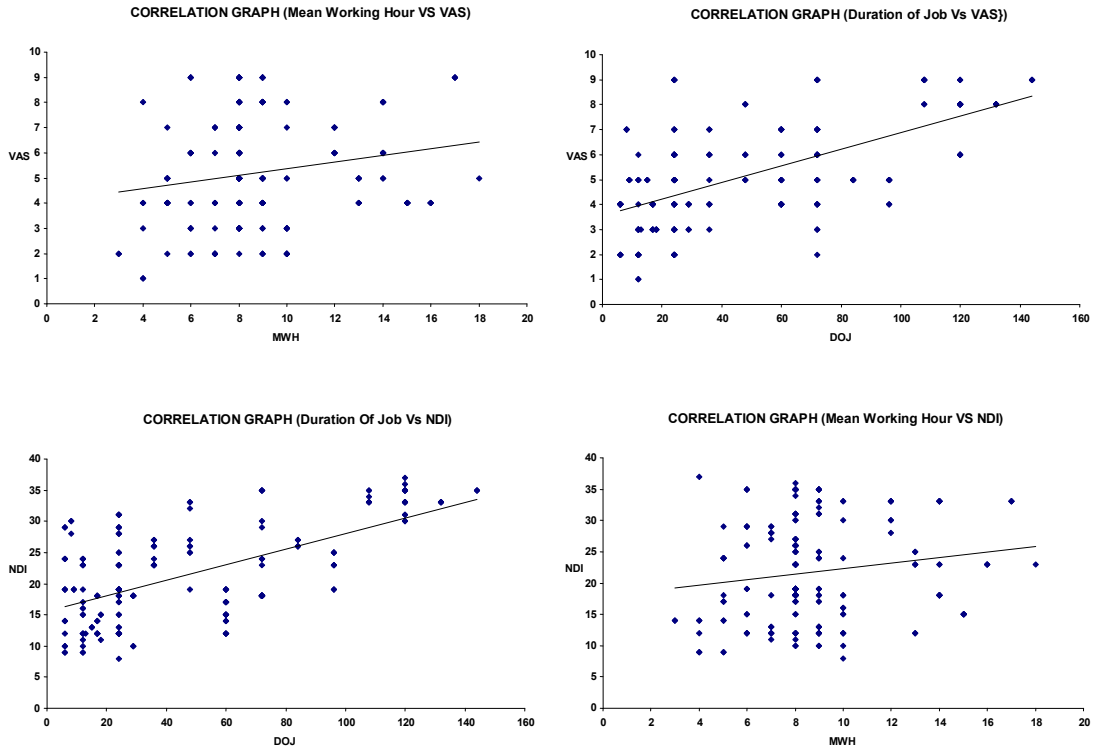
Correlation		
	r value	P value
MWH Vs VAS	0.185	P < 0.05
MWH Vs NDI	0.165	P < 0.05

Table 2: Correlation between Duration of Job Vs Visual Analogue Scale and Neck Disability Index

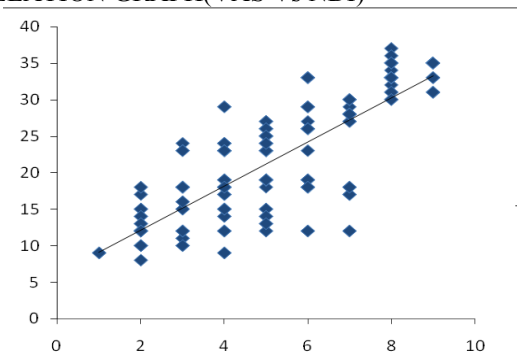
Correlation		
	r value	P value
DOJ Vs VAS	0.630	P < 0.05
DOJ Vs NDI	0.623	P < 0.05

Table 3:Correlation between Visual Analogue Scale and Neck Disability Index

	r value	P value
VAS Vs NDI	0.798	P< 0.05



CORRELATION GRAPH(VAS Vs NDI)



Karl – Pearson co-relation method was used to find the relationship between intensity of neck pain, level of disability, working hours and duration of job..

VII. Discussion

The purpose of this study was to determine the effect of working hours on the intensity of neck pain and level of disability. We hypothesized that the increased working hours would have increase intensity of pain and level of disability. Overall strong correlations were not found to support our hypothesis. This could be because only twenty out of seventy participants have pain on the regular basis.

Pain and disability relationship found in this study was strongly significant (r=0.798) and is supported by the study done by Hermann et al (2001)[12] who found a strong positive correlation between pain and Neck Disability Index in patients with cervical spine disorders. Pain intensity is one of the 10 areas addressed on the Neck Disability Index. A relationship between these two variables is therefore expected .

It can be concluded from the study that DOJ should be considered during treatment of a symptomatic computer professional where as MWH has no impact on symptoms produced. Also disability and pain should be considered together when treating a symptomatic professional as these are highly correlated.

Mean working hours was 5 hours/day. This can be the reason for low correlation. The increase in working hours may lead to more significant results. Whereas mean job duration was 16 months as increase in job duration may give more specific results. The mean age of the participants was 29.43 years; the participants are at very low risk of degenerative changes. So, the therapeutic significance is that pain and disability should be considered as different variables.

The study had definite limitations. First, the sample size is very small. Secondly, lack of sensitivity of NDI such as lifting, driving and recreation did not apply on all the participants tested. Thirdly, degenerative changes occurring at cervical spine were not excluded and may have become the part of data collection. Lastly the environment factor such as travelling and driving were not considered during data collection.
Future study might include larger sample size which may focus on male and female population separately. Additional research could focus on ergonomics to operate the computer. Environmental modification and preventive measure could also be made part of study. Also, further studies could investigate various diagnostic imaging results and their relationship with VAS and NDI scores.

VIII. Conclusion

It can be concluded from the study that DOJ should be considered during treatment of a symptomatic computer professional where as MWH has no impact on symptoms produced. Also disability and pain should be considered together when treating a symptomatic professional as these are highly correlated.

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