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ORIGINAL ARTICLE

Association of Neck Pain in Tie Wearing & Non-Tie Wearing Computer Users

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ABSTRACT

Background: Wearing a neck-tie is necessary for bankers and office workers as per requirement of their job. It is necessary to know about the impact of regular tie-wearing.
Objective: To find out the association of neck pain in tie wearing and non-tie wearing computer users.
Methodology: It was a comparative cross sectional survey, conducted in different banks and offices in Lahore, sample size was 200. Group A: consists of 100 regularly tie-wearing computer users. Group B: consists of 100 regularly non-tie wearing computer users. Neck ROMs were calculated through Goniometer. For neck pain assessment, NDI questionnaire was used. Sample size was calculated through Raosoft software.
Results: A strong association of neck pain was observed in tie wearing population. P value was less than 0.005. Calculated mean value of NDI for tie-wearing was 10.76 and 1.82 for non-tie wearing. Standard deviation value for tie-wearing was 11.273 and 1.410 for non-tie wearing.
Conclusion: It is concluded that there is a strong association of neck pain among computer users with regular tie-wearing.
Keywords: Tie-wearing, non-tie wearing, Neck pain, Computer users.

INTRODUCTION

Neck is the crucial part of human anatomy that supports and allows the head to move. Various bony structures, muscles and ligaments are involved in supporting and moving the head.By the year 2010, the 1 year estimation of the incidence of neck pain was 10.4% and 21.3% with a higher ratio among office and computer workers The prevalence of neck pain among general population ranges from 0.4% to 86.8% whose mean was 23.1% , point prevalence was 0.4% to 41.5% (mean 14.4%) and the prevalence of neck pain in 1 whole year was 4.8% to 79.5% (mean 25.8%)(1)

Some studies suggest that neck and back pain are a cause of mental problems among people. Those who suffer from neck pain might be experiencing anxiety and depression. The association of chronic neck pain with mood disorders is evident through studies(2).

According to a research, wearing a tight neck tie greatly limit the cervical flexion, extension and lateral flexion while working on computer as compared to working without neck tie.(3). Wearing a tight necktie not only linked with limiting the cervical range of motion but it has also seen to reduce the CBF(4). Not only the tight neck tie has impact on C-spine but studies shows that wearing a tight jeans limit normal lumbar and hip movements during trunk flexion which may be the cause of low back musculoskeletal disorders(5).

As with time, there comes a huge change in nature of jobs. Now in most of the official work where one has to spend a lot of time working on computer systems, the complain of work-related neck pain as well as the low back pain has increased. Studies revealed that strengthening exercises for neck muscles and scapular retractors performed on Swiss ball has a better impact in providing stabilization to the neck than mat activities(6). Another study suggest that traditional cupping might also be an effective way in treating chronic and non-specific neck pain(7).

Nevertheless, no study has yet investigated the neck pain occurring as a result of wearing a tight necktie. So the purpose of this study is to look over the association of neck pain in tie-wearing and non-tie wearing population having a similar nature of job as well as the working hours.

Adedoyin et al conducted a study on computer related musculoskeletal problems in 2005.The purpose of this study was to check the association of musculoskeletal related problems with computer usage in Nigeria. The results concluded that computer users have a high incidence of shoulder, neck and back pain that was thought to be associated with the poor ergonomics(8).

In 2006, B.Cagnee et al conducted a cross sectional study on work related neck problems in office employees. The objective of this study was to check the incidence of neck pain among office workers for one year and the physical, psychological or personal factors that cause this problem. The study concluded that all these factors were the risk factors for neck pain in office workers. Also the change in ergonomics of work setting improves the job environment(9).

Julia M. Hush and colleagues conducted a 1 year longitudinal studies in 2009 on individual, physical and psychological causative factors for neck pain in Australian office workers. The purpose of this study was to observe the presence of possible risk factors that caused neck pain in office workers. The result of the study showed that neck pain is a common problem in those working in offices and the factors that cause pain can be modified to reduce its occurrence(10).

L Smith et al conducted a cross sectional study in 2009 on association of computer usage with neck pain and headaches. The objective of the study was to check the relation between computer usage and headaches and neck pain in school going children. The study results showed that girls were more susceptible to headaches mostly because of psychosocial reason. Also, computer usage for long duration appeared to be the cause of neck pain in students. This showed the need for establishing proper posture and good work environment(11).

In 2010, Mark Rafferty conducted a pilot randomized crossover trial to check the relation of neck tie with cerebrovascular reactivity. The purpose of the study was to check if the necktie interferes with the intracranial pressure and increases it by harmfully changing the cerebrovascular reactivity. The results showed that the cerebrovascular function was impaired by using the pseudo tie. But the breath hold index was somehow normal. However the condition might be different in patients who have vascular symptoms and this needs to be confirmed(12)

METHODOLOGY

Comparative cross sectional study design was used. Convenient sampling technique was used. Data was collected from different commercial and micro-finance banks as well as from HR departments, various departments of news channels in Lahore. The duration of study was six months from August 2019 to January 2020.Sample size was calculated through Raosoft software. Computer user with tie-wearing, Computer user without tie-wearing and Age between 25-40 Years with Daily computer usage of 8

hours or more with having same nature of job from last 5 years were included in the study. All computer users having defined musculoskeletal problems ,Any neurological condition particularly involving the cervical spine ,Clinically defined systemic diseases ,Any arthritic condition ,History of upper limb fracture or trauma and those on Medications like anti-depressants, tranquilizers etc. Were excluded from the study. Data was collected about daily computer usage, tie wearing duration, neck range of motion and about neck pain intensity. Data was collected through standardized questionnaires about neck pain. Neck ranges were measured through using Goniometer. Questionnaires used were neck disability index (NDI) and numeric pain rating scale (NPRS). The questionnaires were distributed as hand-outs. The collected data was analyzed through SPSS v.21. For descriptive statistics frequency tables, histogram, pie chart and bar chart were constructed. Chi-square test was applied for data analysis and Pearson's correlation co-efficient was calculated. Quantitative data was analyzed by using standard deviation, mean, minimum and maximum range through T-test and Independent sample test.

RESULTS

Group		Maximum	Minimum	Mean	Std. Deviation
Tie Wearing	Neck flexion ROM	30	90	55.50	16.430
	Neck extension ROM	35	70	58.20	10.163
	Right lateral flexion ROM	35	60	41.10	4.414
	Left lateral flexion ROM	35	65	41.25	4.402
	Right rotation ROM	40	90	63.75	15.298
	Left rotation ROM	40	90	64.60	14.748
	Valid N (list wise)				
Non-tie Wearing	Neck flexion ROM	20	70	48.07	8.970
	Neck extension ROM	30	90	53.37	14.054
	Right lateral flexion ROM	40	90	67.35	11.622
	Left lateral flexion ROM	30	90	67.02	12.134
	Right rotation ROM	20	60	34.00	8.348
	Left rotation ROM	20	50	35.22	6.450
	Valid N (list wise)				

The above mentioned table showed mean and standard deviation of two groups with all ranges of neck.

Table 2: NDI Statistics

Group		N	Minimum	Maximum	Mean	Std. Deviation
Tie Wearing	Total score of NDI	100	1	50	10.76	11.273
	Valid N (list wise)					
Non-tie Wearing	Total score of NDI	100	1	9	1.82	1.410
	Valid N (list wise)					

The above mentioned table showed mean of 10.76 in tie wearing and 1.82 in non-tie wearing group while standard deviation is 11.273 in tie wearing group and 1.410 in non-tie wearing group.

DISCUSSION

In this study, association of neck pain in tie wearing and non-tie wearing computer users was evaluated.

This study was especially conducted to work on the hypothesis that tie wearing computer users have greater association with neck pain as compared to non-tie wearing computer users who worked for 8 hours or more daily on the computers and the age limit was from 25-40.The data was collected and analysis was done. Analyzing the tables, charts and graphs, Graph 1 shows the mean age of participants i.e. 31.85 and standard deviation i.e. 5.404.Graph 2 shows the mean age of tie wearing participants i.e. 31.86 and SD 4.411

Previous researches show that computer users have a high incidence of shoulder, neck and back pain that was thought to be associated with the poor ergonomics(8). Computer usage for long duration appeared to be the cause of neck pain in students. This showed the need for establishing proper posture and good work environment(11). In current study significant p-value can be seen. P-value is less than 0.05 which means that alternate hypothesis is accepted. Table 7 is showing the values of mean and standard deviation calculated for pain at present, usual pain level, best pain level and worst pain level during the last week. Graph of NPRS shows the different intensity of pain in percentage of population in tie wearing and non-tie wearing computer users separately. No pain was reported 46.76% of non-tie wearing population and 53.24% in non-tie wearing. Very mild pain was reported in -----% of tie wearing and ----% of non-tie wearing.50% of both the groups showed moderate and very severe level of pain.75% & 25% of tie wearing & non tie wearing respectively showed fairly severe level of pain and 100% of tie wearing whereas 0% of non-tie wearing population showed worst level of pain.

Work related neck pain is related to long working hours on computer; it is not known that if being on computer is the sole reason of pain. However there are several factors that might be associated with neck pain which include personal, psychological, social and physical causes(13). Strong association between long hours of keeping the head in flexion and neck pain was found (OR 2.61) Also the change in ergonomics of work setting improves the job environment (9).

One study suggested that musculoskeletal problems prevail more in the workers who already had spine related pain. Other than that, pain in some specific body parts may be dependent on gender and age for example females were more prone to develop pain in neck, shoulder upper back, ankle and feet. Female office workers showed greater tendency to develop musculoskeletal problems ($p<0.05$) and younger office workers were more prone to the upper back pain than older ones ($p<0.05$). The need to reduce such occurrences by altering the work conditions or environment is required(14). Computer usage for long duration appeared to be the cause of neck pain in students. This showed the need for establishing proper posture and good work environment(11). One of the study was to check if the necktie interferes with the intracranial pressure and increases it by harmfully changing the cerebrovascular reactivity and it turned out that the cerebrovascular function was impaired by using the pseudo tie ($p<0.001$).

Studies showed that women are more susceptible of developing neck pain. It was noted that neck pain was more common in developed countries rather than underdeveloped countries and in modern cities rather than villages. Other contributing factors can be external and internal that affect the occurrence and duration of neck pain. The overall prevalence of neck pain in the general population ranges between 0.4% and 86.8% (mean: 23.1%); point prevalence ranges from 0.4% to 41.5% (mean: 14.4%); and 1 year prevalence ranges from 4.8% to 79.5% (mean: 25.8%) (1). Female office workers are more

susceptible to develop the symptoms and also if there is the history of neck problem(15). Long working hours and breaks in between have influence on neck pain. Those who work for more than 5 hours a day are more prone to severe neck pain. In this study there was a strong association between long working hours on computer and pain in neck (p=0.001)(16).

One study showed that neck pain disability and factors differ in males and females, the type of job, stress, tobacco use, ergonomics and race. The results concluded that the neck pain is highly associated with the way the workers perform their tasks in their workplace. Neck pain is a commonly occurring problem that has some factors that can be modified and that cannot be modified. Age, sex and genes are the factors that can't be modified and are known to be the risk factors. Others that can be modified are smoking and mental health. Disc degeneration isn't a risk factor for neck pain (17).

In one study, Upper cervical flexion and the ratio between upper and total cervical flexion was markedly reduced after one hour of computer usage (18). In another study, it was seen that neck pain was associated with forward head position and kyphosis but not with rounded shoulders(19).There's a positive relation between time and work that determines the possibility of neck pain in occupational class(20). People who already had mood and pain inhibition problems are highly susceptible to developing chronic neck pain when muscle are fatigued by the pain stimuli. Chronic neck pain had a relation with depression (p< 0.03)and cervical endurance (p<0.001)(21). People who had neck pain also reported that their anxiety and depression had a role in limiting their functionality and aggravating their symptoms. Intensity of neck pain had a significant relation with anxiety (p<0.05)and disability had a significant relation with anxiety and depression(p<0.05)(22).

Current study was based on finding if tie wearing computer users have a greater association with neck pain as compared to non-tie wearing computer users .This study showed a significant association of neck pain in tie wearing computer users. P-value is less than 0.05 which means that alternate hypothesis is accepted.

CONCLUSION

From this study it was concluded that there is a strong association of neck pain among computer users with tie-wearing as compared to those computer users who don't wear tie but belong to the same age group as well as having the same nature of job.

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