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Original Article

Prevalence and Occupational Risk Factors of Neck Pain among Desk-Based Office Workers

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Abstract

Background

Neck pain is a common work-related musculoskeletal disorder, especially for individuals with sedentary office jobs involving repetitive tasks. Poor posture and ergonomic issues increase stress on the cervical spine and muscles, impacting physical health, raising absenteeism, and reducing productivity. This study aims to investigate the prevalence, risk factors and consequences of neck pain in office workers.

Materials and Methods

A cross-sectional survey of 179 participants from two organizations in Biratnagar, Nepal (98 from NMCTH and 81 from NTC) used self-administered questionnaires and convenient sampling to collect data.


Results

Working more than 8 hours per day significantly increased the prevalence of neck pain to 78.9%, compared to 61.5% in those working 8 hours or less ($p=0.030$). Prolonged posture was reported by 74.5% of participants with neck pain, which significantly disrupted daily activities (100%), household chores (94.7%), and outdoor activities (100%) ($p<0.001$).

Conclusion

Neck pain is very common among office workers in Biratnagar, mainly due to long work hours, heavy computer use, and poor posture. These factors seriously affect daily life and work performance. Improving workplace ergonomics and encouraging regular movement are key to reducing this problem.

Keywords: Neck pain, Musculoskeletal Diseases, Occupational Exposure

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Introduction

Neck pain is a common musculoskeletal problem causing discomfort from the base of the skull to the upper back and shoulders, impacting physical health, social interactions, and mental well-being [1-3]. Office workers who use computers for more than five hours daily are particularly at risk due to poor posture and repetitive movements that strain neck muscles. Globally, the prevalence of neck pain among office workers varies widely, from around 12% in Nepal to over 70% in Pakistan, with significant rates also reported in Western countries, Brazil, and Hong Kong [2-6].

Both occupation and gender influence neck pain, with women often experiencing more severe symptoms. The pain arises from a combination of physical factors such as prolonged static postures and repetitive neck movements, along with psychological factors like stress, job dissatisfaction, and anxiety [7-9]. Individual factors including age, body mass index, smoking, and physical activity levels also contribute. Despite its impact on daily life and productivity, little is known about the specific causes and effects of neck pain among Nepalese office workers. Evidence suggests that reducing computer use, taking frequent breaks, and engaging in regular exercise can help alleviate symptoms [7-10].

This study aims to determine the prevalence of neck pain among desk-based office workers in Nepal, identify occupational risk factors, and assess its effects on health and daily functioning. The findings will help develop targeted strategies to improve workplace health and productivity.

Materials and Methods

This descriptive cross-sectional study was conducted between September 2022 and March 2023 at two major organizations in Biratnagar, Nepal: Nobel Medical College Teaching Hospital (NMCTH) and Nepal Telecom Corporation (NTC). The aim was to assess the prevalence and occupational risk factors of neck pain among desk-based office workers. Ethical clearance for the study was granted by the Institutional Review Committee of Nobel Medical College Teaching Hospital (Reference No: IRC-NMCTH 715/2022). Prior to participation, all respondents were provided with detailed information about the study, and written informed consent was obtained. Participants were eligible if they had been employed in their respective offices for at least one year and agreed to take part voluntarily.

Individuals with a history of neck trauma, spinal deformities, previous neck surgery, multiple scoliosis, or inflammatory conditions were excluded to minimize potential confounding variables. Sample size was calculated by the formula

$$n = Z^2 P (1 - P) / d^2 \text{ Where,}$$

Z= 1.96 (for 95% confidence interval)

P= 12.3% [expected prevalence of neck pain, i.e., 12.3% [6].]

D= 95% (margin of error)

$$n = [1.962 \times 0.12 \times (1 - 0.12)] / 0.052$$

$$n = 162$$

To ensure sufficient power and account for possible non-responses, the final sample included 179 participants. A total of 179 participants were included, comprising 98 employees from NMCTH and 81 from NTC. A convenience sampling method was used to recruit participants due to ease of access and practical feasibility. Data were collected using a self-developed, structured questionnaire covering demographic details, the prevalence of neck pain, physical risk factors related to work, and its consequences on daily life. The tool was reviewed by a panel of physiotherapy experts, pretested among 16 office workers for clarity and relevance, and refined accordingly. Its internal consistency was verified using Cronbach's alpha, yielding a reliability score of 0.7. Data were entered into SPSS version 25 for analysis. Inferential analysis involved bivariate analysis using the Chi-square test to assess associations between neck pain and occupational or demographic factors. Variables showing significance in bivariate analysis ($p < 0.2$) were further analyzed using binary logistic regression to identify independent predictors of neck pain. The results were reported as β coefficients, p-values, adjusted odds ratios (AOR), and 95% confidence intervals.

Results

The participants had an average age of 37.56 years with a standard deviation of 9.8 years. More than half that is 53.1% of the respondents were under the age of 37 years. More of the population ought to be added because of gender, whereby a sample size of 60.5% male was, and the females making 39.5% of the sample. Most of the participants were from NMCTH in which 52.5% of the sample constituted, whereas 47.5% were from Nepal Telecom. As for health problems prevalence of neck pain, 3/4th proportion of the population were suffering from neck pain, and



this appeared to be a common condition for this category.

Table 1: Bivariate Analysis of Factors Associated with Neck Pain Among Office Workers

Table 2: Multivariate Logistic Regression Analysis of

	Neck pain		P-value
	Yes	No	
Age			
Less than equal to 37 years	67 (77.9%)	19 (22.1%)	0.317
More than equal to 38 years	54 (71.1%)	22 (28.9%)	
Gender			
Male	71 (72.4%)	27 (27.6%)	0.417
Female	50 (78.1%)	14 (21.9%)	
Organization			
NMCTH	65(76.5%)	20(23.5%)	0.299
Nepal telecom	20(23.5%)	21(27.3%)	
Do you work more than 8 hours per day?			
Yes	97(78.9%)	26(21.1%)	0.030*
No	24(61.5%)	15(38.5%)	
Work in same posture for prolonged time			
Yes	73(74.5%)	25(25.5%)	0.942
No	48(75%)	16(25.0%)	
Are you a computer user?			
Yes	112(80%)	28(20%)	<0.001*
No	9(40.9%)	13(59.1%)	
use computer for more than 5 hours			
Yes	99(81.8%)	22(18.2%)	<0.001*
No	22(53.7%)	19(46.3%)	
work in a bend or twisted posture for prolonged time			
Yes	72(80.9%)	17(19.1%)	0.045*
No	49(67.1%)	24(32.9%)	
pain aggravates during forward neck bending for prolonged time			
Yes	88(85.4%)	15(14.6%)	<0.001*
No	33(55.9%)	26(44.1%)	
often do various short periods of movement with neck			
Yes	70(71.4%)	28(28.6)	0.237
No	51(79.7%)	13(20.3%)	
sleep being disturbed by your neck pain			
Yes	45(93.8%)	3(6.3%)	<0.001*
No	76(66.7%)	38(33.3%)	
daily activities being disturbed by your neck pain			
Yes	54(100%)	67(62%)	N/A
No	0	41(38%)	
social activities being disturbed by your neck pain			
Yes	24(100%)	0	N/A
No	97(70.3%)	41(29.7%)	
household chores being disturbed by your neck pain			
Yes	54(94.7%)	3(5.3%)	<0.001*
No	67(63.8%)	38(36.2%)	
outdoor activities being disturbed by your neck pain			
Yes	36(100%)	0	N/A
No	85(67.5%)	41(32.5%)	

Factors Associated with Neck Pain Among Office Workers

Discussion

Characteristics	â Coef	P-Value	AOR (95% CI)
Do you work more than 8 hours per day?	0.449	0.353	1.567 (0.607–4.048)
Are you a computer user?	0.692	0.338	1.997 (0.485–8.224)
Do you use a computer for more than 5 hours?	0.715	0.194	2.044 (0.695–6.010)
Do your pain aggravates during forward neck bending?	0.887	0.061	2.428 (0.960–6.139)
Is your sleep being disturbed by your neck pain?	1.158	0.112	3.185 (0.764–13.271)
Is your household chores being disturbed by your neck pain?	1.37	0.049	3.935 (1.004–15.422)

The research study revealed that 74.7% of respondents had neck pain. The ergonomic characteristics of the workplace and the sorts of activities that require individuals to hold a certain position for extended periods may influence this variation in prevalence. 53.1% of the participants were under 37 years old, with an average age of 37.56 (SD = 9.8). In total, there were 39.5% females and 60.5% males in the sample. NMCTH comprised the majority of participants (52.5%), with Nepal Telecom accounting for the remaining 47.5%. Three-quarters of the participants stated having neck pain overall, indicating its prevalence in this group of individuals.

Neck pain may be triggered by physical causes such as extensive computer use and maintaining poor posture for extended periods. Age and gender had no significant association with neck pain, according to this study. The study's findings, however, indicated a statistically significant correlation between working hours and neck pain, in contrast to earlier studies that found no significant differences [1]. The incidence of neck pain was higher among those who worked more than eight hours a day (78.9%) than among those who worked eight or less (61.5%)

($p=0.030$), indicating that longer workdays may make the condition worse. This could be caused by inadequate ergonomic variations, like improperly made furniture, a poorly positioned computer, and a lack of knowledge about optimum posture when working.

This study included both bivariate and multivariate analysis. The bivariate study evaluated the association between the prevalence of neck discomfort and physical characteristics (e.g., age, gender, posture, work habits, and activity disruptions). Significant correlations were found between the period spent working, computer



use, posture, neck bending pain, and disturbances to daily routines, sleep, housework, and outdoor activities. Working more than eight hours a day, via a computer for more than five hours, working in a twisted or bent posture for extended periods, experiencing pain when bending the neck forward, and having neck pain that interfered with sleep or household chores were the variables that demonstrated significant associations in the bivariate analysis. Following the bivariate analysis, all variables with a p-value <0.2 were added to the binary logistic regression analysis.

78.9% of individuals reported working long hours, according to the survey 80% of the respondents said they used computers, and of those, a sizable percentage (81.8%) reported using computers for more than five hours per day, making them active computer users. This suggests that the study population had a high prevalence of prolonged screen time. Previous studies have shown similar findings, with people who worked long hours and were frequent computer users working over 40 hours per week developing symptomatic neck pain [11].

According to the study, 80.9% of participants assumed twisted or bent postures when working, while 74.5% of participants reported staying in the same position for extended periods. Consequently, 85.4% of participants reported feeling more discomfort, which they attributed to these poor postures. Further highlighting the role of these factors in contributing to chronic neck and shoulder pain (NSP) in hospital settings, these findings are consistent with a prior study conducted among public hospital workers in China that found similar ergonomic factors, such as prolonged neck bending and twisting, as well as computer-related issues, such as excessive screen time and poorly positioned keyboards [12].

Brief periods of movement are reported by a noteworthy 71.4% of participants, highlighting the effect of inadequate ergonomic procedures on musculoskeletal pain. Lack of knowledge about good posture, the value of taking breaks during work hours and the contributions of strength training, muscular activity, eccentric training, and biofeedback are some of the main causes of neck issues. Since prior research has shown that these factors are useful in reducing certain disorders, awareness must be raised about them [13-15].

The study's significant impact was highlighted by the finding that 93.8% of participants had sleep disruptions as a result of discomfort. Their

outdoor activities, social contacts, and work were all greatly impacted by neck pain. Additionally, 94.7% of respondents said they had difficulty doing domestic tasks, highlighting the negative impact that discomfort has on day-to-day functioning and general quality of life. The detrimental effects of chronic discomfort on a person's quality of life and productivity at work have also been highlighted in earlier studies on risk factors for musculoskeletal illnesses among office and remote workers [16,17].

Conclusion

Neck pain is a common problem among office workers in Biratnagar, Nepal, with many experiencing discomfort due to long working hours, extensive computer use, and poor posture. This pain not only affects their health but also disrupts daily activities, sleep and household chores, impacting their overall quality of life and work performance. While factors like age and gender did not show a strong link to neck pain in this study, work habits and ergonomic issues clearly play a major role. These findings highlight the importance of improving workplace ergonomics and encouraging regular breaks and movement to help reduce neck pain. Future studies with larger and more diverse groups are needed to better understand all the factors involved and to develop effective prevention strategies tailored to the needs of office workers in eastern Nepal.

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Conflict of interest: None

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