



PREVALENCE AND ASSOCIATED FACTORS OF NECK PAIN AMONG OFFICE WORKERS IN DHAKA CITY

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Abstract

Background: Neck pain is a prevalent musculoskeletal complaint among office workers, contributing significantly to disability and reduced productivity. Despite its global burden, limited data are available regarding its prevalence and associated factors in Bangladesh.

Objective: To determine the prevalence of neck pain and identify associated occupational, ergonomic, and lifestyle-related risk factors among office workers in Dhaka city.

Methods: A cross-sectional study was conducted from July 2019 to June 2020 at the Department of Physical Medicine and Rehabilitation, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. A total of 280 office workers were recruited using a convenience sampling method. Data were collected through face-to-face interviews using a structured questionnaire and the Nordic Musculoskeletal Questionnaire (NMQ). Bivariate and multivariable logistic regression analyses were performed to identify independent predictors of neck pain.

Results: The 12-month prevalence of neck pain among participants was 32.5%. Multivariable analysis revealed that female gender (AOR = 1.84; 95% CI: 1.07–3.16), working ≥ 8 hours/day (AOR = 1.96; 95% CI: 1.06–3.63), poor ergonomic conditions (AOR = 2.43; 95% CI: 1.38–4.28), and physical inactivity (AOR = 1.71; 95% CI: 1.01–2.91) were independently associated with neck pain. No significant associations were observed with BMI or smoking status. **Conclusion:** Neck pain poses a considerable occupational health concern among office workers in Dhaka. Interventions targeting ergonomic improvements, reduction of prolonged working hours, promotion

of physical activity, and gender-sensitive workplace modifications are essential for prevention and management. Further longitudinal studies are recommended to evaluate the long-term impact of these strategies.

Keywords: Neck pain, office workers, ergonomics, physical activity, musculoskeletal disorders, Bangladesh

INTRODUCTION

Neck pain is a common musculoskeletal disorder and a leading cause of disability worldwide. According to the Global Burden of Disease Study 2017, analyzed by Mansournia et al., neck pain was found to be a major contributor to global disability, with an estimated age-standardized point prevalence of 3.5% worldwide, accounting for more than 223 million cases in 2017 alone, making it one of the most significant contributors to years lived with disability (YLDs) [1,2].

Office workers are particularly susceptible to neck pain due to prolonged sitting, repetitive computer tasks, awkward posture, and poor ergonomics [3,4]. Poor ergonomic practices, prolonged sitting, and physical inactivity significantly increased the risk of musculoskeletal disorders, including neck pain, among office workers, while proper workstation setup and regular physical activity were associated with a reduced risk [5]. In a study from New Zealand, 51% of office workers reported at least one episode of neck pain within the past year [6]. High prevalence of neck pain among office employees and identified prolonged computer use, poor posture, stress, and lack of physical activity as major contributing factors, with significant impacts on daily functioning and work productivity [7].

Several occupational and lifestyle-related factors contribute to neck pain. Extended working hours, sedentary behavior, improper workstation design, lack of physical activity, stress, and smoking have been identified as significant risk factors [4,8]. Psychosocial stressors and job dissatisfaction also play a critical role in the development of work-related musculoskeletal disorders, including neck pain [9]. A meta-analysis conducted among office workers identified that factors such as positioning the keyboard too close to the body, limited variation in work tasks, high self-perceived muscular tension, and low satisfaction with the workplace environment were significantly associated with an increased risk of developing non-specific neck pain, with relative risks ranging from 1.3 to 2.8 [10]. Despite the growing body of literature, there remains limited data from Bangladesh addressing the burden of neck pain specifically among urban office workers. Understanding the prevalence and associated risk factors in this population is crucial for developing preventive strategies and promoting occupational health.

Therefore, the present study aimed to determine the 12-month prevalence of neck pain among office workers attending a tertiary care hospital in Dhaka and to identify associated occupational, ergonomic, and lifestyle-related factors.

MATERIALS AND METHODS

Study Design and Setting

This cross-sectional study was conducted at the Department of Physical Medicine and Rehabilitation, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, a tertiary care hospital located in Dhaka city.

Study Population

The study population included adult office workers from various public and private institutions in Dhaka city who sought treatment at the Department of Physical Medicine and Rehabilitation, Bangabandhu Sheikh Mujib Medical University (BSMMU), between July 2019 and June 2020. Eligible participants were those who had been engaged in office-based work for at least 6 months prior to the interview.

Inclusion Criteria

- Adults aged 20 years and above
- Currently or previously employed in office-based occupations for at least 6 months
- Sought treatment at the Department of Physical Medicine and Rehabilitation during the study period
- Provided informed written consent to participate

Exclusion Criteria

- History of traumatic neck injury or cervical spine surgery
- Known cervical spine disorders (e.g., cervical spondylosis, disc herniation) diagnosed prior to starting office work
- Pregnant women
- Individuals engaged primarily in physically demanding work or field-based tasks

Sample Size and Sampling Technique

The required sample size was calculated using the single population proportion formula, assuming a prevalence of 28.3% based on a previous study conducted among desk-job workers in a tertiary care hospital in India [11]. At a 95% confidence level and a 5% margin of error, the minimum sample size was estimated to be 313 participants. To account for a potential 10% non-response rate, the target sample size was adjusted to 345 participants.

A convenience sampling method was employed to recruit adult office workers (aged ≥ 20 years) attending the Department of Physical Medicine and Rehabilitation at Bangladesh Medical University between July 2019 and June 2020. Ultimately, data were collected from 280 participants who met the inclusion criteria and provided complete responses. The reduction in sample size was due to time constraints and participant availability during the data collection period.

Data Collection Tools and Procedure

Data were collected using a structured, pre-tested questionnaire administered through face-to-face interviews. The questionnaire included:

- Socio-demographic characteristics (age, sex, BMI, education, etc.)
- Work-related factors (working hours, sitting posture, ergonomic conditions, duration of employment)
- Lifestyle factors (physical activity, smoking, screen time)
- Assessment of neck pain using the Nordic Musculoskeletal Questionnaire (NMQ)

The presence of neck pain was defined as self-reported pain, discomfort, or stiffness in the neck region lasting for at least one day during the last 12 months.

Data Analysis

Data were entered and analyzed using. Descriptive statistics were used to summarize demographic and occupational characteristics. The prevalence of neck pain was calculated as a proportion with 95% confidence intervals. Bivariate analyses (Chi-square test or t-test) were performed to assess associations between neck pain and potential risk factors. Variables with $p < 0.05$ in bivariate analysis were included in multivariable logistic regression to identify independent predictors of neck pain. A p -value < 0.05 was considered statistically significant.

RESULTS**Socio-demographic and Occupational Characteristics of Respondents**

A total of 280 office workers participated in the study. The mean age of participants was 36.2 ± 8.9 years. Among them, 160 (57.1%) were female, and 120 (42.9%) were male. The majority (68.6%) had a university-level education, and the mean Body Mass Index (BMI) was 24.7 ± 3.4 kg/m². Most

respondents (72.5%) reported working ≥ 8 hours per day, and 65% had been in their current job for more than 5 years.

Table 1: Socio-demographic and Work-related Characteristics of Participants (n=280)

Variable	Frequency (%) / Mean $\pm$ SD
Age (years)	36.2 $\pm$ 8.9
Gender	
- Male	120 (42.9%)
- Female	160 (57.1%)
Education Level	
- Secondary	45 (16.1%)
- Higher Secondary	43 (15.4%)
- Graduate and above	192 (68.6%)
Body Mass Index (BMI)	24.7 $\pm$ 3.4
Working hours/day	
- <8 hours	77 (27.5%)
- ≥ 8 hours	203 (72.5%)
Duration of Employment	
- <5 years	98 (35.0%)
- ≥ 5 years	182 (65.0%)
Physical Activity (≥ 3 times/week)	93 (33.2%)
Smoking Habit	
- Yes	64 (22.9%)
- No	216 (77.1%)
Poor Ergonomic Conditions	184 (65.7%)

Prevalence and Impact of Neck Pain (Assessed by NMQ)

Based on the Nordic Musculoskeletal Questionnaire, the 12-month prevalence of self-reported neck pain among office workers was 32.5% (n = 91; 95% CI: 27.1%–38.2%). Among those reporting neck pain: 68 (74.7%) experienced neck pain in the last 7 days. 39 (42.9%) reported that neck pain had limited their daily activities at some point during the last 12 months.

Table 2: Distribution of Neck Pain According to NMQ (n = 280)

Neck Pain Component	Frequency (%)
Neck pain during the last 12 months	91 (32.5%)
Neck pain during the last 7 days (of those with neck pain)	68 (74.7%)
Neck pain that limited daily activity (last 12 months)	39 (13.9%)
No neck pain reported in the last 12 months	189 (67.5%)

Bivariate Analysis of Factors Associated with Neck Pain

Neck pain was significantly more prevalent among females (p = 0.014), those with longer working hours (p = 0.011), poor ergonomic conditions (p < 0.001), and lack of physical activity (p = 0.036).

Table 3: Bivariate Analysis of Factors Associated with Neck Pain (n=280)

Variable	Neck Pain Present (n=91)	No Neck Pain (n=189)	p-value
Age (Mean $\pm$ SD)	37.1 $\pm$ 8.6	35.7 $\pm$ 9.1	0.173
Gender			
- Male	30 (33.0%)	90 (47.6%)	0.014*
- Female	61 (67.0%)	99 (52.4%)	
Working ≥ 8 hrs/day	74 (81.3%)	129 (68.3%)	0.011*
Poor Ergonomic Setup	72 (79.1%)	112 (59.3%)	0.001*
Physical Activity (No)	69 (75.8%)	118 (62.4%)	0.036*
Smoking	25 (27.5%)	39 (20.6%)	0.198
BMI ≥ 25	42 (46.2%)	71 (37.6%)	0.147

*Statistically significant at p<0.05

Multivariable Logistic Regression Analysis

After adjusting for confounding factors, female gender, working ≥ 8 hours per day, poor ergonomic conditions, and lack of physical activity remained significant predictors of neck pain.

Table 3: Multivariable Logistic Regression for Independent Predictors of Neck Pain

Variable	Adjusted Odds Ratio (AOR)	95% CI	p-value
Female gender	1.84	1.07 – 3.16	0.027*
Working ≥ 8 hours/day	1.96	1.06 – 3.63	0.032*
Poor ergonomic setup	2.43	1.38 – 4.28	0.002*
Physical inactivity	1.71	1.01 – 2.91	0.045*

*Statistically significant at $p < 0.05$

DISCUSSION

In the present study, the 12-month prevalence of neck pain among office workers was found to be 32.5%. This finding aligns with previous international studies reporting a wide range of neck pain prevalence among working populations. Carragee et al. (2008) highlighted that neck pain is a common complaint among workers globally, with prevalence estimates varying from 20% to over 60%, depending on occupational and psychosocial factors [12]. Similarly, Guez et al. (2002) documented a prevalence of 30% to 50% in general populations, with even higher rates among individuals engaged in sedentary or repetitive tasks [13]. These variations may be influenced by differing workplace ergonomics, job demands, and awareness or reporting behaviors across settings. Consistent with several previous studies, female participants in this study were significantly more likely to report neck pain than males (AOR = 1.84). This aligns with a longitudinal study of Australian office workers, which found that being female was associated with a threefold increased risk of developing neck pain (HR = 3.07; 95% CI: 1.18–7.99) [14]. Moreover, Johnston's work highlighted that female office workers consistently report higher prevalence of neck and upper shoulder symptoms, along with greater functional impact and healthcare utilization, compared to their male counterparts [15]. These gender differences may reflect not only biological and musculoskeletal variances but also psychosocial and ergonomic factors influencing pain perception and coping strategies.

Participants who worked ≥ 8 hours per day had nearly twice the odds of developing neck pain (AOR = 1.96). This finding is consistent with evidence that prolonged sitting at work is a significant predictor of neck pain. Janwantanakul et al. found that office workers who spent extended periods in static seated postures and repetitive computer use had significantly higher prevalence of neck and upper back symptoms—neck complaints were reported by about 42% of respondents in that cohort [16]. Such long hours with minimal postural variation increase cervical muscle fatigue and mechanical strain, contributing to chronic discomfort [16,17].

Poor ergonomic conditions showed the strongest association with neck pain in our study (AOR = 2.43). Office workers with suboptimal workstation setups such as non-adjustable chairs, poorly positioned monitors, and lack of forearm support were significantly more likely to report musculoskeletal discomfort and poor ergonomic conditions were strongly linked to neck and upper-limb pain among office workers in Japan [18]. Similarly, Van Vledder and Louw (2015) demonstrated that ergonomic adjustments to chair and monitor height reduced upper-quadrant pain and improved sitting comfort in South African office employees [19].

Further supporting these findings, Johnston et al. (2014) conducted a study that showed that workplace interventions combining ergonomic improvements and neck-specific exercises led to greater reductions in neck pain intensity compared to health promotion alone [20]. Additionally, a systematic review by Chen et al. (2018) confirmed that ergonomic interventions especially when paired with exercise are effective strategies to reduce neck pain in office-based workers [9].

Physical inactivity was identified as an independent risk factor for neck pain in our study (AOR = 1.71); participants who did not engage in physical activity at least three times per week were more likely to suffer from neck pain. This finding is consistent with Scarabottolo et al. (2017),

who reported a higher prevalence of neck and back pain among physically inactive adolescents, highlighting the protective role of regular physical activity in maintaining spinal health and preventing musculoskeletal pain [21]. Additionally, this finding aligns with the population-based study by Bjorck-van Dijken et al. (2008), which demonstrated that individuals with low levels of physical activity had a higher prevalence of low back pain [22].

Unlike prior reports where BMI and smoking were associated with neck pain risk, neither factor reached statistical significance in our dataset. This discrepancy may stem from population characteristics, residual confounding, or limited power to detect these associations in our sample consistent with mixed findings from broader epidemiological reviews where lifestyle factors showed inconsistent associations once occupational exposures were controlled [23].

The findings of this study emphasize the multifactorial nature of neck pain among office workers, highlighting the need for comprehensive workplace health promotion strategies. Gender-sensitive interventions, ergonomic workstation modifications, reduced sedentary behavior, and encouragement of regular physical activity may serve as effective preventive approaches.

CONCLUSION

This study highlights a substantial burden of neck pain among office workers, with a 12-month prevalence of 32.5%. Key independent risk factors identified include female gender, prolonged working hours (≥ 8 hours/day), poor ergonomic conditions, and physical inactivity. These findings underscore the multifactorial etiology of neck pain in sedentary work environments. Addressing ergonomic deficiencies, promoting regular physical activity, and implementing gender-sensitive workplace interventions could significantly reduce the prevalence and impact of neck pain. Future research should explore longitudinal patterns and evaluate the effectiveness of multi-component intervention strategies to further inform occupational health policies and practices.

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