

*Original Article*

# Prevalence of Neck Pain and Functional Disability and Its Association With Working Hours Among Aestheticians

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## ABSTRACT

**Background:** Neck pain is a common occupational musculoskeletal problem among aestheticians because their work frequently involves sustained neck flexion, forward head posture, repetitive upper-limb activity, prolonged static positioning, and extended working hours. These exposures may contribute not only to pain but also to functional limitations affecting daily and professional activities. **Objective:** To determine the prevalence of neck pain and functional disability among aestheticians and to examine their association with daily working hours. **Methods:** A cross-sectional observational study was conducted among 103 aestheticians working in aesthetic clinics, salons, and beauty-related settings in Lahore, Pakistan. Participants were recruited using non-probability convenience sampling. Demographic and occupational data were collected using a structured questionnaire. Neck pain severity was assessed using the Numerical Pain Rating Scale, and functional disability was assessed using the Neck Disability Index. Associations between working-hour categories and neck pain severity and functional disability were analyzed using Pearson's chi-square test in SPSS version 26, with  $p < 0.05$  considered statistically significant. **Results:** Moderate neck pain was reported by 61 participants (59.2%), severe neck pain by 32 (31.1%), and mild neck pain by 10 (9.7%). Functional disability was mild in 17 participants (16.5%), moderate in 32 (31.1%), severe in 32 (31.1%), and complete in 22 (21.4%). Daily working hours were significantly associated with neck pain severity,  $\chi^2(4) = 36.525$ ,  $p < 0.001$ , Cramer's  $V = 0.421$ , and functional disability,  $\chi^2(6) = 49.283$ ,  $p < 0.001$ , Cramer's  $V = 0.489$ . **Conclusion:** Neck pain and functional disability were highly prevalent among aestheticians, with longer working hours associated with greater pain severity and disability. Ergonomic education, posture correction, scheduled breaks, and workplace modifications may help reduce the occupational burden of neck-related symptoms. **Keywords:** Aestheticians, Neck Pain, Functional Disability, Working Hours, Neck Disability Index, Occupational Health, Musculoskeletal Disorders.

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## INTRODUCTION

Neck pain is a common work-related musculoskeletal complaint involving discomfort, pain, or functional limitation in the cervical region and surrounding soft tissues, including muscles, ligaments, tendons, intervertebral discs, and facet joints. It is increasingly recognized as an occupational health concern in professions that require prolonged static posture, repetitive upper-limb activity, sustained visual concentration, and extended working hours. Among working populations, neck pain may reduce functional capacity, impair daily activities, decrease work productivity, and contribute to long-term disability when early ergonomic and preventive measures are not implemented (1).

Aestheticians are a professional group exposed to several biomechanical and occupational risk factors for neck pain. Their routine work frequently requires forward head posture, sustained neck flexion, trunk inclination, repetitive hand movements, precision-based tasks, and prolonged seated or standing positions while providing facial treatments, hair removal, massage, makeup application, manicure, pedicure, and other beauty-related services (2). These occupational demands often require the head and neck to remain in non-neutral positions for extended periods, increasing static loading on the cervical extensor muscles and surrounding soft tissues. Inadequate seating, lack of back support, limited ergonomic awareness, insufficient rest breaks, and long daily working hours may further increase the cumulative mechanical burden on the cervical spine (3).

The biomechanical basis for neck pain in this population is clinically plausible. In neutral posture, the head is balanced over the shoulders; however, forward head flexion increases the external moment acting on the cervical spine and requires sustained low-level contraction of the posterior cervical and shoulder girdle muscles. Continuous contraction may reduce local blood flow, promote muscular fatigue, increase accumulation of metabolic by-products, and contribute to painful trigger points, stiffness, restricted cervical mobility, and disability. Over time, repetitive loading and sustained flexion may also affect ligaments, intervertebral discs, and facet joints, potentially contributing to persistent pain and functional limitation (4,5). Such mechanisms are particularly relevant to aestheticians because their work often combines prolonged visual focus with repeated fine motor activity in constrained postures.

Previous studies among occupational groups with comparable postural demands have reported substantial neck pain and disability. Research involving office workers, surgeons, dental professionals, hairdressers, beauticians, cosmetologists, and beauty salon workers has shown that neck pain is frequently associated with prolonged static posture, long working hours, poor ergonomics, repetitive movements, fatigue, and insufficient rest breaks (6,7). Studies among beauticians and cosmetologists have reported notable rates of musculoskeletal symptoms, with neck pain often identified as one of the most commonly affected regions (8,9). Evidence from related salon-based professions further suggests that musculoskeletal discomfort may be influenced by cumulative working exposure, years of professional experience, posture, task repetition, and workplace design (10,11).

Despite growing evidence on work-related musculoskeletal disorders among salon and beauty professionals, there remains limited context-specific evidence on the prevalence of neck pain and functional disability among aestheticians in Pakistan, particularly in relation to daily working hours. Existing studies often assess broader musculoskeletal symptoms across multiple body regions, include mixed occupational groups such as hairdressers, beauticians, and makeup artists, or focus primarily on ergonomic risk without directly examining the combined burden of pain severity and neck-related functional disability. This creates an important knowledge gap because identifying the relationship between working hours, pain severity, and disability may help guide workplace health policies, ergonomic education, posture correction strategies, and preventive interventions tailored to aestheticians.

Using a PICO framework, the population of interest in the present study is aestheticians working in aesthetic clinics and beauty-related settings; the exposure is longer daily working hours; the comparison is shorter working-hour categories; and the outcomes are neck pain severity and functional disability measured using standardized clinical tools. Understanding this relationship is important because working hours represent a potentially modifiable occupational factor. If longer working hours are associated with higher pain severity and greater disability, interventions such as scheduled microbreaks, ergonomic workstation modification, posture training, task rotation, and strengthening or stretching programs may reduce the occupational burden of neck pain in this group.

Therefore, this study aimed to determine the prevalence of neck pain and functional disability among aestheticians and to examine their association with daily working hours. The study was based on the

hypothesis that longer working hours are significantly associated with greater neck pain severity and higher levels of functional disability among aestheticians.

## MATERIALS AND METHODS

This cross-sectional observational study was conducted to determine the prevalence of neck pain and functional disability among aestheticians and to examine their association with daily working hours. The cross-sectional design was selected because it allowed simultaneous assessment of occupational exposure, pain severity, and neck-related disability within the target working population. The study was carried out among aestheticians working in selected aesthetic clinics, salons, and beauty-related service settings in Lahore, Pakistan. Participants were recruited using a non-probability convenience sampling technique from accessible professional settings where aesthetic and beauty-related procedures were routinely performed.

A total of 103 aestheticians were included in the study. Eligible participants were male and female aestheticians aged 25–45 years who were actively working in aesthetic or beauty-related practice and had regular occupational exposure to prolonged postures and service-related manual tasks. Participants were included if they had defined daily working-hour exposure within the occupational categories assessed in the study. Individuals were excluded if they had a history of cervical trauma, previous cervical spine surgery, current pregnancy, or a medical condition that could independently influence neck pain or functional disability. These eligibility criteria were applied to reduce the influence of non-occupational causes of neck symptoms and to maintain the focus on work-related neck pain and disability.

Participants were approached in their workplace settings and were informed about the purpose, procedures, voluntary nature, and confidentiality of the study before data collection. Written informed consent was obtained from eligible participants before participation. Data were collected using a structured questionnaire that included demographic and occupational information, including age, gender, body mass index category, years of working experience as an aesthetician, daily working hours, work breaks, and static working postures. Daily working hours were categorized into 6–7 hours, 8–9 hours, and 10–12 hours to assess the relationship between increasing occupational exposure and neck-related outcomes. Working experience was categorized into 1–5 years, 6–10 years, 11–15 years, and 16–20 years.

Neck pain severity was assessed using the Numerical Pain Rating Scale. The scale measured self-reported pain intensity on an 11-point scale ranging from 0 to 10, where 0 indicated no pain and 10 indicated the worst possible pain. Pain severity was categorized into mild, moderate, and severe pain for descriptive and inferential analysis. Functional disability related to neck pain was assessed using the Neck Disability Index, which evaluates the impact of neck symptoms on daily functional activities. Disability was categorized into no disability, mild disability, moderate disability, severe disability, and complete disability according to Neck Disability Index scoring categories (12,13). The primary outcome variables were neck pain severity and functional disability, while the main exposure variable was daily working hours. Demographic and occupational variables, including age, gender, BMI, and working experience, were collected to describe the study population and contextualize possible differences in occupational risk.

To reduce selection and information bias, the same structured data collection format was used for all participants. Eligibility criteria were applied consistently before enrollment, and participants were instructed to provide responses based on their usual work routine and current neck-related symptoms. Data collection was conducted using standardized instruments for pain and disability assessment. Completed questionnaires were reviewed for completeness before data entry, and responses were coded uniformly before statistical analysis. Participant confidentiality was maintained throughout the study by using anonymized data records and restricting access to collected information.

Data were analyzed using SPSS software version 26. Descriptive statistics were used to summarize demographic characteristics, occupational variables, neck pain severity, and functional disability. Frequencies and percentages were calculated for categorical variables, including age group, gender, BMI category, working experience, working-hour category, pain severity category, and disability category. The association between daily working hours and neck pain severity was assessed using Pearson's chi-square test.

The association between daily working hours and functional disability was also assessed using Pearson's chi-square test. A p-value of less than 0.05 was considered statistically significant. Linear-by-linear association values were used to examine whether increasing working-hour categories showed an ordered relationship with increasing pain severity and disability levels.

Ethical approval was obtained from the University of Management and Technology, Lahore. All participants were informed about the study objectives and procedures before enrollment, and informed consent was obtained before data collection.

Participation was voluntary, and participants were assured that their responses would remain confidential and would be used only for research purposes. Data integrity was maintained through standardized questionnaire administration, consistent coding of variables, completeness checking before analysis, and statistical processing using a defined analysis plan.

## RESULTS

A total of 103 aestheticians were included in the analysis. The demographic and occupational characteristics of the participants are presented in Table 1. Most participants were aged 25–30 years (44/103, 42.7%), followed by 31–35 years (33/103, 32.0%) and 36–40 years (26/103, 25.2%). No participant was recorded in the 41–45-year age group. The sample included 53 males (51.5%) and 50 females (48.5%). Most participants had normal BMI (75/103, 72.8%), while 17 participants (16.5%) were overweight and 11 participants (10.7%) were underweight. Regarding daily working hours, 68 participants (66.0%) worked 8–9 hours per day, 25 participants (24.3%) worked 10–12 hours per day, and 10 participants (9.7%) worked 6–7 hours per day. Working experience was most commonly 1–5 years (41/103, 39.8%), followed by 6–10 years (39/103, 37.9%) and 11–15 years (23/103, 22.3%).

*Table 1. Demographic and Occupational Characteristics of Participants (n = 103)*

Variable	Category	Frequency (n)	Percentage (%)
<b>Age group</b>	25–30 years	44	42.7
	31–35 years	33	32.0
	36–40 years	26	25.2
	41–45 years	0	0.0
<b>Gender</b>	Female	50	48.5
	Male	53	51.5
<b>BMI category</b>	Underweight	11	10.7
	Normal	75	72.8
	Overweight	17	16.5
	Obese	0	0.0
<b>Daily working hours</b>	6–7 hours	10	9.7
	8–9 hours	68	66.0
	10–12 hours	25	24.3
<b>Working experience</b>	1–5 years	41	39.8
	6–10 years	39	37.9
	11–15 years	23	22.3
	16–20 years	0	0.0

The distribution of neck pain severity and functional disability is shown in Table 2. Moderate neck pain was the most frequently reported category, affecting 61 participants (59.2%), followed by severe neck pain in 32 participants (31.1%) and mild neck pain in 10 participants (9.7%). Functional disability showed a substantial burden across the sample. Mild disability was present in 17 participants (16.5%), while moderate and severe disability were each reported by 32 participants (31.1% each). Complete disability was reported by 22 participants (21.4%). No participant was categorized as having no functional disability.

**Table 2. Distribution of Neck Pain Severity and Functional Disability Among Participants (n = 103)**

Outcome Variable	Category	Frequency (n)	Percentage (%)
Neck pain severity	Mild	10	9.7
	Moderate	61	59.2
	Severe	32	31.1
Functional disability	No disability	0	0.0
	Mild disability	17	16.5
	Moderate disability	32	31.1
	Severe disability	32	31.1
	Complete disability	22	21.4

The association between daily working hours and neck pain severity is presented in Table 3. Neck pain severity increased progressively with longer working hours. Among participants working 6–7 hours per day, 4 participants (40.0%) had mild pain, 6 participants (60.0%) had moderate pain, and none had severe pain. Among those working 8–9 hours per day, moderate pain was most common, affecting 48 participants (70.6%), while 14 participants (20.6%) had severe pain. In contrast, among participants working 10–12 hours per day, severe pain was the dominant category, affecting 18 participants (72.0%), while 7 participants (28.0%) had moderate pain and none had mild pain. Pearson's chi-square test showed a statistically significant association between working hours and neck pain severity,  $\chi^2(4) = 36.525$ ,  $p < 0.001$ . The effect size was moderate to strong, with Cramer's V = 0.421.

**Table 3. Association Between Daily Working Hours and Neck Pain Severity (n = 103)**

Neck Pain Severity	6–7 Hours, n (%)	8–9 Hours, n (%)	10–12 Hours, n (%)	Total, n (%)	$\chi^2$	df	p-value	Cramer's V
Mild	4 (40.0)	6 (8.8)	0 (0.0)	10 (9.7)	36.525	4	<0.001	0.421
Moderate	6 (60.0)	48 (70.6)	7 (28.0)	61 (59.2)				
Severe	0 (0.0)	14 (20.6)	18 (72.0)	32 (31.1)				
Total	10 (100.0)	68 (100.0)	25 (100.0)	103 (100.0)				

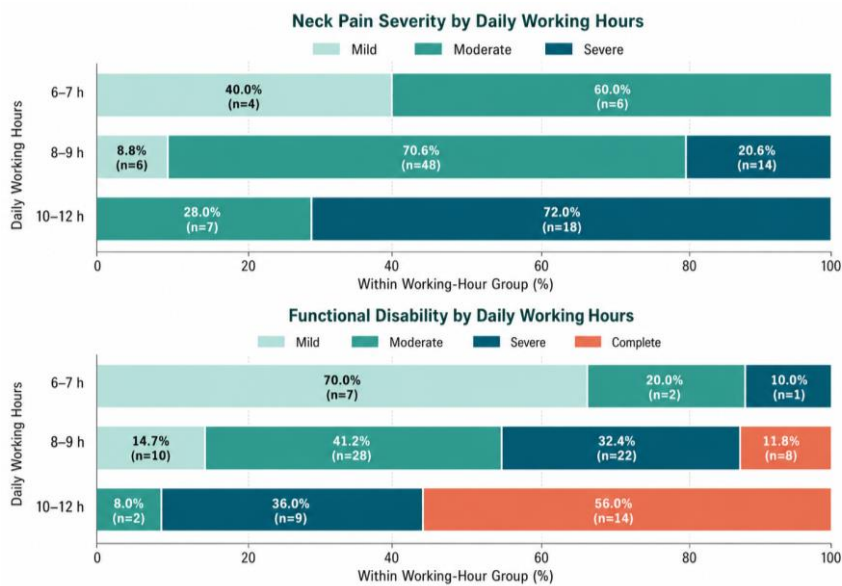
The association between daily working hours and functional disability is presented in Table 4. Functional disability also showed a clear increasing pattern across longer working-hour categories. Among participants working 6–7 hours per day, mild disability was most common, affecting 7 participants (70.0%), while 2 participants (20.0%) had moderate disability and 1 participant (10.0%) had severe disability. None had complete disability in this group. Among participants working 8–9 hours per day, moderate disability was most frequent, affecting 28 participants (41.2%), followed by severe disability in 22 participants (32.4%), mild disability in 10 participants (14.7%), and complete disability in 8 participants (11.8%). Among those working 10–12 hours per day, complete disability was the most frequent outcome, affecting 14 participants (56.0%), followed by severe disability in 9 participants (36.0%) and moderate disability in 2 participants (8.0%). No participant in the 10–12-hour group had mild disability. Pearson's chi-square test showed a statistically significant association between working hours and functional disability,  $\chi^2(6) = 49.283$ ,  $p < 0.001$ . The effect size was moderate to strong, with Cramer's V = 0.489.

**Table 4. Association Between Daily Working Hours and Functional Disability (n = 103)**

Functional Disability	6–7 Hours, n (%)	8–9 Hours, n (%)	10–12 Hours, n (%)	Total, n (%)	$\chi^2$	df	p-value	Cramer's V
Mild disability	7 (70.0)	10 (14.7)	0 (0.0)	17 (16.5)	49.283	6	<0.001	0.489
Moderate disability	2 (20.0)	28 (41.2)	2 (8.0)	32 (31.1)				
Severe disability	1 (10.0)	22 (32.4)	9 (36.0)	32 (31.1)				
Complete disability	0 (0.0)	8 (11.8)	14 (56.0)	22 (21.4)				
Total	10 (100.0)	68 (100.0)	25 (100.0)	103 (100.0)				

Overall, the findings demonstrate a consistent severity gradient across working-hour categories. Severe neck pain was absent among participants working 6–7 hours but increased to 20.6% among those working 8–9 hours and 72.0% among those working 10–12 hours. Similarly, complete functional disability increased from 0.0% in the 6–7-hour group to 11.8% in the 8–9-hour group and 56.0% in the

10–12-hour group. These findings indicate that longer daily working hours were significantly associated with both greater neck pain severity and higher functional disability among aestheticians.



*Figure 1. Severity Gradient of Neck Pain and Functional Disability Across Working Hours*

Severe neck pain increased progressively with longer working hours, rising from 0.0% among participants working 6–7 hours/day to 20.6% among those working 8–9 hours/day and 72.0% among those working 10–12 hours/day. A similar severity gradient was observed for functional disability, where complete disability increased from 0.0% in the 6–7-hour group to 11.8% in the 8–9-hour group and 56.0% in the 10–12-hour group. This pattern demonstrates a clinically meaningful shift from mild-to-moderate outcomes at shorter working durations toward severe pain and complete disability among aestheticians with the longest daily working hours.

## DISCUSSION

The present study demonstrated a substantial burden of neck pain and neck-related functional disability among aestheticians, with most participants reporting moderate neck pain and a considerable proportion reporting severe pain. Functional disability also showed a clinically meaningful distribution, with moderate and severe disability observed in nearly one-third of participants, while complete disability was reported by approximately one-fifth of the sample. These findings indicate that neck pain in aestheticians is not limited to transient discomfort but is associated with measurable functional consequences affecting daily activities. The pattern is occupationally important because aesthetic work commonly involves prolonged visual focus, forward head posture, sustained cervical flexion, repetitive upper-limb activity, and limited opportunity for postural variation, all of which may increase cumulative mechanical loading on the cervical region (14).

A key finding of this study was the significant association between daily working hours and neck pain severity. Severe neck pain increased progressively across working-hour categories, being absent among participants working 6–7 hours per day, present in approximately one-fifth of those working 8–9 hours per day and affecting nearly three-fourths of those working 10–12 hours per day. This dose-response pattern suggests that longer daily occupational exposure may be linked with increasing cervical strain. The finding is consistent with previous evidence showing that prolonged working duration and sustained static posture are important contributors to work-related musculoskeletal pain among beauticians, hairdressers, cosmetologists, office workers, and other professionals exposed to repetitive or constrained working postures (15,16).

The association between working hours and functional disability was also statistically significant and clinically relevant. Complete disability was not observed among participants working 6–7 hours per day but increased to 11.8% among those working 8–9 hours and 56.0% among those working 10–12 hours. This indicates that longer working hours were not only associated with higher pain severity but also with greater interference in functional activities. The parallel increase in pain severity and disability supports the concept that occupational neck pain may progress from symptom burden to functional limitation when exposure is prolonged and recovery time is insufficient. Comparable findings have been reported in occupational groups where prolonged static loading, repetitive movements, and inadequate ergonomic support were associated with higher disability scores and reduced work-related functional capacity (17,18).

The observed findings can be explained through several biomechanical mechanisms. During aesthetic procedures, workers frequently maintain the head and neck in forward flexion to achieve visual precision and access to the client. This position increases the load on the posterior cervical muscles and shoulder girdle, particularly the upper trapezius, levator scapulae, and cervical extensor muscles. Sustained low-level contraction can reduce local circulation, increase muscle fatigue, and promote accumulation of metabolic by-products, resulting in pain, stiffness, trigger points, and restricted movement. Over time, repeated exposure may contribute to greater disability by affecting soft tissues, cervical mobility, and tolerance for prolonged work tasks (19,20). The high proportion of severe pain and complete disability in the 10–12-hour group supports the clinical relevance of cumulative postural load in this occupational setting.

The results are broadly consistent with studies conducted among beauty salon workers and cosmetologists. Prior research among beauticians has reported notable frequencies of neck pain and disability, often linked with awkward posture, prolonged working duration, repetitive movements, fatigue, and poor ergonomic conditions (21). Studies among hairdressers and salon workers have similarly identified the neck as one of the commonly affected anatomical regions, with risk factors including long working hours, standing or sitting in sustained positions, repetitive upper-limb activity, and insufficient rest breaks (22). The present findings add to this body of evidence by showing that, among aestheticians, longer daily working hours are strongly associated with both pain severity and functional disability rather than pain alone.

The findings also align with evidence from other occupational groups exposed to static or precision-based posture, including dental professionals, surgeons, office workers, and computer-based workers. These professions share several ergonomic characteristics with aesthetic work, such as sustained cervical flexion, forward head posture, prolonged sitting or standing, and visually demanding tasks. Studies in these groups have reported high rates of neck pain and disability, supporting the interpretation that prolonged static posture and insufficient postural recovery are important contributors to cervical musculoskeletal symptoms (23,24). However, aestheticians may face additional challenges because salon and aesthetic-clinic environments may not always provide adjustable seating, optimized client positioning, magnification support, or structured ergonomic training.

The high level of functional disability observed in this study has practical implications for occupational health. Neck pain can reduce work efficiency, affect concentration, limit tolerance for prolonged client services, and contribute to fatigue or reduced quality of life. For aestheticians, whose work requires precision and sustained manual control, neck-related disability may also affect service quality and career longevity. The findings support the need for preventive strategies such as ergonomic education, adjustable seating, appropriate client-chair height, use of magnification when needed, scheduled microbreaks, posture correction, task rotation, and neck and shoulder conditioning exercises. Such interventions may help reduce cumulative cervical load and prevent progression from pain to disability.

Although the findings are statistically significant, they should be interpreted within the context of the study design. Because the study was cross-sectional, the association between working hours and neck-

related outcomes cannot establish temporal or causal direction. It is possible that longer working hours contribute to greater neck pain and disability, but it is also possible that individuals with pain perceive their work exposure as more burdensome. The use of convenience sampling may limit generalizability beyond the sampled aestheticians. In addition, pain severity and disability were self-reported, which may introduce response bias. Other relevant factors, including posture quality, ergonomic setup, physical activity, psychosocial stress, break duration, type of aesthetic procedures performed, and prior treatment history, were not controlled through multivariable analysis.

Despite these limitations, the study provides useful evidence that neck pain and functional disability are common among aestheticians and that both outcomes become more severe with longer daily working hours. The strength of the observed association, the ordered increase in severe pain and complete disability across working-hour categories, and the consistency with prior occupational literature support the relevance of working duration as an important modifiable workplace factor. Future research using longitudinal designs, ergonomic assessment tools, and adjusted statistical models could further clarify causal pathways and identify the most effective preventive interventions for this occupational group (19,20).

## CONCLUSION

This study concluded that neck pain and neck-related functional disability were highly prevalent among aestheticians, with moderate neck pain being the most commonly reported pain category and moderate-to-severe functional disability representing a substantial burden in the study population. Daily working hours showed a statistically significant association with both neck pain severity and functional disability, as participants working longer hours, particularly 10–12 hours per day, demonstrated markedly higher proportions of severe neck pain and complete disability compared with those working shorter hours. These findings suggest that prolonged occupational exposure may be an important contributor to cervical musculoskeletal strain and reduced functional capacity among aestheticians. Preventive workplace strategies, including ergonomic education, posture correction, scheduled rest breaks, task rotation, appropriate workstation adjustment, and neck-shoulder conditioning exercises, may help reduce pain severity and disability in this occupational group.

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