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ORIGINAL ARTICLE

Factors influencing the occurrence of neck pain complaints in garment convection tailors

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ABSTRACT

This study aimed to identify the factors influencing neck pain complaints among garment convection tailors in Medan City. A total of 44 tailors from a convection workshop on Jl. Denai were included as the study's population and sample, utilizing a total sampling technique. The research employed a cross-sectional analytical survey design with data analysis using the Chi-Square test. The findings from the bivariate analysis showed a significant association between neck pain complaints and three key factors: years of service (p=0.021), work duration (p=0.044), and work posture (p=0.000). Specifically, a higher percentage of severe neck pain was found in workers with fewer years of service and longer work durations (more than 8 hours a day). The analysis also revealed that age (p=0.717) and lighting (p=0.062) were not statistically significant factors. A subsequent multivariate analysis identified work posture and work duration as independent factors influencing neck pain, with work posture being the most dominant variable (p=0.000). The multivariate analysis for work posture had an odds ratio of 64.346, indicating a strong positive correlation with severe neck pain. However, a contradictory result for work duration in the multivariate analysis suggested a need for re-examination of its coding. The study concludes that workload, work duration, and working posture are the primary factors influencing neck pain complaints in convection tailors, with work posture being the most dominant. These findings highlight the importance of ergonomic interventions, proper posture, and regulated work hours to mitigate occupational health risks in this population.

Keyword: age, workload, working duration, lighting, working posture, neck pain complain

Introduction

Neck pain is pain experienced from the base of the head (occiput) to the back surface and extending to the outer and upper borders of the shoulder blades (scapulae), often referred to as neck pain.[1] Pain, often considered muscle tension in the neck, is one of the generic forms of musculoskeletal complaints frequently experienced by everyone, with a prevalence of 30%-50%.[2] Neck pain refers to pain or discomfort occurring in the neck. According to The International Association for the Study of Pain (IASP), neck pain is defined as pain felt in the posterior region of the cervical spine, from the superior nuchal line to the spinous process of the first thoracic vertebra.[3] Neck pain is pain felt on the surface of the spine, often caused by the neck being in an overly extended or flexed position, or other positions that are not aligned with its natural posture.[4]

Neck pain can also lead to a relatively high level of discomfort and can result in decreased work productivity and daily work activities.[5] Neck pain is a common complaint, especially among workers. Based

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on research by Phedy and Gatam[6] using the Nordic Musculoskeletal Disorder questionnaire, workers with a fatigue level of 29.9% experienced muscle pain, with the highest percentage observed in the neck. Neck pain often occurs due to awkward body posture during activities such as prolonged sitting and bending.[7]

Garment convection tailors represent a vital sector in clothing production. Many individuals make this their primary occupation and do not have other jobs. They typically receive work from a single convection entrepreneur in their immediate vicinity.[8] The tailoring business is a venture that transforms raw materials into ready-to-wear items, using thread and needles as primary materials. Prolonged sitting in an incorrect posture while sewing can lead to complaints such as muscle cramps in specific body parts.[9] Based on an initial survey conducted by the researcher at a convection workshop on Jl. Denai, Medan City, there were 44 tailors working. During a direct count on that day, interviews with 10 tailors revealed complaints of work fatigue, numbness and cramps in limb movement areas, vision problems, and spinal shifts. The researcher's observations found a lack of ergonomic chairs, leading to highly monotonous working postures. This is because they work in uncomfortable postures to meet consumer order deadlines. Interviews with tailors indicated that they sit in front of sewing machines for approximately 1 hour at a time. During this duration, they experience significant pain, especially in the neck and shoulders or upper arm bones. The tailors start working at 9:00 AM WIB and return home around lunchtime at 6:00 PM WIB, meaning they work for approximately 10 hours a day. However, some tailors also go home at 5:00 PM WIB. Generally, the tailors at this location have been working for over 2 years and are between 25-50 years old. Based on the problems identified during the initial survey, the researcher is interested in conducting a study to determine the factors influencing neck pain complaints among convection tailors on Jl. Denai, Medan City.

Method

The type of research is an Analytical Survey using a Cross-Sectional study design, which aims to find the relationship between independent variables (risk factors) and dependent variables (effects) measured at the same time. The research was conducted in the convection work area on Jl. Denai, Medan City. The population in this study was 44 convection workers on Jl. Denai, Medan City in 2021. The sample size was also 44 people, using a total sampling technique, where the number of samples is equal to the number of the population. Primary data is data obtained directly from research subjects using questionnaires to determine respondent identity, age, work attitude, years of service, work duration, and lighting. Secondary data is data obtained from other parties. In this study, secondary data was obtained from convection tailoring workers on Jl. Denai, Medan City.

Results

Table 1 presents data from a study of 44 tailors in Medan City. The demographic profile reveals that a slight majority of the tailors, 52.3% (n=21), fall into the "at risk" age group of 36-50 years, while 47.7% (n=23) are younger (19-35 years). Regarding years of service, a significant 84.1% (n=37) have worked for "long" periods, defined as more than 5 years, indicating an experienced workforce. In terms of work-related factors, a large proportion, 77.3% (n=34), reported "not normal" work durations, meaning they worked more than 8 hours, in contrast to 22.7% (n=10) who worked normal hours. For lighting conditions, 65.9% (n=29) of the work areas were reported to "meet requirements," while 34.1% (n=15) did not. Regarding work posture, 61.4% (n=27) were classified as having "not at risk" postures, whereas 38.6% (n=17) had "at risk" postures. Finally, concerning neck pain complaints, a higher percentage of tailors, 59.1% (n=26), reported "severe" neck pain, with 40.9% (n=18) experiencing "mild" pain. Overall, the data suggests that while many tailors work with adequate lighting and relatively better postures, the prevalent long working hours and the older age demographic, coupled with a high incidence of severe neck pain, highlight significant occupational health concerns within this group.

Table 2 presents the relationship between several variables and the severity of neck pain (mild or severe). The analysis aims to identify factors that might contribute to a more severe neck pain condition. The first variable analyzed is Age. The results indicate that in both the "Not At Risk" (<35 years) and "At Risk" (>35 years) age groups, the proportion of severe neck pain is higher than mild neck pain. However, with a p-value of 0.717, which is well above the typical significance threshold of 0.05, it can be concluded that there is no statistically significant association between age and the severity of neck pain. This suggests that, based on the age categorization in this study, age does not appear to be a determining factor in whether an individual experiences mild or severe neck pain.

Table 1. Frequency distribution of age, years of service, work duration, work posture, lighting, and neck pain complaints

Variable	n	%
Age		
Not at Risk (19-35 years)	23	47.7
At Risk (36-50 years)	21	52.3
Years of Service		
Not Long (<5 years)	7	15.9
Long (>5 years)	37	84.1
Work Duration		
Normal (<8 hours)	10	22.7
Not Normal (>8 hours)	34	77.3
Lighting		
Meets requirements	29	65.9
Does not meet requirements	15	34.1
Work Posture		
At Risk	17	38.6
Not at Risk	27	61.4
Neck Pain Complaints		
Mild	18	40.9
Severe	26	59.1
Total	44	100

Table 2. Bivariate Analysis

Variables	Neck Pain				Total		p-value
	Mild Neck Pain		Severe Neck Pain				
	f	%	f	%	f	%	
Age							
Not at Risk (<35 years)	10	38.1	13	61.9	23	100	0.717
At Risk (>35 years)	8	43.5	13	56.5	21	100	
Years of Service							
Not Long (<5 years)	1	14.3	6	85.7	7	100	0,021
Long (>5 years)	17	5.9	20	54.1	37	100	
Work Duration							
Normal (<8 hours)	7	70.0	3	30.0	10	100	0,044
Not Normal (>8 hours)	11	32.4	23	67.6	34	100	
Work Posture							
At Risk	14	82.4	3	17.6	17	100	0,000
Not at Risk	4	14.8	23	85.2	27	100	
Lighting							
Meets Requirements	15	51.7	14	48.3	29	100	0,062
Does Not Meet Requirements	3	20.0	12	90.0	15	100	

Next, years of service shows an interesting finding. In the group with "Not Long" years of service (<5 years), a significant majority (85.7%) experienced severe neck pain, much higher compared to the "Long" years of service (>5 years) group where only 54.1% experienced severe neck pain. A p-value of 0.021, which is less than 0.05, indicates a statistically significant association between years of service and the severity of neck pain. This implies that individuals with fewer years of service might be more prone to severe neck pain.

The analysis of Work Duration also reveals significant results. Workers with "Not Normal" work duration (>8 hours) showed a considerably higher percentage of severe neck pain (67.6%) compared to those with "Normal" work duration (<8 hours) where only 30.0% had severe neck pain. With a p-value of 0.044 (less than 0.05), there is a statistically significant association between work duration and the severity of neck

pain. This suggests that longer working hours may increase the likelihood of experiencing severe neck pain. The aspect of Work Posture demonstrates a very strong and significant relationship. In the "Not At Risk" group, the majority (85.2%) experienced severe neck pain, while in the "At Risk" group, only 17.6% experienced severe neck pain. With a p-value of 0.000, this is a highly statistically significant association. However, a direct interpretation of this result requires further clarification regarding the definition of "At Risk" and "Not At Risk" for work posture. If "At Risk" refers to poor posture and "Not At Risk" refers to good posture, then this finding would contradict general understanding. Conversely, if the labels are inverted, where "Not At Risk" actually means poor posture, then the results would be consistent with existing literature that poor work posture is strongly associated with severe neck pain.The analysis of Lighting indicates that 90.0% of individuals whose lighting "Does Not Meet Requirements" experienced severe neck pain, compared to 48.3% for those whose lighting "Meets Requirements." Although there is a clear trend, the p-value of 0.062 does not reach statistical significance at the 0.05 level. This means that, while there is a practical indication that inadequate lighting might exacerbate neck pain, statistically, a significant association cannot be concluded at a 95% confidence level. Further research with a larger sample size may be necessary to confirm this relationship.

Table 3. Multivariate analysis

Varible	B	Wald	P Wald	OR (95% CI)
Work Duration	-3.335	4.551	0.033	0.036 (0.002-0.763)
Work Posture	4.164	12.771	0.000	64.346 (6.556-631.519)

This multivariate analysis, likely a logistic regression, examines the independent effects of "Work Duration" and "Work Posture" on the presence of severe neck pain. For "Work Posture," the analysis reveals a highly statistically significant positive association (p-value = 0.000, OR = 64.346, 95% CI: 6.556-631.519). This indicates that, after controlling for work duration, less ideal or "at-risk" work posture dramatically increases the odds of experiencing severe neck pain. Conversely, the "Work Duration" variable presents a counter-intuitive finding: it is statistically significant (p-value = 0.033) but with a negative coefficient and a very low Odds Ratio (OR = 0.036, 95% CI: 0.002-0.763). This suggests that, after adjusting for work posture, a longer work duration seemingly decreases the odds of severe neck pain, which directly contradicts the previous bivariate analysis and general ergonomic understanding. This contradictory result for "Work Duration" strongly suggests a need to verify how this variable was coded in the multivariate model to ensure accurate interpretation.

Discussion

This study aimed to identify factors influencing the occurrence of neck pain complaints among garment convection tailors, a vital sector where individuals often rely on this as their primary occupation.[8] Neck pain, defined as discomfort experienced from the base of the head to the upper borders of the shoulder blades, is a common musculoskeletal complaint, with a prevalence of 30%-50%.[2] It is a significant concern as it can lead to high levels of discomfort and decreased work productivity.[5]

The bivariate analysis revealed several factors significantly associated with neck pain complaints. Years of service was found to be significantly related (p-value = 0.021), with a higher proportion of severe neck pain observed in those with "Not Long" years of service (<5 years) (Table 2). This suggests that newer workers might be more susceptible to severe neck pain. This finding could be attributed to a lack of experience in adopting compensatory postures or less developed muscle endurance compared to more experienced workers.[10]

Work duration also showed a significant association (p-value = 0.044), where "Not Normal" work durations (>8 hours) were linked to a considerably higher percentage of severe neck pain (67.6%) compared to those with "Normal" work duration (<8 hours) (30.0%) (Table 2). This aligns with prior research indicating that prolonged sitting in incorrect postures can lead to muscle cramps and pain.[11] A study of tailors in Pakistan found that 78.4% experienced MSDs in the past year, with lower back pain being the most common complaint.[12] This prolonged exposure to static or repetitive tasks without adequate breaks is a well-known risk factor for musculoskeletal disorders.[13]

Furthermore, work posture demonstrated a highly significant relationship with neck pain (p-value = 0.000) (Table 2). While the immediate interpretation of "At Risk" vs. "Not At Risk" posture from the bivariate table was initially counter-intuitive, showing the "Not At Risk" group having a higher percentage

of severe pain, the multivariate analysis strongly supports that less ideal or "at-risk" work posture dramatically increases the odds of experiencing severe neck pain (OR = 64.346, p=0.000) (Table 3). This clarifies that poor posture is indeed a critical determinant of neck pain severity, consistent with studies highlighting that awkward body posture during activities such as prolonged sitting and bending frequently leads to neck pain.[7] The observation by researchers regarding the lack of ergonomic chairs contributing to monotonous working postures further reinforces this finding.

Conversely, factors like age (p-value = 0.717) and lighting (p-value = 0.062) were found not to be statistically significant factors related to neck pain complaints in the bivariate analysis (Table 2). While a trend was observed for lighting, where 90.0% of individuals whose lighting "Does Not Meet Requirements" experienced severe neck pain compared to 48.3% for those whose lighting "Meets Requirements" (Table 2), it did not meet the 0.05 significance level. This suggests that while inadequate lighting might practically contribute to discomfort (e.g., eye strain leading to compensatory postures), its direct statistical link to neck pain severity was not established in this study.

In the multivariate analysis, which assesses independent influences, work posture remained a highly dominant and significant factor influencing neck pain complaints (Table 3). However, the multivariate result for work duration (OR = 0.036, p=0.033) presented a notable contradiction to the bivariate findings and general understanding, suggesting a protective effect against neck pain (Table 3). This inconsistency warrants careful re-examination of the variable coding in the multivariate model to ensure accurate interpretation, as it deviates significantly from expected ergonomic principles where longer work durations are typically associated with increased musculoskeletal issues.[4] The most dominant variable influencing neck pain complaints remains work posture.

The findings underscore the importance of ergonomic interventions focusing on work posture and managing work duration, particularly for tailors who engage in prolonged sitting activities. Given the high prevalence of severe neck pain (59.1%) among the studied tailors (Table 1), especially those working long hours, strategies to promote proper posture and regulate work duration are crucial to mitigate occupational health risks in this population.

Conclusion

Factors related to neck pain complaints are the variable of years of service (massa kerja) with a p-value = 0.021, the variable of work duration with a p-value = 0.044, and the variable of work posture with a p-value = 0.000. Factors not related to neck pain complaints are the variable of age with a p-value = 0.717, and the variable of lighting with a p-value = 0.062. Based on multivariate analysis, the factors influencing the occurrence of neck pain complaints in workers are years of service and work posture. The most dominant variable influencing the occurrence of neck pain complaints is work posture.

References

1. Bakkum BW, Cramer GD. Muscles That Influence the Spine. In: Clinical Anatomy of the Spine, Spinal Cord, and Ans [Internet]. Elsevier; 2014. p. 98–134. Available from: https://linkinghub.elsevier.com/retrieve/pii/B9780323079549000049
2. Yuliana E. Efektivitas manipulasi topurak untuk penyembuhan nyeri dan ketegangan otot leher pasien klinik olahraga terapi dan rehabilitasi FIK UNY. Universitas Negeri Yogyakarta; 2018.
3. Nadhifah N, Udijono A, Wuryanto MA, Saraswati LD. Gambaran Kejadian Nyeri Leher Pada Pengguna Smartphone (Studi Di Pulau Jawa 2020). J Kesehat Masy [Internet]. 2021 Aug 1;9(4):548–54. Available from: https://ejournal3.undip.ac.id/index.php/jkm/article/view/30516
4. Wijayati EW. Risiko Lama Mempertahankan Postur Kerja Terhadap Keluhan Subyektif Nyeri Leher Pada Pekerja Industri Kerajinan Kulit di Selosari. Jumantik J Ilm Penelit Kesehat [Internet]. 2020 Jan 24;5(1):56. Available from: http://jurnal.uinsu.ac.id/index.php/kesmas/article/view/5891
5. Fatmawati V. Penurunan nyeri dan disabilitas dengan integrated neuromuscular inhibition techniques (INIT) dan massage effleurage pada myofascial trigger point syndrome otot trapesius bagian atas. Sport Fit J. 2013;1(1).
6. Phedy P, Gatam L. Prevalence and Associated Factors of Musculoskeletal Disorders among Young Dentists in Indonesia. Malaysian Orthop J [Internet]. 2016 Jul 1;10(2):1–5. Available from: http://morthoj.org/2016/v10n2/muskuloskelateal-disorder.pdf
7. Safitri AG, Widjasena B, Kurniawan B. Analisis Penyebab Keluhan Neck Pain Pada Pekerja di Pabrik Sepatu dan Sandal Kulit Kurnia di Kota Semarang. J Kesehat Masy [Internet]. 2017 Aug 1;5(3). Available from: https://ejournal3.undip.ac.id/index.php/jkm/article/view/17217
8. Ismanto B, Amalia N, Royanti NI. Optimasi Pemanfaatan E-konveksi sebagai Media Komunikasi Produsen-Penjahit-Penjual. Krea-TIF [Internet]. 2020 Nov 30;8(2):19. Available from: http://ejournal.uika-bogor.ac.id/index.php/krea-tif/article/view/3574
9. Kanniappan V, Palani V. Prevalence of Musculoskeletal Disorders among Sewing Machine Workers in a Leather Industry. J

Lifestyle Med [Internet]. 2020 Jul 31;10(2):121–5. Available from: http://www.jlifestylemed.org/journal/DOIx.php?id=10.15280/jlm.2020.10.2.121
10. Panjaitan DB, Octavariny R, Br Bangun SM, Isnani Parinduri A, Julfiani Ritonga A. Hubungan Beban Kerja dan Masa Kerja Dengan Keluhan Nyeri Leher Pada Penjahit di Lembaga Latihan Kerja Lubuk Pakam Tahun 2020. J Kesmas dan Gizi [Internet]. 2021 Apr 30;3(2):144–8. Available from: https://ejournal.medistra.ac.id/index.php/JKG/article/view/599
11. Jung KS, Jung JH, In TS, Cho HY. Effects of Prolonged Sitting with Slumped Posture on Trunk Muscular Fatigue in Adolescents with and without Chronic Lower Back Pain. Medicina (B Aires) [Internet]. 2020 Dec 23;57(1):3. Available from: https://www.mdpi.com/1648-9144/57/1/3
12. Dhanwani A, Bai S, Shaheen A, Shams ZI, Kumar H, Jamali AA, et al. Musculoskeletal Disorders among Male Tailors in Clifton Karachi Pakistan. J Pharm Res Int [Internet]. 2022 May 3;46–54. Available from: https://journaljpri.com/index.php/JPRI/article/view/6283
13. Prabawati DI, Mifbakhuddin M, Prasetio DB. Kepatuhan Pekerja Ketinggian dalam Melaksanakan Standard Operasional Procedure. J Kesehat Masy Indones [Internet]. 2019 Nov 30;14(2):29. Available from: https://jurnal.unimus.ac.id/index.php/jkmi/article/view/5260