

Profiling Musculoskeletal Condition in Female Tailors by Using Nordic Musculoskeletal Questionnaire

Momina Khanum¹, Rakesh M²

^{1,2} Cauvery college of physiotherapy, Mysore Karnataka.

Crossref DOI: <https://doi.org/10.63363/aijfr.2026.v07i05.8480>

Abstract

Musculoskeletal disorder is one of the commonest problems that result from constant work in tailors due to awkward posture, and not using proper ergonomics tools and static load on posture. This study aimed to determine the prevalence of musculoskeletal disorders among female tailors by using Nordic musculoskeletal questionnaire. A total of 60 subjects with musculoskeletal disorder are assessed using self-structured proforma and Nordic musculoskeletal questionnaire, which collect information on work related variables and the ergonomic assessment of their workstation. Nordic musculoskeletal questionnaire is a standardized tool used to assess the prevalence and impact of musculoskeletal pain. The result of this study showed that musculoskeletal disorders such as thigh, neck, ankle, elbow pain is a commonest health problem among Tailors. In this study thigh pain 58.3% is highest among tailors of Ummat Education tailoring institute and local tailors of Mysore. The results highlight that awkward posture, static work load and long duration of working hours may increases the risk of musculoskeletal disorders among tailors. Introducing ergonomically designed working tools, workstation and healthy posture habits may reduce the risk of musculoskeletal disorder and promote the wellbeing among tailors.

Keywords: Musculoskeletal disorders, Tailors, Nordic musculoskeletal questionnaire, Ergonomics.

1. Introduction

Ergonomics is the investigation of the relationship between man and his working environment ⁽¹⁾. Ergonomics is a science aimed at reducing the negative impact of the environment on human beings, so that each will be able to give full scope of what he can contribute to a certain job ⁽²⁾. Various inflammatory and degenerative diseases involving muscles, tendons, ligaments, joints, peripheral nerves and the supporting blood vessels are collectively known as Musculoskeletal disorders (MSD). ⁽³⁾ Work related MSDs are caused when the demands of the job do not match the physical capacity of the human body, depending upon the physical motion (such as repetition), ergonomic and mechanical design of work task ⁽³⁾. The tailoring profession is amongst those at higher risk for MSDs ⁽⁴⁾. Task tailor ability is commonly promoted through the use of constrained positions, repeated actions and high levels of static force, known

to be one of the main musculoskeletal risk factors in occupation related MSD⁽⁵⁾. Tailors however, sit and in order to see well they have to bend forward over the sewing piece and they would do this with no support on their back and an excessive bending forward of their upper and lower lumbar back⁽⁵⁾. The work of stitching is typically characterized by keeping both hands on the sewing machine table to hold the article of stitching, both feet pressing the saddle motor, with neck twisted forward.⁽⁴⁾

The WMSDs typically result from repeated and prolonged injury/trauma or pressure to tendons, bones or joints, and muscles.⁽⁶⁾ As a result of repetitive works also from the disregard to the principles of ergonomics.⁽⁶⁾ They were also having muscles stiff and pain with swelling in the region.⁽⁷⁾ This pain, and muscle stiffness is pain so severe that it doesn't allow you to carry on with their occupation, and in latter stages it doesn't even let you sleep.⁽⁷⁾ Prolonged sitting in awkward postures is common among tailors, often worsened by the use of seats without backrests.⁽⁸⁾ As a result, tailors experience significant physical strain, particularly in the shoulders, neck, back, and lower limbs.⁽⁸⁾ These issues typically arise or become more severe when the head is bent forward, the arms are raised, or the body is positioned in a forward-leaning stance.⁽⁸⁾ Conducting ergonomic assessments among tailors is essential, as ergonomics serves as a form of preventive medicine against work-related musculoskeletal (MSK) disorders.⁽⁸⁾ Highlighting its significance, the World Health Organization even designated the 2000s as the decade for the prevention of musculoskeletal disorders (MSDs)⁽⁸⁾ In this study, ergonomic principles were applied to assess the work environment and identify the prevalence and contributing factors of work-related musculoskeletal disorders (MSDs) among tailors in the Enugu metropolis⁽⁵⁾.

In this study, work-related musculoskeletal disorders (MSDs) were assessed using the Nordic Musculoskeletal Questionnaire, while a researcher-designed proforma was used to collect demographic details, work-related characteristics, and to perform a comprehensive ergonomic evaluation of the tailors' workstations⁽⁵⁾ Most tailors were observed sitting at the edge of their seats with significant trunk and neck flexion exceeding 45 degrees.⁽⁶⁾ Additionally, 90% had their knees flexed forward at approximately 110 degrees, and their seats lacked the ability to tilt.⁽⁶⁾ Reported symptoms included neck and shoulder pain in 97% of the participants, upper arm pain in 43%, elbow and forearm pain in 3%, chest pain in 58%, and finger pain in 2%. Fifty-five percent used stools as seating, while fifty percent used chairs. Of these, 35% of the stools and 43% of the chairs were cushioned.⁽⁶⁾

A study revealed that prolonged forward-leaning postures and continuous sitting on stools without backrests were commonly observed among female tailors.⁽⁶⁾ The repetitive nature of tailoring work imposes cumulative stress on the musculoskeletal system, particularly the spinal column, leading to a high prevalence of discomfort and pain in various parts of the body. Additionally, painful work-related injuries, such as needle punctures—most frequently affecting the right forefinger—were commonly reported among tailors.⁽⁶⁾ The primary challenges faced by tailors include poor working posture, physical fatigue, and mismatches between the worker and their tools or workstation.⁽⁶⁾ There is often inadequate coordination between the eyes, hands, and feet during tasks, these issues are largely attributed to poorly designed workspaces.⁽⁶⁾ Improving the ergonomics of the workstation—by incorporating female-specific anthropometric measurements such as optimal work surface height, seat height and depth, and appropriate backrest support—can significantly enhance comfort and reduce health risks.⁽⁶⁾

The main challenges faced by tailors include poor working posture, physical fatigue, improper alignment between the worker and their tools (man-machine mismatch), and inadequate coordination of the eyes,

hands, and legs during tasks. ⁽⁶⁾ These issues are often the result of poorly designed workstations. ⁽⁶⁾ Adjusting the workplace design using anthropometric measurements specific to females—such as appropriate work surface height, seat dimensions, seat height, and backrest support—can significantly enhance comfort and reduce strain ⁽⁶⁾

2. Materials and methods

Study design: this study was conducted as observational study to profile the musculoskeletal condition due to altered ergonomics in female tailors by using Nordic musculoskeletal questionnaire

Study setting and duration: The research was conducted at Ummat education tailoring institute and local tailors from different place of Mysore, Karnataka over a period of (6 months) the tailoring workstation does not have proper ergonomic arrangements and setups which may lead to discomfort and increase risk of musculoskeletal disorders among female tailors.

2.1 Participants

A total of 60 female tailors participated in this study, participants include only female tailors from Ummat education tailoring institute and different places of Mysore.

2.2 Inclusion and exclusion criteria

Inclusion criteria

- Studies on ergonomics in tailors
- Studies on effect of ergonomics in musculoskeletal disorder
- only female patients were included
- only age of 18- 45 years of women were included
- only tailors who stich more than 2 hrs per day is included

Exclusion criteria

- only female patients were included
- only age of 18- 45 years of women were included
- only tailors who stich more than 2 hrs per day is included

3. Result and Discussion

Discussion: “The purpose of the study is Profiling musculoskeletal condition in female tailors by using Nordic musculoskeletal questionnaire” among the age group of 18-45 years of age. There is data on Effect of ergonomics causes MSKDs in Tailors.

The study was conducted in Ummat Education Tailoring Institute, Mysore and in local Tailors of different parts of Mysore. The Tailors were selected based on the inclusion and exclusion criteria. A self-structured proforma which contains 16 questions score of 40 was used to obtain their demographic information, work related variables and their ergonomic assessment of their workstation, the score was categorized as more than 35 was severe, more than 25 was moderate, more than 15 mild and more than 10 no needs ergonomic

education. A Standardized Nordic musculoskeletal questionnaire was used to measure their occupational related musculoskeletal disorders.

According to the area it was categorized and their percentage was taken to check the prevalence of pain in different musculoskeletal areas. In this study the prevalence of highest pain in tailors is Right Thigh (58.3%), Neck (43.3%), Low back ache (38.3%) , Right ankle (33.3%), Right elbow (30%), The prevalence of moderate pain in Right shoulder (18.3%), Left elbow (16.6%), Right wrist (15%), Right knee (15%), Upper back ache (13.3%), Left ankle (13.3%), Left shoulder (11.6%), Left Thigh (11.6%), The prevalence of lowest pain in Right hip (10%), Left knee (6.6%), Right feet (6.6%), Left wrist (5%), Left hip (3.3%), Left feet (3.3%)

The highest pain was reported in Right thigh is due to Prolong sitting, non-ergonomic work setup, over use of leg muscles, Use of foot pedals, leaning forward while sewing alters pelvic alignment stressing thigh muscles which can lead to muscle fatigue, reduced blood flow, irritation of bursae around the thigh resulting in pain and discomfort.

The prevalence of pain in Neck, LBA, Right ankle and elbow is due to sitting without backrest, Arm rest and foot rest, constant neck bending and forward head, sitting with back bent, repeated hand and arm movements causing strain on elbow joint, lack of breaks and continues use of foot pedals lead to strain in ankle plantar and dorsiflexors.

The prevalence of pain in upper back, shoulder, wrist, hip, knees and Feet is due to static work load on spine, repetitive arm lifting during cutting and sewing, awkward wrist angle while stitching, prolong sitting in stools and leaning to one side, fixed bent knee posture, continues use of foot pedal with one leg and standing on harder surface leads to pain in different areas of MSKs.

Hence, the study successfully revealed that altered ergonomics leads to musculoskeletal disorders in tailors. The tailors need to correct the ergonomics while sewing so that it prevents musculoskeletal disorders. The awareness about the risk factors, proper positioning of the body during work, and advising them to take breaks in between the work.

However, interventions to reduce musculoskeletal disorders should take into account not only ergonomics but also provide an appropriate working environment and tools like Ergonomic chair, Anti-fatigue mat and supportive gloves to reduce the incidence and worsening of the condition.

The sewing operator's awkward working posture—specifically sitting on a chair without a backrest—leads to discomfort in various parts of the body.⁽¹²⁾ The sewing task involves repetitive, high-frequency movements, making it highly susceptible to Musculoskeletal Disorders (MSDs).⁽¹²⁾ Operators have reported pain in the lower back, buttocks, calves, and waist, largely due to the lack of back support.⁽¹²⁾ The absence of a backrest causes the operator to fatigue more quickly, as the back is not adequately supported.⁽¹²⁾ Previous research has suggested using cushions or pillows for support as a way to reduce the risk of developing MSDs.⁽¹²⁾

Tailors who remain in prolonged static sitting positions are at increased risk of developing poor posture, which can lead to lower back pain.⁽¹³⁾ They typically spend long hours seated in front of sewing machines or work tables, contributing to this issue.⁽¹³⁾

The current study revealed that at least 60% of tailors reported experiencing neck and back pain.⁽¹⁴⁾ This discomfort was largely associated with the frequent use of improper working postures, notably neck flexion greater than 20° and trunk flexion between 20° and 45°, especially during tasks such as cutting, stitching, over-locking, and ironing.⁽¹⁴⁾ Additionally, a high prevalence of upper arm pain was observed among tailors.⁽¹⁴⁾ While the risk scores for the lower arm were relatively low, it remains concerning that 35% of tailors did not maintain a neutral or near-neutral posture in the lower arms.⁽¹⁴⁾

The findings of this study indicate that work-related fatigue significantly impacts the craniovertebral angle, cranial angle, and shoulder angle in both groups of tailors.⁽¹⁵⁾ This effect was more pronounced in tailors experiencing non-specific chronic neck pain. These results are consistent with previous research conducted in this area.⁽¹⁵⁾

The results indicate a significant correlation between work experience and the occurrence of work-related musculoskeletal disorders (WMSDs) among tailors, suggesting that greater work experience is associated with a higher prevalence of these disorders.⁽¹⁶⁾ This finding also highlights the role of training in influencing the occurrence of WMSDs.⁽¹⁶⁾

The prevalence of musculoskeletal disorders (MSDs) among workers in small-scale garment industries was reported to be 78.5% and 69.64% in two separate studies, with the neck being the most commonly affected area in both—findings that are consistent with the present study.⁽³⁾ The high rate of neck involvement can likely be attributed to prolonged periods of stooping with the neck in a flexed position, along with continuous eye strain caused by insufficient task lighting.⁽³⁾

4.Result

This result was obtained by using MS EXCEL. In this study 60 participants (tailors) were included voluntarily in data analyses. Participants were included based on inclusion and exclusion criteria, The age group of 18-45 years. A self-structured Performa which contains 16 questions score of 40 was used to obtain their demographic information, work related variables and their ergonomic assessment of their workstation, the score was categorized as more than 35 require severe ergonomic education, more than 25 required moderate ergonomic education, more than 15 require mild ergonomic education and less than 10 no need of ergonomic education. The result obtained as 67% were require moderate ergonomic education, 23% require mild ergonomic education, 5% require severe ergonomic education, and 5% need no ergonomic education.

A Standardized Nordic musculoskeletal questionnaire was used to measure their occupational related musculoskeletal disorders. According to the area it was categorized and their percentage was taken to check the prevalence of pain in different body areas.

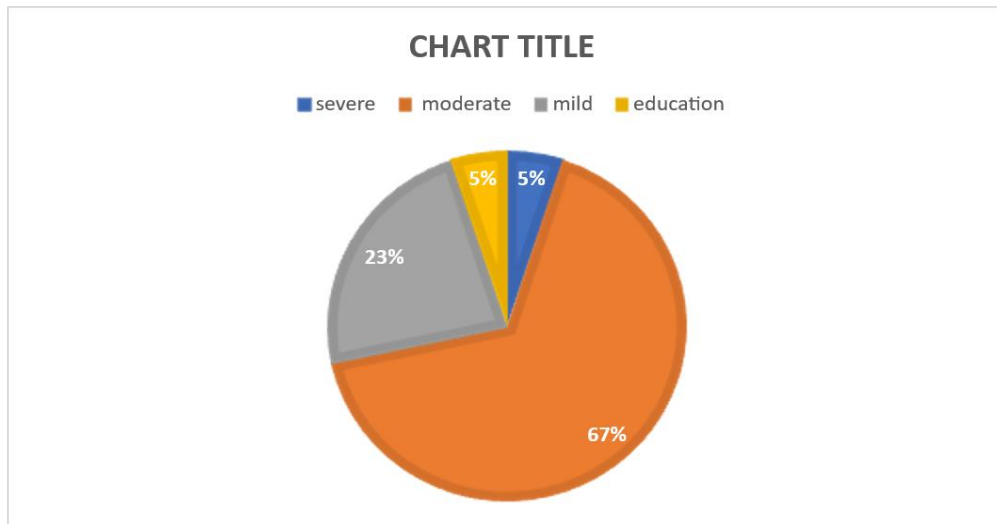


Fig 1: showing need of moderate ergonomic education among female tailors.

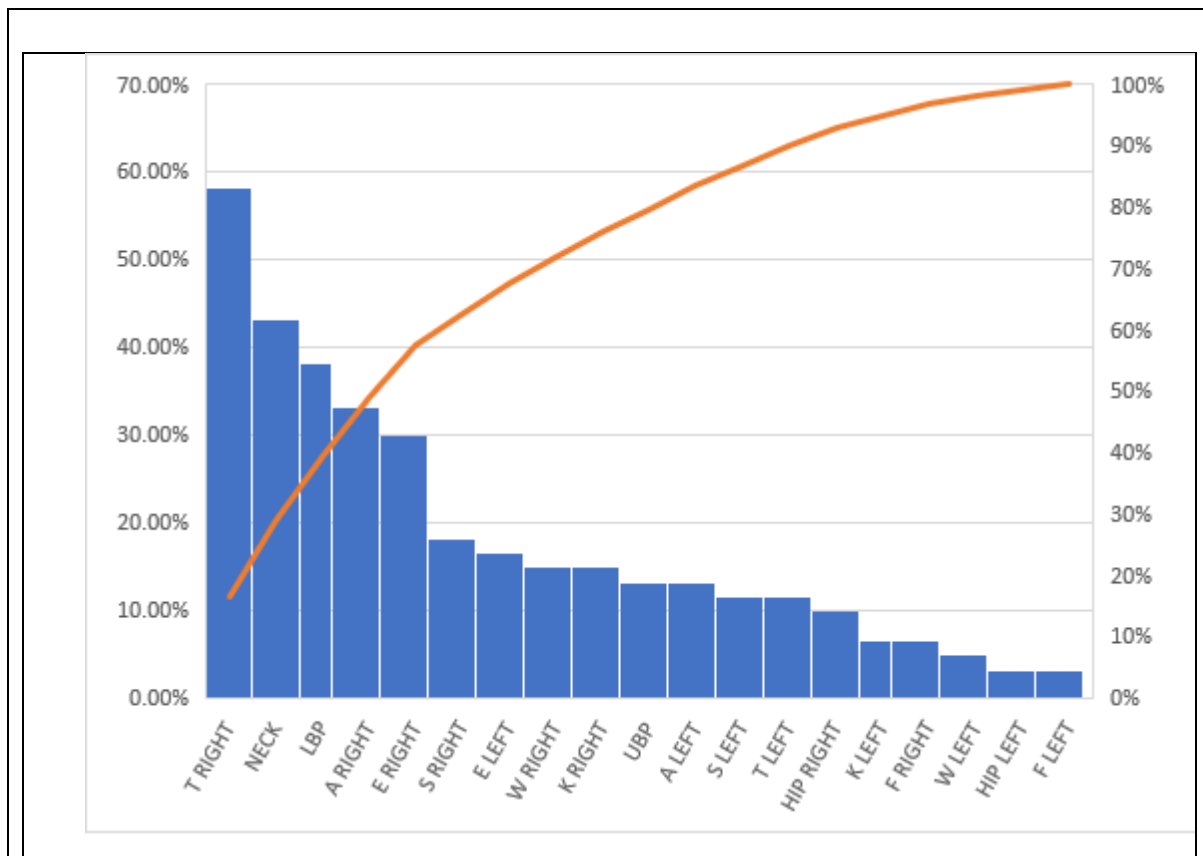


Fig 2: prevalence of pain in different body area showing highest pain in right thigh, neck and lower back.

A Nordic musculoskeletal questionnaire was used to measure their occupational related musculoskeletal disorders. According to the area it was categorized and their percentage was taken to check the prevalence of pain in different body area.

The prevalence of highest pain in tailors is Right Thigh (58.3%), Neck (43.3%), Low back ache (38.3%), Right ankle (33.3%), Right elbow (30%), The prevalence of moderate pain in Right shoulder (18.3%), Left elbow (16.6%), Right wrist (15%), Right knee (15%), Upper back ache (13.3%), Left ankle (13.3%), Left shoulder (11.6%), Left Thigh (11.6%), The prevalence of lowest pain in Right hip (10%), Left knee (6.6%), Right feet (6.6%), Left wrist (5%), Left hip (3.3%), Left feet (3.3%).

Table:1 distribution and severity of pain across different body region in female tailors

AREA	PERCENTAGE OF POPULATION
RIGHT THIGH	58.3%
NECK	43.3%
LOWER BACK	38.3%
RIGHT ANKLE	33.3%
RIGHT ELBOW	30%
RIGHT SHOULDER	18.3%
LEFT ELBOW	16.6%
RIGHT WRIST	15%
RIGHT KNEE	15%
UPPER BACK	13.3%
LEFT ANKLE	13.3%
LEFT SHOLDER	11.6%
LEFT THIGH	11.6%
RIGHT HIP	10%
LEFT KNEE	6.6%
RIGHT FEET	6.6%
LEFT WRIST	5%
LEFT HIP	3.3%
LEFT FEET	3.3%

5. Conclusion

The finding of this study showed that musculoskeletal disorders such as thigh, neck, ankle, elbow pain is a commonest health problem among Tailors. In this study thigh pain 58.3% is highest among tailors of Ummat Education tailoring institute and local tailors of Mysore. Socio-demographic or individual related characteristics such as awkward posture while in work and duration of work were associated with musculoskeletal disorders. The main reasons given by respondents for musculoskeletal disorders during this activity were static work load, no proper ergonomic tool and prolong adaptation of poor posture. Introducing ergonomically designed working tools, workstation and healthy posture habits may reduce the risk of musculoskeletal disorder and promote the wellbeing among tailors.

6. Acknowledgement

First and foremost, I would like to thank Almighty and my father KHAISER ULLA KHAN and my mother NIGAR SULTANA and my sister RUKHSAR KHANUM and beloved teachers and my friend SWETAL PATEL and MUSKAAN FATHIMA, for their valuable support and confidence throughout.

I wish to thank our respectable professor and principal PAVAN KUMAR G, Cauvery college of physiotherapy, Mysore, for the valuable guidance he offered

I wish to express my gratitude to my guide Dr. NISHANTHI VIJAYAN (PT), Assistant professor, Cauvery college of physiotherapy, Mysore for her valuable guidance and keen interest shown in this project work.

I express my gratitude to my beloved friend without whom this work would not have been possible

References

1. Thakkar K, Kajiwarra I, Rodak D, Bald Aniya J, Tandel J. Prevalence of Work-related Musculoskeletal Disorders and its Correlation with Ergonomic Risk Assessment among Tailors: A Cross-sectional Study.
2. Sohail A, Qutbuddin S, Alora P. Ergonomic Risk Assessment and Postural Analysis of Workers in Small Garment Industries by RULA using Digital Human Modelling. Operations Management. 2021;12.
3. Banerjee S, Bandyopadhyay L, Dasgupta A, Paul B, Chattopadhyay O. Work related musculoskeletal morbidity among tailors: A cross-sectional study in a Slum of Kolkata. Kathmandu Uni Med J (KUMJ). 2016 Oct 1;14(56):305-10.
4. Andriani B, Camelia A, Faizy HF. Analysis of working postures with musculoskeletal disorders (MSDNs) complaint of tailors in Ulak Kerb au Baru village, Ogan Ilir. Jurnal Ilmiah Kesehatan Masyarakat. 2020 May 30;11(01):75-88.
5. Ekechukwu EN, Okolo NC, Atreyi BC. Ergonomic evaluation and the predictors of occupation related musculoskeletal disorders among tailors in Enugu Metropolis. Journal of the Nigeria Society of Physiotherapy. 2021 Sep 30;20(1):33-41.
6. Jarmo SA, Sheikh MA, Rajput HI, Chughtai MJ, Amanullah D, Jarmo DA. Work-related musculoskeletal disorders among tailors. Int J Pharmaceutical Sci Health. 2018;2(8):18-25.

7. Anwar N, Riaz H, Saeed A, Ashraf F. Frequency of work-related musculoskeletal disorders and ergonomic risk assessments among tailors. JPMA. 2020;70(2164).
8. Upasana VD. Ergonomic Assessment of Work Pattern and Related Musculoskeletal Discomfort Among Tailors. Int J Sci Environ Technol. 2019;8(4):867-73.
9. Kazemi S, Asgari A, Khatib M, Poya far L, Mohammadi M. Determining the prevalence of musculoskeletal disorders in tailors in Kermanshah, Iran using the Nordic questionnaire (2018). International Journal of Health and Life Sciences. 2019 Jan 31;5(1)
10. Laal F, Mirzaei R, Bandani MS, Mohammadi M, Kodama K. Evaluation of the influence of ergonomic intervention on the musculoskeletal disorders of Zahedan tailors. International Journal of Occupational Safety and Ergonomics. 2017 Jul 3;23(3):380-5.
11. Ahmad S, Aamir S, Gul F, Wahid E, Khan MS, Khan A. Work-Related Musculoskeletal Disorders Among Tailors in Saddar, Peshawar: A Cross-Sectional Study. Journal of Modern Health and Rehabilitation Sciences. 2025 Jun 16:ID-104.
12. Muslimah E, Permata sari DU, Nugroho MT, Suranto S, Pratiwi I, Nadirah S. Ergonomic Assessment of Sewing Machine Operators to Minimize Musculoskeletal Disorders. InSHS Web of Conferences 2024 (Vol. 189, p. 01022). EDP Sciences.
13. Anjali PA, Thanaya SA, Indrayani AW, Atari NK. The correlation between work posture and lower back pain among tailors. Physical Therapy Journal of Indonesia. 2024 May 31;5(1):91-4.
14. Ncube F, Kanda A, Chiren gendure Y. An evaluation of ergonomic risks associated with tailoring tasks using the rapid entire body assessment method. International Journal of Human Factors and Ergonomics. 2019;6(2):124-42.
15. Hejazi far H, Sheikh Hosseini R, Piri H, Sayyadi P. The Comparison of Fatigue and Trunk and Neck Postures during Working in Tailors with and Without Nonspecific Chronic Neck Pain. Iranian Journal of Ergonomics. 2022 Jul 10;10(1):56-64.
16. EKPO G, IWUNNA K. Determinants of Work-Related Musculoskeletal Disorders Among Tailors in Rivers East Senatorial District, Rivers State.