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Prevalence Of Low Back Pain Among Sewing Machine Operators

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ABSTRACT

Background:

A frequent musculoskeletal condition is low back pain, especially in workers who adopt extended or repetitive postures. Because of the nature of their employment, which sometimes entails prolonged sitting, repetitive motions, and perhaps poor ergonomics, sewing machine operators are among such group that frequently faces the exposure of getting back injuries. Over the day, sewing machine operators engage in repetitious, repetitive elbow, wrist, and finger movements while doing laborious tasks at a rapid work rhythm. In addition to individual factors like age, experience, and physical fitness that further influenced the probability of musculoskeletal discomfort and LBP, prolonged repetitive jobs, poor ergonomics, and insufficient rest intervals exacerbated strain. Musculoskeletal pain symptoms increase workers' knowledge of their health by assisting them in identifying the type and severity of their pain. This knowledge encourages greater engagement at work, allowing people to successfully manage discomfort and sustain productivity while lowering the chance of developing new health issues. Ascertaining the prevalence of LBP among sewing machine workers was the aim of this study.

Methods:

This study is observational. was conducted on hundred People suffering from lower back pain in the population of sewing machine workers.

The study was carried through using a questionnaire. The questionnaire included a number of questions about sewing machine operators' employment status and LBP symptoms.

Result:

100 participants who participated in the study, of the sewing machine workers with LBP population. They answered a questionnaire. 73 (73%) individuals of the sewing machine users having high risk score for LBP while 27 (27%) participants had a low-risk score on the questionnaire.

Conclusion:

These results indicate that among sewing machine operators, the risk of low back pain is

the crucial factor.

Keyword: *Low back pain (LBP), Sewing machine operators, Musculoskeletal disorders (MSDs)*

1. INTRODUCTION

Musculoskeletal disorders (MSDs) are a major health concern among workers, particularly affecting millions of healthcare professionals. These conditions are the most commonly self-reported work-related diseases, leading to significant costs due to long-term disability, especially among the productive age group. Low back pain (LBP) is a critical clinical, social, economic, and public health issue, impacting individuals across their lifetime. It contributes to reduced work efficiency, increased absenteeism, and a lower quality of life, making it a pressing global health concern [4] [5]. The fragmentation of sewing machine operators work into repetitive tasks often results in operations that are monotonous, potentially hazardous, and complex, requiring precise coordination of both hands. These tasks are typically accomplished while sitting for long durations while performing typical tasks can result in physical strain. Operators frequently adopt a forward-leaning posture, inclining both their head and trunk, to maintain better focus and visual control over their work. This sustained posture can contribute to discomfort and ergonomic issues over time. Additionally, the nature of the work may require intense concentration and fine motor skills, further increasing physical and mental fatigue. The repetitive nature of these tasks, combined with prolonged static postures, may leads musculoskeletal discomfort as low back pain, reduced efficiency, and

an elevated risk of workplace injuries. As a result, proper ergonomic interventions, task rotation, and workplace modifications are essential to mitigate these risks, enhance worker safety, and improve overall productivity in such work environments [1].

Sewing machine workers had a higher prevalence of moderate to severe upper body musculoskeletal discomfort due to organizational and personal factors associated to their jobs. Prolonged repetitive tasks, poor ergonomics, and inadequate rest periods increased strain, while individual factors like age, experience, and physical fitness further influenced the possibility of low back pain and musculoskeletal discomfort [2]. Throughout the day, sewing machine operators engage in repetitious, repetitive elbow, wrist, and finger movements while doing laborious tasks at a rapid work rhythm [3] [6]. Their workstations are often in confined spaces, with workers seated closely behind tables that are not always ergonomically designed. This setup increases physical strain and discomfort over time. Additionally, operating riveting machines requires workers to adopt awkward postures, often forcing upper limb movements with raised shoulders. This unnatural positioning places excessive strain on the neck, shoulders, and upper and lower back, increasing the possibility of musculoskeletal disorders. The merging of repetitive motions, poor ergonomics, and prolonged static postures leads to discomfort, fatigue, and potential long-term health issues. Implementing ergonomic improvements, such as adjustable seating and workstation design, along with regular breaks and posture awareness, is essential to reducing strain and improving the overall well-being of sewing machine workers [3] [1].

Low back pain (LBP) is a significant public health issue, often linked to prolonged work without breaks, extended working hours, and poor posture. Studies indicates that working beyond eight hours a day, sitting in the same position for over two hours, and engaging in highly monotonous tasks significantly increase the possibility of neck and LBP. These factors contribute to musculoskeletal strain, leading to discomfort and reduced productivity. Preventive measures, including regular breaks, ergonomic adjustments, and posture awareness, are essential in mitigating the implications of low back pain [4] [5]. Musculoskeletal pain symptoms help workers recognize their pain's intensity and quality, raising awareness about their condition. This understanding promotes better work participation, enabling them to manage discomfort effectively and maintain productivity while decreasing the risk of further health complications [7].

METHOD

In this study which was observational, the individuals involved were exposed to particular outcomes and risk factors. To ascertain the prevalence of low back pain among sewing machine workers, a six-month study was carried out. In this study, all sewing machine operators having low back pain were enrolled.

Among 100 participants, we asked questions regarding the work status and symptoms associated to the low back pain.

INCLUSION CRITERIA

1) Occupation: Currently working as a sewing machine operator for at least 6 months
2) Work duration: Working for at least 4 hours a day, 5 days a week
3) Back pain symptom: experiencing back pain symptoms, such as pain, stiffness or discomfort in the back region.

EXCLUSION CRITERIA

1) Part time or temporary sewing machine operators
2) Participants with pre-existing back or musculoskeletal conditions unrelated to work
3) Previous back surgery; Having undergone back surgery in the past

Questionnaire:

This questionnaire incorporates questions regarding work status (Category 1), knowledge

(Category 2) and symptoms (Category 3). The overall questionnaire score was determined, from the responses to the 3 categories. scores from the first and second categories were positive if the responses indicated work status and knowledge, if there was symptoms regarding low back pain the third category score was positive. If a patient met two or more criteria, they were classified as high risk for LBP; if not, they were considered to be at moderate risk.

Questionnaire scoring

Scoring Questions: Any answer within the box outline is a positive response

Scoring Categories:

Category 1 is positive with 2 or more positive responses to questions 1-3

Category 2 is positive with 2 or more positive responses to questions 4-6

Category 3 is positive with 1 or more positive responses to questions 7-10

Final Results: 2 or more positive categories indicated a high risk of LBP. A questionnaire consisting of questions about participants work status and symptoms was used. This questionnaire consisted of 10 questions. The questions were explained to the participants before the filling of the questionnaire was carried out. The form was filling by participants and a consent form signature was taken. The study took place after approval was taken from the Institutional ethical committee of Krishna Vishwa Vidyapeeth "Deemed To Be University"

2. RESULTS

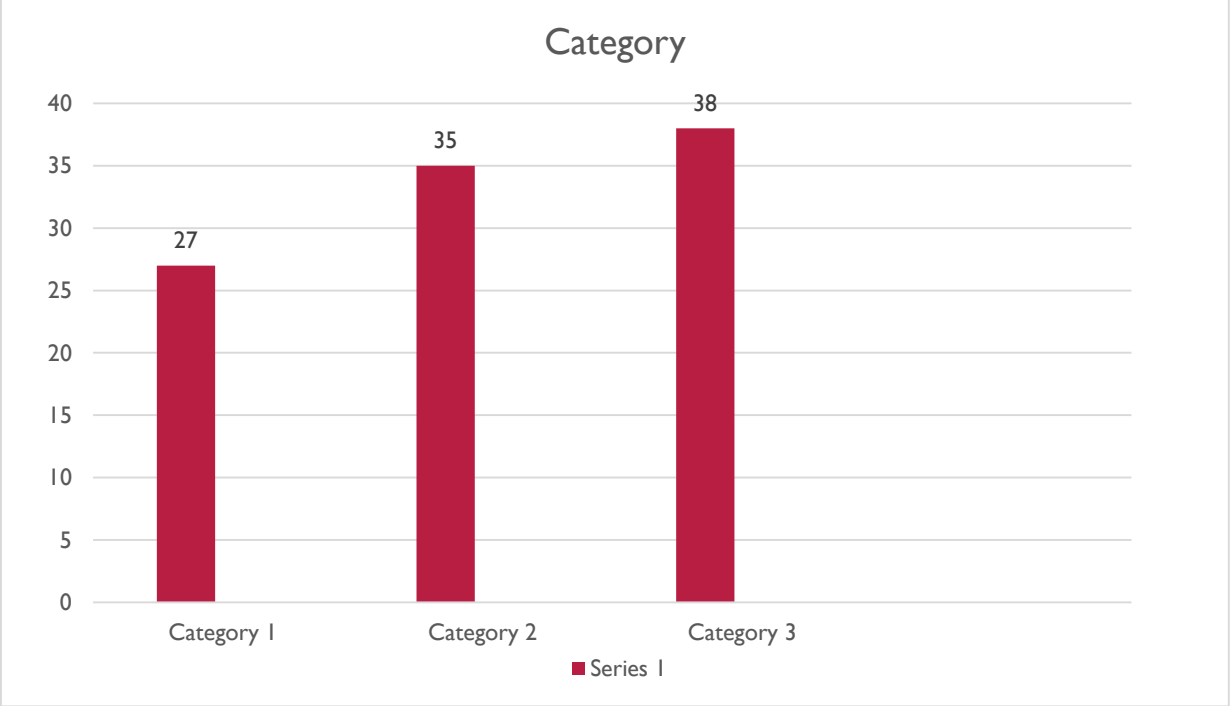
100 participants who participated in the convenient sampling survey, of the sewing machine worker population. They answered a questionnaire. The participants should be sewing machine user and having low back pain.

Scoring Categories:

Category 1 is positive with 2 or more positive response to question 1-3 = 27 participants are positive

Category 2 is positive with 2 or more positive response to question 4-6 = 35 participants are positive

Category 3 is positive with 2 or more positive response to question 7-10 = 38 participants are positive



GRAPH FIGURE 1: Scoring Categories

Of 100 participants,

27 (27%) had a positive response in category 1 of the questionnaire

35 (35%) had a positive response in category 2 of the questionnaire

38 (38%) had a positive response in category 3 of the questionnaire

3. DISCUSSION

Low back pain is a common musculoskeletal disorder, particularly among workers who engage in repetitive or prolonged postures. Sewing machine workers Represent a group that often face the possibility of developing back injuries because of the demands of their job, which often includes long hours of sitting, repetitive motions, and sometimes poor ergonomics. A study to evaluate the prevalence of low back pain among sewing machine users may offer important perspectives on improving workplace safety, designing better ergonomics, and developing preventive strategies.

Sewing machine operators are at risk for various musculoskeletal disorders (MSDs), including low back pain stemming from

the nature of their work. The principal factors influencing back sprain for sewing machine operators are Prolonged Sitting or Poor Posture, Awkward Body Positions, Heavy Lifting and Handling Materials, Vibration, Fatigue and Muscle Weakness, etc. Understanding the anatomy of the back and incorporating good ergonomic practices, posture habits and regular movement can greatly reduce the risk of strain and improve overall comfort during sewing. Sewing machine operators may not always be fully aware of how certain postures or repetitive motions contribute to back injuries. A study can promote awareness of these risks and encourage better practices, such as regular stretching, proper posture, and ergonomic awareness.

The other study conducted states that sewing machine operators include in the risk group with high prevalence of MSDs. Almost all the respondents reported pain at least in one body region in the past 12 months and most often in lower back, neck and wrist/hand. A relatively short duration of LBP (1–6 days) was noted by respondents and sick leave from one to five days was mentioned because of neck pain.

There is the growing need of study the prevalence of low back pain among sewing machine operators as it is essential for improving workplace conditions, enhancing worker health, reducing economic losses due to injuries, and ensuring the long-term sustainability of the workforce in the textile and garment industries. The findings can contribute to the creation of safer, more efficient working environments that protect both the workers and the companies that employ them. By conducting such study, we could gain Perspective about the degree of knowledge and awareness to reduce the risk that are associated to the LBP among sewing machine operators. This information Could be used to develop targeted interventions to improve LBP management among sewing machine operators.

4. CONCLUSION

Based on the sewing machine operators diagnosed with LBP criteria, 100 participants were assessed using the questionnaire. The prevalence of the suggestive diagnosis of risk of low back pain among sewing machine operators was 73%. These findings indicate that the risk of low back pain is the important factor among the sewing machine operators.

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