CASE STUDY OF LOW BACK PAIN AMONG MANUAL MATERIAL HANDLING WORKERS AT NGEMPLAK MARKET TULUNGAGUNG REGENCY

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ABSTRACT

Low back pain is one of the most common musculoskeletal disorders experienced by manual material handling workers, especially workers who frequently lift heavy loads in traditional markets. This study aimed to analyze cases of low back pain among manual material handling workers at Ngemplak Market, Tulungagung Regency. This study used a qualitative case study design involving five workers, one supporting informant, and one key informant selected through purposive sampling. Data were collected using observation, structured in depth interviews, and documentation. The findings showed that workers routinely lifted loads ranging from 40–150 kilograms with long working durations, non ergonomic body posture, irregular rest periods, and minimal warming up habits before work activities. Most workers experienced low back pain after work but considered it a normal occupational consequence. Workers generally relied on rest, massage, and self medication instead of medical treatment. The study concludes that ergonomic practices and heavy lifting significantly contribute to low back pain.

Keywords : *Ergonomics, Low Back Pain, Manual Handling, Occupational Health*

INTRODUCTION

Ngemplak Wholesale Market is the only central market in Tulungagung Regency that operates for 24 hours a day. Established in 1990, this market is the result of the merger between the Morning Market and the Afternoon Market in Tulungagung Regency. As one of the busiest traditional markets in the area, various informal sector occupations can be found in this market, including pelvic coolie workers who provide manual goods transportation services. Their activities involve carrying goods from one place to another using physical strength, making this occupation highly dependent on manual handling activities.

Manual handling refers to activities such as lifting, lowering, pushing, pulling, holding, carrying, or moving loads using one or both hands and the entire body. These activities often require repetitive movements, awkward working postures, and excessive physical exertion, which may increase the risk of work-related injuries and musculoskeletal disorders. In many cases, prolonged manual handling tasks can lead to decreased work efficiency, excessive fatigue, and physical health problems among workers.

Pelvic coolie workers are part of the informal workforce and commonly perform physically demanding tasks without adequate ergonomic support or sufficient rest periods. The nature of their work exposes them to high physical workloads that may affect their health and occupational safety. Previous studies have shown that workload must be balanced with workers' physical and cognitive capacities to prevent occupational health problems. However, in traditional market settings, workers often continue working under strenuous conditions due to economic demands and lack of occupational health awareness.

One of the most common health complaints associated with manual handling work is low back pain (LBP). Low back pain is a musculoskeletal disorder frequently experienced by workers who perform repetitive lifting and carrying activities. Continuous exposure to improper body posture and heavy loads may increase pressure on the lower back muscles and spine, leading to pain and discomfort that can interfere with daily activities and work productivity.

Based on a preliminary study conducted at Ngemplak Market, Tulungagung Regency, interviews with five pelvic coolie workers revealed that they frequently experienced lower back pain after carrying heavy loads repeatedly throughout the day. The workers reported that inadequate rest time and continuous manual handling activities contributed significantly to their physical discomfort. These conditions indicate the presence of occupational health risks among pelvic coolie workers that require further attention and investigation.

Therefore, this study aims to analyze cases of low back pain among pelvic coolie workers at Ngemplak Market, Tulungagung Regency. The findings of this study are expected to provide useful information regarding occupational health risks in informal sector workers and contribute to efforts in improving workplace health and safety practices among manual handling workers.

METHODS

This study used a qualitative research design with a case study approach to explore low back pain complaints among pelvic coolie workers at Ngemplak Market, Tulungagung Regency. The study was conducted at Ngemplak Market starting from February 2025. The qualitative approach was chosen to obtain in-depth information regarding workers' experiences, manual handling activities, and factors contributing to low back pain complaints. The main variable

examined in this study was low back pain among pelvic coolie workers, particularly related to manual handling activities and warming-up habits before work. Supporting variables included work posture, lifting activities, workload, and rest periods.

The population in this study consisted of pelvic coolie workers at Ngemplak Market, Tulungagung Regency. The sampling technique used was purposive sampling because the researcher considered that the selected informants had the best understanding of the problems being studied. Sampling was carried out until data saturation was achieved. The informants in this study consisted of pelvic coolie workers and employees of the Technical Implementation Unit (UPT) of Ngemplak Market, Tulungagung Regency. These informants were expected to provide broad and in-depth information related to occupational activities and complaints of low back pain experienced by workers.

Data collection was conducted through qualitative observation and structured in-depth interviews using interview guidelines prepared by the researcher. Observations were carried out to examine work activities, body posture, and manual handling practices performed by workers. During the interviews, the researcher recorded all responses from informants objectively using written notes and mobile phone recordings. The interview instrument was specifically designed to explore complaints of low back pain experienced by pelvic coolie workers, including work habits, lifting techniques, duration of work, and warming-up activities before starting work.

Data analysis in this study used an interactive qualitative analysis model. The analysis process included observing workers' activities, conducting interviews, transcribing interview results, identifying important statements, categorizing data into related themes, and interpreting the findings systematically according to the research objectives. The researcher also reviewed the relevance of the collected data from observations, interviews, and documentation before compiling the findings into a final report. Ethical principles were applied throughout the study by obtaining voluntary consent from participants and maintaining confidentiality and anonymity.

RESULTS AND DISCUSSION

The findings of this study show that low back pain is a common complaint among pelvic coolie workers at Ngemplak Market, Tulungagung Regency. Most workers perform manual material handling activities repeatedly every day with heavy loads ranging from 40–150 kilograms (kg). Workers generally carry sacks, vegetable crates, and other market goods manually using improper body posture and without ergonomic support. The duration of work also tends to be long, ranging from 4–12 hours per day. Based on interviews and observations, workers frequently experience low back pain after lifting heavy loads, especially after prolonged work activities. Most informants stated that the pain was considered a normal consequence of their occupation rather than a serious health problem.

The results also indicate that warming-up habits before work are still very limited among workers. Four out of five pelvic coolie workers reported that they did not perform stretching or warming-up before starting work because they were already accustomed to heavy physical activities. Only one informant routinely performed simple warming-up exercises to prevent muscle stiffness and back pain. Workers usually started work immediately after arriving at the market without any preparation, mainly due to time demands and work routines. Observations from supporting informants and the market management also confirmed that warming-up activities were rarely practiced among pelvic coolie workers.

Another important finding is related to the workers' responses toward low back pain complaints. Most workers did not seek medical treatment even though they experienced recurring pain. Instead, they preferred self-treatment methods such as resting, drinking large amounts of water, taking over-the-counter medicine, or receiving traditional massage therapy. Workers tended to normalize pain as part of their daily occupational activities. In addition, the market management had not provided occupational health programs, ergonomic training, or routine medical examinations for pelvic coolie workers. Preventive measures implemented by the market management were still limited to reducing the weight of vegetable loads carried by workers.

The findings indicate that repetitive manual handling activities with heavy loads contribute significantly to low back pain complaints among pelvic coolie workers. Heavy lifting activities ranging from 40–150 kg exceed recommended ergonomic limits and place excessive pressure on the spinal structure and lower back muscles. Continuous lifting with non-ergonomic body posture and long working hours may increase the risk of musculoskeletal disorders, especially low back pain. These findings are consistent with previous studies showing that manual material handling activities are strongly associated with low back pain among informal workers and laborers.

The absence of warming-up activities before work may also increase the risk of muscle strain and back injuries. Most workers considered warming-up unnecessary because they had become accustomed to physical labor. However, one worker who routinely performed warming-up exercises reported fewer complaints during work activities. This finding suggests that simple preventive measures such as stretching and warming-up may help reduce muscle tension and improve physical readiness before heavy work activities. Similar studies have reported that warming-up exercises can improve muscle flexibility and reduce the risk of musculoskeletal complaints among workers performing repetitive physical activities.

Another important issue identified in this study is the normalization of pain among informal workers. Most pelvic coolie workers perceived low back pain as a natural consequence of work and therefore rarely sought professional medical treatment. Instead, they relied on traditional massage, rest, and self-medication to relieve symptoms. This condition may delay proper treatment and potentially worsen musculoskeletal disorders over time. Similar findings have been reported in previous occupational health studies where informal workers often underestimate work-related pain due to economic pressures and limited health awareness.

The study also reveals limited occupational health support from the market management. Although efforts have been made to reduce excessively heavy loads, there are still no formal occupational health programs, ergonomic training, or regular health examinations for pelvic coolie workers. This situation indicates that occupational health protection for informal sector workers remains inadequate. Therefore, preventive interventions such as ergonomic education, stretching programs, workload regulation, and routine medical check-ups are needed to reduce the risk of low back pain and improve the occupational health and safety of pelvic coolie workers at Ngemplak Market.

Discussion

The results of this study indicate that low back pain is a common occupational health complaint among pelvic coolie workers at Ngemplak Market, Tulungagung Regency. Most workers experience low back pain due to heavy manual lifting activities, long working durations, non-ergonomic body posture, and the lack of warming-up habits before work. The workers routinely lift loads ranging from 40–150 kilograms (kg), which exceeds the recommended ergonomic lifting limit for adult workers. According to the Decree of the Minister of Manpower

No. Per.01/MEN/1978, the recommended maximum lifting load for adult male workers is 40 kg for occasional lifting and 15–18 kg for repetitive lifting. These findings support the ergonomic theory stating that repetitive manual material handling activities place excessive mechanical pressure on muscles, ligaments, joints, and the spinal structure, increasing the risk of musculoskeletal disorders, especially low back pain. This finding is consistent with previous studies conducted by Pradana (2023) and Harrianto (2010), which reported that repetitive heavy lifting activities can cause muscle fatigue, inflammation, and long-term degeneration of musculoskeletal tissues.

The study also found that working duration and inadequate rest periods contribute to low back pain complaints among workers. Several informants reported working between 4–12 hours per day with irregular rest periods depending on customer demand and market activity. Workers generally experience pain after work activities rather than during lifting tasks. This condition may indicate delayed onset muscle soreness (DOMS) caused by muscle fatigue accumulation after prolonged physical activity. According to WHO (2015), approximately 15–25% of low back pain cases are associated with prolonged non-ergonomic working postures and repetitive physical work activities. In addition, older workers above 40 years old remain involved in heavy lifting activities despite age-related physiological decline. Bridger (2003) explained that individuals over the age of 30 gradually experience reduced tissue elasticity and spinal degeneration, increasing their vulnerability to low back pain. In the researcher's opinion, the workers' long-term adaptation to heavy work does not indicate the absence of health risks, but rather reflects the normalization of pain as part of their occupational routine.

Another important finding in this study is the lack of warming-up habits among pelvic coolie workers. Most informants reported directly starting work without performing stretching or warming-up exercises because they considered themselves accustomed to physical labor. Only one worker consistently performed simple stretching before work and reported fewer complaints of muscle stiffness and back pain. This finding is in line with the study conducted by Handayani and Kusuma (2020), which stated that informal workers often neglect occupational health practices due to productivity demands and work habits. According to Minematsu (2012) in Putriastuti (2017), warming-up activities improve blood circulation, increase muscle flexibility, and reduce the risk of musculoskeletal injury. The researcher believes that low awareness regarding ergonomics and occupational health remains one of the main factors contributing to low back pain among pelvic coolie workers. Workers tend to perceive pain as a normal consequence of work rather than as an early warning sign of musculoskeletal disorders.

This study also highlights the limited occupational health support available for pelvic coolie workers. Most workers rely on self-treatment methods such as rest, drinking water, traditional massage, or over the counter medication instead of seeking medical care. Furthermore, the market management has not yet implemented occupational health programs, ergonomic training, or routine medical examinations for workers. Preventive efforts are still minimal and mostly reactive when workplace accidents occur. In the researcher's opinion, this condition demonstrates the need for comprehensive occupational health interventions in the informal sector. Preventive strategies such as ergonomic education, routine stretching programs, workload limitation, adequate rest periods, and the provision of simple transportation tools such as trolleys are necessary to reduce the risk of low back pain among workers. If these interventions are implemented consistently, they may help improve workers' health, reduce musculoskeletal

complaints, and enhance productivity and quality of life among pelvic coolie workers at Ngemplak Market, Tulungagung Regency.

CONCLUSION

Based on the results of this case study, low back pain is identified as a common occupational health problem among pelvic coolie workers at Ngemplak Market, Tulungagung Regency. The findings reveal that the main contributing factors include heavy lifting loads ranging from 40–100 kilograms (kg), long working durations without adequate rest periods, non-ergonomic working postures, and the lack of warming-up habits before work activities. Most workers perform repetitive manual material handling activities daily, which increases mechanical stress on the lower back muscles and spinal structures. Although many workers consider low back pain a normal consequence of their occupation, this condition indicates a significant risk of long-term musculoskeletal disorders that may reduce work productivity and quality of life. The study also finds that workers generally rely on traditional treatments such as massage, rest, and self-medication instead of seeking professional medical care, while occupational health support and ergonomic interventions in the workplace remain limited. These findings strengthen the hypothesis that repetitive heavy lifting activities, poor ergonomic practices, and inadequate preventive behaviors are closely associated with the occurrence of low back pain among informal manual workers.

Therefore, several recommendations are proposed based on the findings of this study. Pelvic coolie workers are encouraged to adopt healthier work habits such as performing warming-up and stretching exercises before work, applying ergonomic lifting techniques, and taking regular rest periods during work activities. Workers are also advised to undergo routine medical examinations instead of relying solely on traditional massage or self-medication to manage pain symptoms. For the management of Ngemplak Market, greater attention should be given to occupational health and safety by providing ergonomic education, encouraging stretching activities before work, regulating workload limits, and providing simple transportation tools such as trolleys to reduce physical strain on workers. In addition, future researchers are recommended to conduct studies with larger sample sizes and more comprehensive data collection methods, including direct ergonomic observations and medical examinations. Further studies may also focus on evaluating intervention programs such as ergonomic training, stretching programs, and assistive lifting devices to identify effective strategies for preventing musculoskeletal disorders among informal workers.

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