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Occupational Health Hazards Of Prolonged Standing In Female Canteen Workers Of Belthangady Taluq, Dakshina Kannada District, Karnataka

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ABSTRACT

Prolonged standing poses a significant occupational health risk for female canteen workers, leading to musculoskeletal disorders (MSDs). This study examines the prevalence of MSDs among 60 workers in Belthangady Taluq, Karnataka, using the Nordic Musculoskeletal Questionnaire (NMQ) and chi-square analysis. Results show high incidences of ankle/foot pain (85%) and lower back pain (75%), with significant correlations to work experience and standing duration. Many workers rely on home remedies and seek medical care only when the pain becomes unbearable. The study highlights the need for ergonomic interventions, structured rest breaks, physiotherapy, and dietary adjustments to improve worker well-being.

Keywords— Occupational Health, Prolonged Standing, Musculoskeletal Disorders, Ergonomics, NMQ.

I.INTRODUCTION

Prolonged standing is widely recognized as an occupational hazard contributing to musculoskeletal disorders (MSDs) among workers in various sectors (Tüchsen et al., 2005). Studies indicate that standing for extended periods without adequate rest breaks leads to increased pressure on the lower limbs, resulting in chronic pain and fatigue (Messing & Kilbom, 2001). Female canteen workers, in particular, are at a higher risk due to prolonged exposure to physical strain in cooking and serving environments. Working 10–12 hours daily, six days a week, with minimal breaks, significantly impacts their musculoskeletal health, leading to issues such as lower back pain, knee pain, foot discomfort, neck stiffness, and shoulder strain. These conditions not only affect their physical well-being but also impair their overall quality of life.

Despite experiencing chronic pain, most workers do not seek professional medical assistance, relying instead on home remedies such as hot water therapy and pain relief balms. Their condition worsens as they continue household chores without adequate rest. Socioeconomic factors, lack of ergonomic awareness, and financial constraints contribute to their reluctance to seek proper healthcare, making interventions necessary to improve workplace conditions (Cai et al., 2019).

This study aims to analyze the impact of prolonged standing on the health of female canteen workers in Belthangady Taluq, Dakshina Kannada district of Karnataka, using the Nordic Musculoskeletal Questionnaire (NMQ) and statistical analysis methods such as the chi-square test. It assesses their demographic profile, working conditions, and health issues, while also identifying coping mechanisms they employ to manage pain. Although many workers express satisfaction with their salaries and modern kitchen facilities, their musculoskeletal health remains a significant concern.

OBJECTIVES

1. To assess the demographic profile of female canteen workers.
2. To evaluate the impact of prolonged standing on musculoskeletal health.
3. To analyse the prevalence of MSDs using NMQ analysis.
4. To identify coping mechanisms used by workers to manage pain and discomfort.
5. To conduct a chi-square test to examine associations between MSDs and workrelated factors.

II. METHODOLOGY

2.1 Study Design

A cross-sectional study was conducted among 60 female canteen workers in Belthangady Taluq, Karnataka, employing a mixed-method approach, incorporating structured questionnaires, NMQ analysis, and workplace observations.

2.2 Sample Selection

Sample Size: 60 female canteen workers.

Inclusion Criteria: Women engaged in cooking and serving duties are only taken into consideration.

2.3 Data Collection

Structured Questionnaire: Captured demographic data, work hours, physical discomfort, and health-seeking behavior.

Nordic Musculoskeletal Questionnaire (NMQ): Assessed MSD prevalence in the lower back, shoulders, arms, legs, ankles, and feet.

Observations: Evaluated workplace ergonomics, work postures, and rest breaks.

2.4 Statistical Analysis

Descriptive Statistics: Used to summarize demographic data and work conditions.

Chi-Square Test: Conducted to assess associations between MSDs and variables such as work experience, and daily standing duration.

III. RESULTS AND DISCUSSION

3.1 Prevalence of MSDs (NMQ Analysis Results)

. Table 1: NMQ analysis results

MSDs	Percentage
Lower Back Pain	75%
Shoulder Pain	60%
Arm Pain	50%
Leg Pain	55%
Ankle/Foot Pain	85%

The Nordic Musculoskeletal Questionnaire (NMQ) analysis revealed a high prevalence of musculoskeletal disorders (MSDs) among female canteen workers, with ankle/foot pain (85%) being the most reported issue. Lower back pain (75%) was also highly prevalent due to prolonged standing and poor posture. Shoulder pain (60%) and arm pain (50%) were linked to repetitive upper-body movements, including lifting, stirring, and frequent hand motions. Leg pain (55%) resulted from extended standing hours, leading to fatigue and circulation issues. These findings highlight the urgent need for structured rest breaks and preventive measures to reduce MSD risks.

3.2 Chi-Square Test Results

The chi-square test revealed significant associations between MSD prevalence and work-related factors. The results showed a strong correlation between work experience and MSDs, as well as a significant relationship between prolonged standing hours and MSD prevalence. These findings indicate that both work experience and extended standing durations play a crucial role in the development of MSDs among

workers.

3.3 Coping Mechanisms

Female canteen workers often rely on various coping mechanisms to manage musculoskeletal disorders (MSDs) and the discomfort caused by prolonged standing. Due to financial constraints and lack of medical awareness, many workers self-manage their symptoms rather than seeking professional medical advice.

Home Remedies

The majority of workers prefer using traditional home remedies for pain relief. Hot water therapy, such as soaking the feet or applying warm compresses, is commonly used. Many workers also rely on topical pain relief balms and herbal drinks, such as hot water mixed with turmeric powder and jeera (cumin), to help reduce pain and inflammation.

Medical Consultation

Despite experiencing chronic pain and fatigue, 75% of the workers initially sought professional medical help. However, due to the recurrence of pain, the majority eventually stopped consulting medical professionals. They only seek medical attention when the pain becomes unbearable and no other options remain.

3.4 Ergonomic and Holistic Interventions

To mitigate the impact of prolonged standing and reduce the prevalence of MSDs, various ergonomic and holistic interventions can be incorporated into the workplace. These interventions focus on improving posture, reducing joint stress, and enhancing musculoskeletal health through a combination of ergonomic modifications, physiotherapy, Ayurvedic treatments, dietary adjustments, and yoga.

A. Ergonomic Improvements

1. Anti-Fatigue Mats:

Providing anti-fatigue mats in workstations can help distribute pressure evenly on the feet, reducing strain on the lower limbs. Studies have shown that using such mats significantly reduces discomfort and fatigue in workers who stand for prolonged periods (King, 2002).

2. Supportive Footwear:

Encouraging the use of ergonomic footwear with cushioned soles and arch support can minimize foot and ankle pain. Research indicates that proper footwear reduces the risk of plantar fasciitis and varicose veins among standing workers (Chander et al., 2016).

3. Structured Breaks:

Implementing micro-breaks every two hours allows workers to stretch and relieve pressure on their lower limbs, promoting better circulation and reducing muscle fatigue (Tissot et al., 2009).

B. Physiotherapy and Exercise

Regular physiotherapy sessions and targeted exercises can significantly improve muscle endurance and flexibility, reducing the likelihood of chronic MSDs.

1. **Stretching Routines:**

Daily stretching exercises focusing on the lower back, calves, and shoulders can improve flexibility and joint mobility. Stretching is crucial for preventing stiffness and maintaining muscle elasticity (Nelson et al., 2010).

2. **Strengthening Exercises:**

Exercises targeting core stability and lower limb strength (e.g., squats, leg raises, and isometric holds) help reduce postural strain and enhance endurance in physically demanding jobs (Apostoli et al., 2012).

C. Ayurvedic Remedies

Ayurvedic treatments have been widely recognized for their effectiveness in managing chronic musculoskeletal pain. Specific herbal formulations and oils can aid muscle relaxation, reduce inflammation, and improve circulation.

1. **Ashwagandha (Withania somnifera):**

Known for its adaptogenic properties, Ashwagandha helps strengthen muscles, reduce stress-induced inflammation, and improve endurance. Research suggests that Ashwagandha supplementation significantly enhances muscle recovery (Kulkarni et al., 2017).

2. **Mahanarayan Taila:**

This medicated oil, used for therapeutic massage, contains anti-inflammatory herbs that relieve joint

stiffness and muscular pain. Ayurvedic practitioners recommend its use for chronic MSD conditions (Sharma et al., 2018).

3. Dashmool Kwath:

A herbal decoction made from ten medicinal roots, Dashmool Kwath is effective in reducing muscle inflammation and improving mobility (Patwardhan et al., 2019).

D. Diet and Nutrition

A well-balanced diet plays a crucial role in maintaining bone and muscle health. Proper nutrition enhances recovery, prevents deficiencies, and reduces inflammation.

1. Calcium-Rich Foods:

Consumption of dairy products (milk, curd), sesame seeds, and leafy greens supports bone strength and reduces the risk of osteoporosis in physically demanding occupations (Karp et al., 2016).

2. Anti-Inflammatory Spices:

Spices like turmeric and ginger contain potent anti-inflammatory compounds (curcumin and gingerol) that help in reducing joint pain and muscle inflammation (Gupta et al., 2013).

E. Yoga and Meditation

1. Posture Correction Techniques:

Yoga postures such as Tadasana (Mountain Pose), Bhujangasana (Cobra Pose), and Vajrasana (Kneeling Pose) help correct spinal alignment and prevent lower back pain (Goyeche et al., 2014).

2. Joint Mobility Exercises:

Gentle yoga-based stretches focusing on the ankles, knees, and shoulders enhance joint flexibility, reducing the risk of stiffness in prolonged standing jobs.

3**. Pranayama (Breathing Exercises):**

Breathing techniques like Anulom Vilom and Bhastrika promote oxygenation and relaxation, reducing stress-induced muscle tension (Brown & Gerbarg, 2005).

IV. CONCLUSION

Prolonged standing among female canteen workers is a significant occupational health concern, contributing to musculoskeletal disorders. The NMQ analysis and chi-square test confirmed a strong association between work experience, standing hours, and MSD prevalence. The most effective and accessible remedies include taking regular breaks, maintaining a proper diet, and incorporating stretching exercises. Even beginners can adopt physiotherapy as a preventive measure to reduce the risk of future MSDs.

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