

Prevalence of Musculoskeletal Discomfort in Females Due to Preparations of Diwali Festivities: A Cross-Sectional Study

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Abstract

Introduction-Women who handle household tasks are at higher risk for musculoskeletal disorders (MSDs) due to repetitive movements, strain, and poor ergonomics. Activities like cleaning and cooking can cause pain in the back, neck, wrists, and knees, especially without proper rest and posture. Moreover, these activities are increased during festivities in Indian households; especially for females. Diwali, being one of the biggest and most important festivals throughout the country, brings extra joy as well as the burden of extra household activities like cleaning, decorating, shopping, renovating homes etc. As there is limited literature on the impact of Diwali preparation on musculoskeletal health of females.

Objectives-Aim of the study is to find the prevalence of Musculoskeletal discomfort in females due to preparations during Diwali festivities.

Methodology- A total of 134 females (>20 years) were interviewed as part of a cross-sectional study. Questions for the interview assessed musculoskeletal discomfort related to Diwali preparations. Data included demographics, work details, self-reported discomfort, posture and sleep issues.

Results – Musculoskeletal discomfort was prevalent across various age groups, with common issues in the neck, back, and lower limbs. Overall 82, 63, 62 and 52 participants had discomfort in lower back, upper back, neck and shoulder, respectively. Moreover, Full-time job participants reported discomfort in the lower back (66%), foot (60%), neck (57%) and upper back (54%), Part-time job participants had higher discomfort in the lower back (85%), neck (62%), upper back (54%). Furthermore, work-from-home participants mainly reported knee and lower leg discomfort (50%). Additionally, in homemakers lower back (63%) and lower leg (52%) discomfort were most common.

Conclusion – This study concludes that lower back pain was the most frequent issue across all groups, with part-time job participants experiencing the highest rate of discomfort.

Keywords - Musculoskeletal discomfort, Female, Diwali, Lower Back ,Upper Back, Neck, Shoulder.

INTRODUCTION

According to the World Health Organization (WHO) Musculoskeletal disorder (MSD) is “a disorder of the muscles, tendons, peripheral nerves or vascular system not directly resulting from an acute or instantaneous event”.^[1] Musculoskeletal conditions have the 4th greatest impact on the overall health of the world population, affecting more than 1.7 billion people worldwide which results in increasing overall rate of disability.^[2]

Musculoskeletal disorders (MSDs) affect muscles, bones, tendons, ligaments, and nerves, causing pain, inflammation, and limited mobility. They can result from overuse, injury, or aging and include conditions like tendonitis, carpal tunnel syndrome, and osteoarthritis. MSDs are classified as specific (with clear causes) or non-specific (with unclear causes). Work-related MSDs (WRMSDs) arise from repetitive, forceful, or prolonged movements, especially in poor ergonomic conditions, and are common in jobs involving high repetition or awkward postures.^[3,4]

Research indicates that musculoskeletal pain is more common in women than men, both in the general and working populations. Exploring sex differences in musculoskeletal pain is essential for developing more effective prevention and treatment strategies for both genders.^[5]

Musculoskeletal discomfort is a widespread issue affecting women across various occupations, whether they are employed in professional settings or managing the responsibilities of a household. Both groups may also struggle with similar challenges related to posture, stress, and fatigue. This affects both working women and housewives, though the causes and specific symptoms may vary. For working women, sedentary or physically demanding jobs can lead to back, neck, and joint pain, while housewives face similar discomfort from repetitive tasks and the physical demands of managing a household. Prolonged sitting, improper lifting techniques, and repetitive tasks can lead to back pain, neck stiffness, tendinitis, and other musculoskeletal issues.

Diwali is a major festival in India and is celebrated with great enthusiasm and fervor. While Diwali is a time for celebration, it's important to recognize the extra strain it can place not only on working women but also on housewives. Preparing for Diwali can be physically demanding, especially for those females who are already experiencing musculoskeletal (MSK) discomfort as they often bear extra burden of the household chores during the festive season.. Tasks such as cleaning, decorating and cooking often aggravate issues like joint pain, back stiffness, and muscle fatigue.

NEED OF THE STUDY

During Diwali, women often engage in physically demanding tasks that can strain muscles and joints, worsening existing musculoskeletal issues. Repetitive activities like bending, lifting, and standing for long periods increase the risk of pain and injury, especially without proper ergonomics. This generates the need to explore the effect of traditional celebrations like diwali on the musculoskeletal system in women. Thus, highlighting the need for gender-sensitive health awareness.

Furthermore, there are many studies which focus on general musculoskeletal disorders, however, there is limited research on how specific cultural events like Diwali impact musculoskeletal health in women. Hence, this study connects cultural practices with health outcomes, especially highlighting the risks to women's physical well-being during culturally significant and physically demanding events.

Hence, this study focuses on finding out the prevalence of musculoskeletal discomfort in females due to preparations of Diwali festivities. This can help in designing specific health interventions and preventive measures to reduce the impact of these disorders, such as ergonomic training or health guidelines during festivals.

RESEARCH METHODOLOGY

MATERIAL:

1. Participant Information form
2. Interview form

TOOLS USED:

Interviews were taken based on following Questionnaires-

1. Nordic Musculoskeletal Questionnaire
2. Cornell Musculoskeletal Discomfort Questionnaire

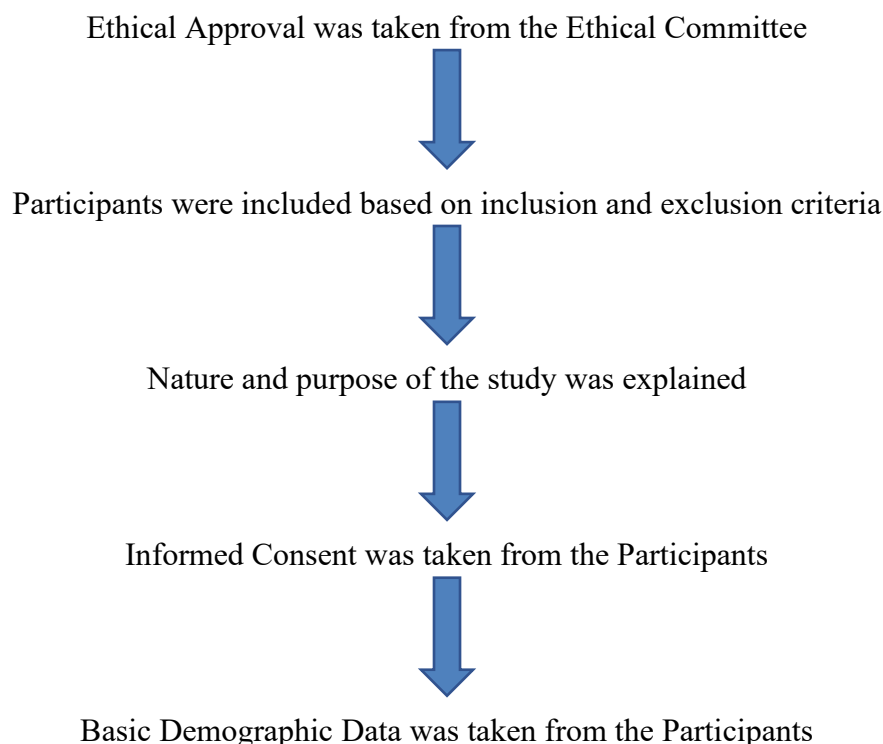
(The above Questionnaires were taken as reference for forming the interview questions.)

METHODOLOGY:

1. Study Design- Cross-Sectional Study
2. Study duration- 1 Month
3. Study Setting- Different Communities
4. Study Technique – Purposive Sampling
5. Sample Size – 134 participants
6. Study Population – Women with age 20 or above

INCLUSION AND EXCLUSION CRITERIA:

134 participants were selected based on the inclusion and exclusion criteria. Females of greater than 20 years who were willing to participate and irrespective of their occupation were included in the study. Additionally, housewives with or without help of maidservant were also incorporated in the study. The exclusion criteria were: females with a history of recent surgery; pregnant women as well as those with severe musculoskeletal conditions. Also, females with recent neurosurgical procedures or neurological disorders; and those with severe cardiovascular or respiratory conditions were excluded from the study.

PROCEDURE:



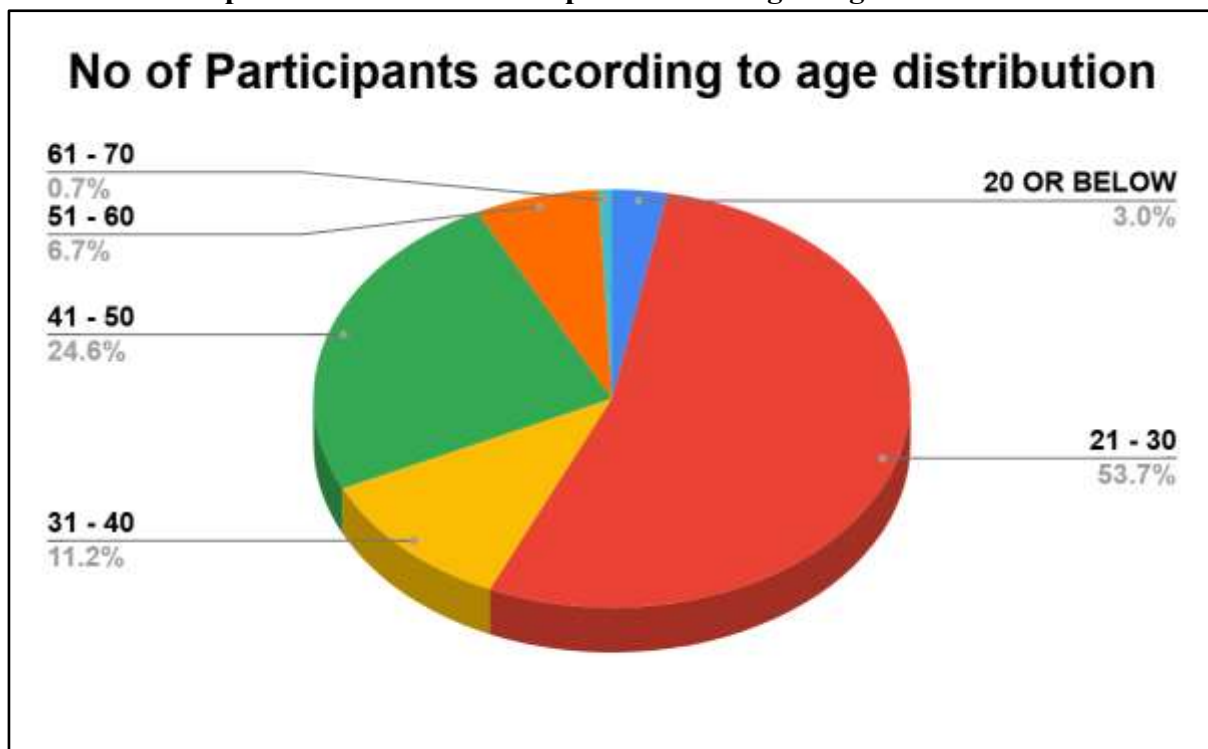
Participants were asked for duration of extra household work, Days of extra household work, sleep disturbances, area (site) and side of discomfort, intensity of discomfort, rest period duration, walking interference, physical exercise and its duration, rating the pain.

Analysis was done

RESULTS:

Graph-1 shows age distribution of participants. Maximum number of participants (72) were in the age group of 21-30 years. 15, 33, 9, 1 and 4 participants were in age group of 31-40, 41-50, 51-60, 61-70 and below 20 years, respectively.

Graph 1 – Number of Participants according to Age Distribution



Graph – 2 shows Prevalence of Musculoskeletal discomfort in different body parts. The data showed that musculoskeletal discomfort was felt by 61% (82) participants in the lower back, 47% (63) participants in the upper back, and 46% (62) participants in the neck, 39% (52) participants in the shoulder. 28% (37) of participants in the upper arm, 30% (40) of participants in the forearm. 29% (39) of participants in the wrist, 15% (20) of participants in hips/buttocks, 18% (24) of participants in thigh and knee, 17% (23) of participants in lower leg and foot.

Graph 2 -Prevalence of Musculoskeletal discomfort in different areas of body

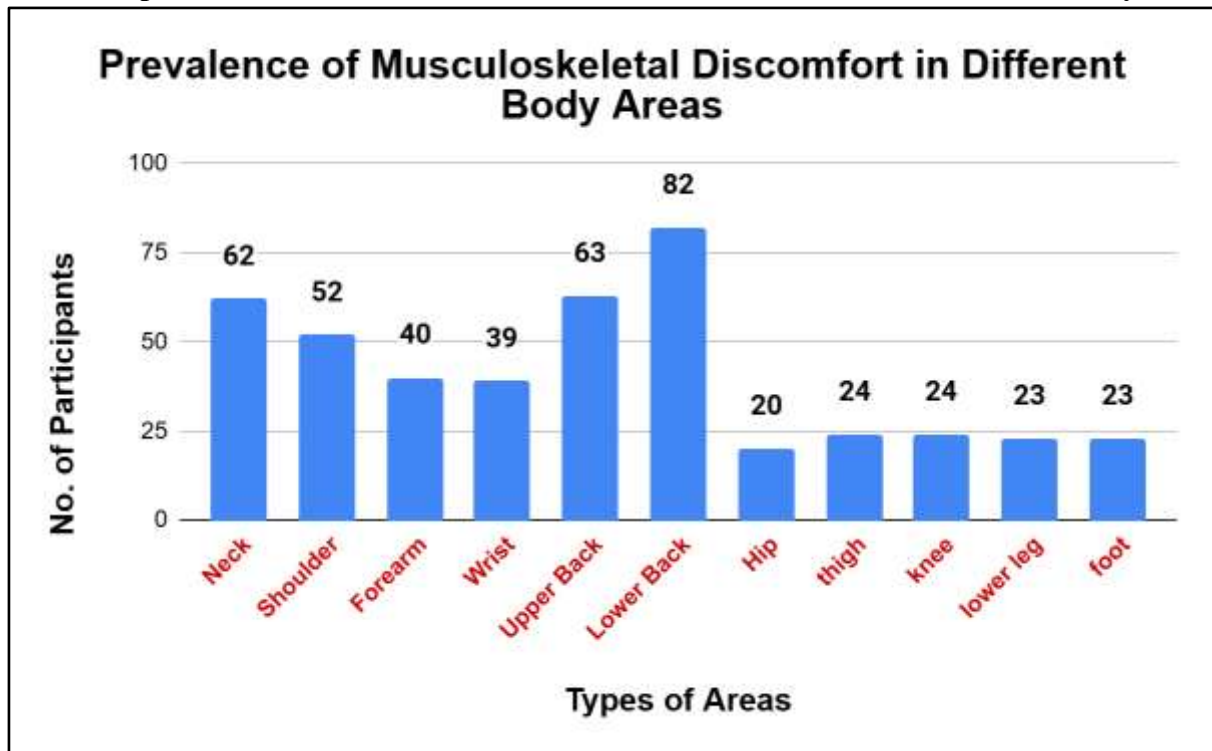
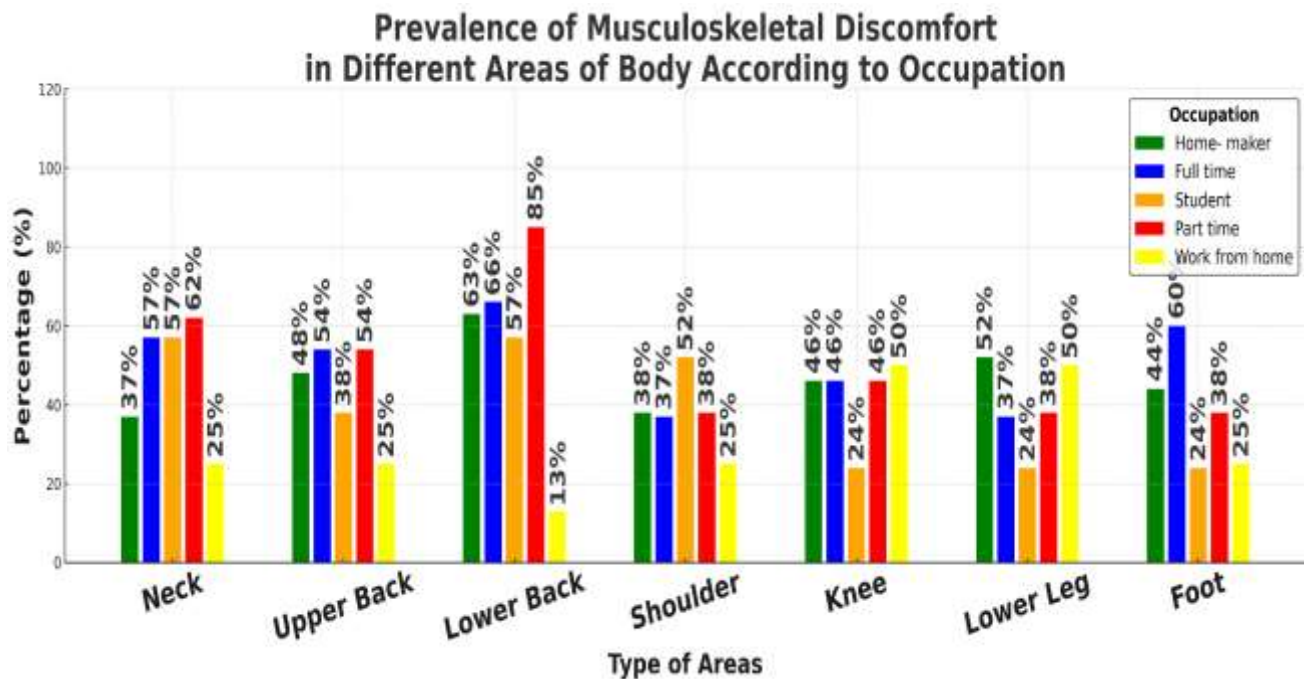


Table 1 shows Prevalence of Pain in different areas according to the Occupation. Musculoskeletal discomfort was prevalent across various groups, with common issues in the neck, back, and lower limbs. Full-time job participants reported discomfort in the lower back (66%), and foot (60%), neck (57%), upper back (54%), Part-time job participants had higher discomfort especially in the lower back (85%), neck (62%), upper back (54%), and. Work-from-home participants mainly reported knee and lower leg discomfort (50%). Among homemakers, lower back (63%) and lower leg (52%) discomfort were most common. Students experienced neck (57%), lower back (57%), and shoulder (52%) discomfort. Overall, lower back pain was the most frequent issue across all groups, with part-time job participants experiencing the highest rate of discomfort.

Table-1 Prevalence of Pain in different areas according to the occupation

Occupation	N	Neck	Upper Back	Lower Back	Shoulder	Knee	Lower Leg	Foot
Home- maker	52	37%	48%	63%	38%	46%	52%	44%
Full time	35	57%	54%	66%	37%	46%	37%	60%
Student	21	57%	38%	57%	52%	24%	24%	24%
Part time	13	62%	54%	85%	38%	46%	38%	38%
Work from home	8	25%	25%	13%	25%	50%	50%	25%

GRAPH 3 -Prevalence of Musculoskeletal Discomfort in different areas of Body according to Occupation



DISCUSSION

Diwali is a major Hindu festival celebrated by millions around the world. It marks the victory of light over darkness and good over evil. Diwali involves lighting oil lamps, bursting fireworks, decorating homes, exchanging gifts, and sharing festive meals. It typically spans five days, with the third day being the most significant, dedicated to worshipping Goddess Lakshmi, the goddess of wealth. The festival fosters joy, family bonding, and spiritual renewal.

During Diwali, many individuals, especially females; face the burden of extra work as compared to males due to the preparations and responsibilities associated with the festival. Some of the main sources of additional work during this time are household cleaning, shopping and gift preparations, cooking and preparing sweets, decoration, housing and entertaining, etc. In addition to such preparations, repetitive tasks and improper posture often lead to musculoskeletal discomfort and pain, particularly in areas like the lower back, shoulders and wrists.

Eventually, more musculoskeletal discomfort must be found in females during Diwali preparations due to various factors like morphological reasons like different body structure, wider pelvis, greater curvature in lower back, which can make them more prone to lower back pain and musculoskeletal strain, especially during physical activities. Also the Endocrine Causes like Hormonal fluctuations can lead to joint and muscle pain, making women more susceptible to discomfort during physically demanding tasks of Cultural preparations.^[6] Prolonged physical strain without proper ergonomics or rest intervals increases the risk of muscle fatigue and joint stress, contributing to discomfort.

In this study, percentage prevalence of Musculoskeletal disorders were distributed in almost all areas of the body in females of various occupations including housewives.

Firstly, maximum musculoskeletal discomfort was found in low back region (60% to 85% of females) irrespective of occupational status . A survey study was also conducted by Charanpreet kaur in (2024) also concludes that higher prevalence of musculoskeletal disorders is found in housewives due to predisposing factors like age, BMI distribution, duration of household activities and types of tasks performed. ^[1]

Additional causes for increased prevalence of discomfort in low back are increased lumbar lordosis, decreased core strength, lumbo pelvic hip muscle dysfunction, improper bending, prolonged static positions, etc. [7]

Secondly, approximately 60% and 50% of working women (full-time as well as Part-time) complained of neck and upper back disorders, respectively. Predisposing factors to such musculoskeletal discomfort may be scapular muscle weakness, increased use of upper limb, upper cross syndrome, poor posture, overexertion, prolonged sitting, etc. [8]

Furthermore, antigravity muscles, which help maintain posture (like core, back, and leg muscles), can get fatigued during intense activities like Diwali preparations. Tasks such as prolonged standing, lifting heavy objects and maintaining certain postures strain these muscles.

Thirdly, major MSK discomfort is found in knee region (approximately 50%) in all females of different occupations except students. Reasons for this can be early osteoarthritis changes, hip and knee muscle weakness, improper working postures (static posture or weight bearing posture) for prolonged duration. [9] The study supporting this statement is done by Shettar d. (2017) which also states that due to their increased workload, including tasks like cleaning, shopping, and decorating, regardless of their own work hours or job type leads to such discomfort. [4] Additional to this approx 60 % of MSK discomfort is found in the foot in full time working women due to causes stated above.

Hence, to prevent musculoskeletal discomfort, especially during such cultural preparations, females must take regular breaks, stretch, strengthen the core, use proper lifting techniques, and stay hydrated. These measures can help reduce muscle strain and improve endurance during physical tasks for females irrespective of their job profile.

Therefore, it is clear from this study that physically demanding housework activities during Diwali festive preparations expose females to several known risk factors for musculoskeletal disorders (MSDs) affecting the lower back, neck/shoulder and both upper and lower limbs. Therefore, this type of work should be studied from an ergonomic perspective to identify potential opportunities for prevention.

CONCLUSION

This study revealed lower back pain as the most prevalent health concern across females during Diwali. Notably, females employed part-time exhibited the highest incidence of lower back discomfort, suggesting a potential link between part-time work and increased susceptibility to this health issue. However, discomfort in the back was notably present in females irrespective of their job burdens.

FURTHER RESEARCH

Further research should focus on detailed ergonomic assessments of Diwali preparation tasks, identifying and quantifying specific risk factors, evaluating the effectiveness of ergonomic interventions, developing culturally-sensitive prevention programs, investigating the long-term impact of Diwali-related Musculoskeletal discomfort.

LIMITATIONS OF THE STUDY

1. This study likely employed a cross-sectional design, which provides a snapshot of the prevalence of Musculoskeletal discomfort at a single point in time. It can only show an association between Diwali preparations and Musculoskeletal discomfort but does not definitively prove that the preparations

caused the discomfort. It cannot establish a cause-and-effect relationship between Diwali preparations and the development of Musculoskeletal discomfort.

2. This study relies on self-reported data on Musculoskeletal discomfort and introduces the potential for recall bias. Participants may not accurately remember the onset, duration, or severity of their pain.
3. The study may not have adequately accounted for pre-existing health conditions that could contribute to Musculoskeletal discomfort, such as arthritis, osteoporosis, or previous injuries.

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