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# Prevalence of Work-related Musculoskeletal Disorders among Rural Housewives in Central India

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## Abstract

**Introduction:** Domestic work that includes cleaning, cooking, moping, tidying up, and procurement of basic amenities often extends to the entire day and requires significant physical, emotional, and intellectual labor. The economic burden of musculoskeletal pain is ranked as second to that of cardiovascular disease. **Objectives:** The present study aimed to assess the prevalence of work-related musculoskeletal disorders (MSDs) among the rural housewives in Central India and to find out the association of prevalence with demographic variables. **Methodology:** A cross-sectional study was conducted among 500 housewives who were selected through random sampling from the villages of Raipur district, Chhattisgarh. Demographic proforma and the standardized musculoskeletal discomfort questionnaire were used to collect data regarding MSDs after obtaining all legal permissions. Statistical Package for Social Sciences 16 was used to analyze the collected data. **Results:** Around 61% (303) housewives were around 61% (303) were suffering with musculoskeletal discomforts and out of them 39.27% had pain at the hip region, 37.95% were suffering with lower backache and 19.47% had pain in both knees. There was a significant association ($P < 0.05$) of the prevalence of musculoskeletal discomforts with age, body mass index, marital status, no. of children, and monthly income. **Conclusion:** Housewives' socio-economic and physical health status are contributing risk factors toward the prevalence of MSDs. The social, psychological, and work-related factors are not only affecting the housewife's health and safety it also reducing the gross productivity. Thus, an education and practice of good posture, ergonomic measures, health schemes, and health awareness among rural housewives are very much required.

**Key words:** Back pain, Health, Housewives, Musculoskeletal disorders, Rural, Safety

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## Introduction

Domestic work that includes cleaning, cooking, moping, tidying up, and procurement of basic amenities often extends to the entire day and require significant physical, emotional and intellectual labor. The World Health Organization reported that women constitute 42% of the global workforce and they are more likely to work in the informal sectors (domestic work, agricultural laborers, and handicrafts industry). In India, more than 60% of women are primarily engaged in domestic work.[1] Mostly women work as homemakers but unfortunately, they are generally not adopting any security measures to cover working hazards associated with homemaking.

The musculoskeletal system is considered as one of the core systems in the human body because of its primary functions such as support, stability movement, and protection of internal organs.[2] Musculoskeletal disorders (MSDs) are the prominent cause of disability and long-term pain worldwide which adversely affects the quality of life for lifetime.[3,4] Housewives have several threats to their joints while doing daily work in several poses and due to their physiology.[5] It's something related to the wrong methods of doing the work, their rigorous and repetitive jobs which are not much joint friendly. Domestic cooking is one of the major act of an average Indian housewife who spends around 6 hours in the kitchen every day.[6] A study mentioned that like the other working sector the domestic kitchen also have various risk factors and hazards.[7]

Researchers have found domestic works are one of the potential sources of musculoskeletal pain and discomfort.[8] Work-related fatigue, repetitive strain injuries are more in women compared to men. The propensity of developing MSDs is related to the difference between the demands of work, worker's physical work capacity, personal factors such as existing health problems, and societal factors.[9-11] Several previous studies also have explained that women more likely than men to have MSDs as they consistently found to spend more time on household activities than did men which resulted disability in future.[12,13]

The present study aimed to assess the prevalence of work-related MSDs among the rural housewives in central India and to find out the association of prevalence with demographic variables.

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## Methods

This cross-Sectional Descriptive study was conducted in selected villages (Kapasda, Raita, Tiwaraiya of Dharsiwa Block, Godhi and Bhansoj of Arang Block) of Raipur district of Chhattisgarh. Out of 4 blocks (Dharsiwa, Tilda, Arang, and Abhanpur) of Raipur 2 blocks were chosen by random sampling for data collection. Simple random sampling technique was used to select 500 housewives.

Before data collection approval was taken from University Ethical Committee and respective Panchayat. Participant's consent was also obtained while data collection.

Demographic data of the housewives include age, religion, types of family, marital status, no. of children, house status,

house condition, source of income and monthly income, etc. were collected by interview technique. Height and weight were measured by calibrated weighing machine and measuring tape to calculate body mass index (BMI).

A standardized musculoskeletal discomfort questionnaire was used to collect data that shows picture of different parts of the body such as neck, shoulder, upper back, upper arm, lower back, forearm, wrist, hip, thigh, knee, lower leg, and foot to indicate the area of pain. The tool also includes times of discomfort per week, pain interfere with the ability to daily work or not, history of hospitalization due to pain, etc.[14]

Data analysis was done based on the objectives of the study. It was done to reduce, organize and give meaning to the data using descriptive and inferential statistics with the use of Statistical Package for Social Sciences 16.

## Results

Data presented in Table 1 shows that mean age of housewives who all participated in study was 39.27 (± 12.07) years and a majority (71.6%) of them were from the nuclear family, 95% were married. 76.8% had no children. Majority of them resided in kacha (38%) or in Semi pakka (33.4%) houses. It was found that 50.6% were from the upper class, 26% from the upper-middle class and 17.6% were from the middle class. Source of income was generally agriculture or labor work, few had their own shop, own land to give in lend, few of their husbands were driver. The housewives were with mean weight and height of 47.88 (± 6.23) Kg and 152 (± 5.54) cm, respectively, with a mean BMI of 20.71 (± 3.2). BMI denotes that the majority (60.6%) had normal weight. Only 7% fell under pre-obesity and 32.4 % were underweight.

After administering standardized musculoskeletal discomfort questionnaire, data were represented in Figure 1 which shows that out of 500 housewives, 303 (60.6%) women had musculoskeletal discomfort.

Figure 2 shows that out of 303 affected housewives 39.27% (119) had pain at the hip region, 37.95% (115) were suffering with lower backache and 19.47% (56) had pain in both knees.

Table 2 shows that there was significant association of prevalence of musculoskeletal discomforts with age ($P$ = 0.0001), BMI ($P$ = 0.0001), marital status ($P$ = 0.023), no. of children ($P$ = 0.0001) and monthly income ($P$ = 0.0001).

Table 3 shows that 40.59% of housewives who were suffering from musculoskeletal discomfort, had experienced 1–2 times pain last week and 39.9% had experienced 3–4 times pain last week. 67.99% reported that it was moderately uncomfortable and for 79.87% it was slightly interfered in their daily ability of work. About 5.6% of housewives even got hospitalized due to MSDs. About 13.53% reported that they were not even able to do daily work when pain starts. About 69.64% had persistent pain during data collection time also especially in the hip, knee, lower back, and upper arm area. Causes for recent pain was found as prolong sitting in kitchen or in field, prolong standing in kitchen, during labor work, or working in field, carrying heavy load, and long time bending in field, etc.

**Table 1:** General information of housewives $n$=500

| *Sample characteristics* | *f* | *%* |
|---|---|---|
| Age | | |
| 22–35 | 252 | 50.4 |
| 36–50 | 143 | 28.6 |
| 51–69 | 105 | 21.0 |
| Type of family | | |
| Nuclear | 358 | 71.6 |
| Joint | 142 | 28.4 |
| Marital status | | |
| Married | 475 | 95.0 |
| Separated | 19 | 3.8 |
| Divorcee | 2 | 0.4 |
| Widow | 4 | 0.8 |
| Number of children | | |
| No | 384 | 76.8 |
| One | 93 | 18.6 |
| Two | 3 | 0.6 |
| >2 | 20 | 4.0 |
| House condition | | |
| Kacha house | 190 | 38.0 |
| Pakka house | 143 | 28.6 |
| Semi- pakka house | 167 | 33.4 |
| Monthly income (in rupees) | | |
| Upper class | 253 | 50.6 |
| Upper middle class | 130 | 26.0 |
| Middle class | 88 | 17.6 |
| Lower middle class | 17 | 3.4 |
| Lower class | 12 | 2.4 |

**Table 2:** Association between the prevalence of musculoskeletal discomfort and demographic variables $N$=500

| *Sample characteristics* | *Yes* | *No* | *df* | *Chi-square value* | *P-value* |
|---|---|---|---|---|---|
| Age | | | | | |
| 22–35 | 155 | 97 | 2 | 28.79 | 0.0001* |
| 36–50 | 65 | 78 | | | |
| 51–69 | 83 | 22 | | | |
| BMI | | | | | |
| Under weight | 80 | 82 | 2 | 20.978 | 0.0001* |
| Normal weight | 192 | 111 | | | |
| Pre-obesity | 31 | 04 | | | |
| Type of family | | | | | |
| Nuclear | 212 | 146 | 1 | 1.009 | 0.315 |
| Joint | 91 | 51 | | | |
| Marital status | | | | | |
| Married | 292 | 183 | 3 | 9.549 | 0.023 |
| Separated | 6 | 13 | | | |
| Divorcee | 1 | 1 | | | |
| Widow | 4 | 0 | | | |
| Number of children | | | | | |
| No | 213 | 171 | 33.007 | 3 | 0.0001* |
| One | 80 | 13 | | | |
| Two | 2 | 1 | | | |
| >2 | 8 | 12 | | | |
| House condition | | | | | |
| Kacha house | 113 | 77 | 3.104 | 2 | 0.212 |
| Pakka house | 95 | 48 | | | |
| Semi-pakka house | 95 | 72 | | | |
| Monthly income | | | | | |
| Upper class | 140 | 113 | 25.383 | 4 | 0.0001* |
| Upper middle class | 97 | 33 | | | |
| Middle class | 51 | 37 | | | |
| Lower middle class | 13 | 4 | | | |
| Lower class | 2 | 10 | | | |

*Significant at the 0.05 level of significance. BMI: Body mass index

## Discussion

The present study found 60.6% of housewives had musculoskeletal discomfort among whom 39.27% had pain at hip region, 37.95% were suffering with lower backache and 19.47% had pain in both the knees. These data are indicating a high prevalence of musculoskeletal discomforts among the housewives with a

**Table 3:** Frequency percentage distribution of effect of musculoskeletal discomfort on work ability *n*=303

| *Variables* | *f* | *%* |
|---|---|---|
| During the last work week, how often did you experience ache, pain, discomfort? | | |
| Never | 8 | 2.64 |
| 1–2 times last week | 123 | 40.59 |
| 3–4 times last week | 121 | 39.93 |
| Once every day | 42 | 13.86 |
| Several times every day | 9 | 2.97 |
| How uncomfortable was that? | | |
| Slightly uncomfortable | 73 | 24.09 |
| Moderately uncomfortable | 206 | 67.99 |
| Very uncomfortable | 24 | 7.92 |
| Did it interference with your ability to work? | | |
| Not at all | 34 | 11.22 |
| Slightly interfered | 242 | 79.87 |
| Substantially interfered | 27 | 8.91 |
| Ever have you been hospitalized due to pain/discomfort? | 17 | 5.6 |
| Ever have you been were not able to do daily work due to pain/discomfort? | 41 | 13.53 |
| Do you have any recent pain/discomfort? | | |
| Hip, both knee, lower back, lower back to the knee, upper arm | 211 | 69.64 |

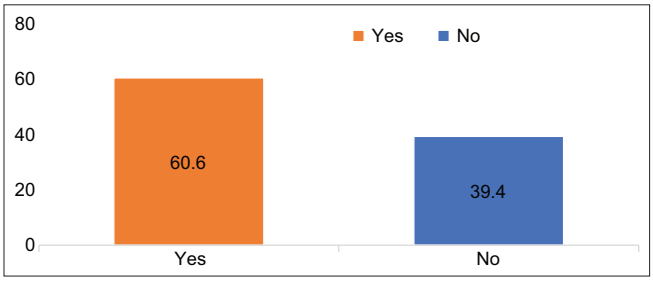


**Figure 1:** Prevalence of musculoskeletal discomfort among the housewives

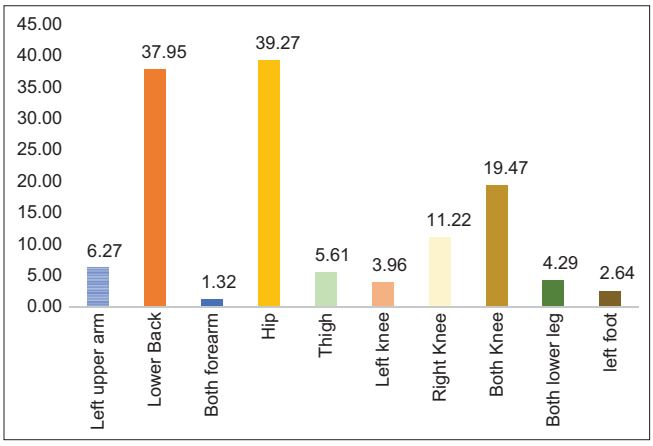


**Figure 2:** Prevalence of musculoskeletal discomfort in various body parts. *Multiple response

predominant effect on hip, low back, and knee region. There is extensive literature available on low back pain,[15] but in a developing country like India and among the rural housewives, its mostly unreported or unrecorded.

There are various risk factors which may contribute to musculoskeletal discomfort among housewives, such as recent family, children, or working duration, frequency, and methods. During data collection, most of the housewives have reported they start working early in the morning and continue till midnight. One of the possible reasons for the high prevalence of LBP could be that the combination of farming and other household work is capable of causing low back pain,[16] as it was found in the recent study that, the housewives of rural Chhattisgarh go to collect wood self by walking more than 2 km distance every 1.79 (± 1.16) day per week, 93% of them carry water in big bucket with mean 90.22 (± 82.38) L per day, 60.8% of housewives work directly under sunlight in their field or with farm animal or do some labor work (3.6 [± 3.13] h/day). 57.2% of housewives stand for prolong time with range of 9 h when they work at field or do labor work. 73.8% sits for prolong time at kitchen while cooking or cutting vegetable, while cleaning/mopping the house. Their long working hours without sufficient rest periods, poor posture, lifting or carrying loads also contribute to their back pain.[17-19]

Housewives being female, physiologically prone to develop low back pain due to risk factors such as pregnancy, body shape, size, muscle mass, muscle strength, and aerobic capacity, in combination with different physical demands, etc. All of these results many studies found women have a higher musculoskeletal morbidity than men in general population as well as in working population.[20] In female, hormonal changes responsible for the development and growth of muscles and ligaments of the back,[16,21] in particular, the ability of the muscle to generate force declines precipitously following menopause.[22] This reduces force and strength of muscle and ligaments ultimately causes pain in lower back.[23]

This study shows a significant association of prevalence of musculoskeletal discomforts with Age ($P=0.0001$), BMI ($P=0.0001$), no. of children ($P = 0.0001$) and monthly income ($P = 0.0001$). Study indicated that age and weight were positively associated with musculoskeletal discomfort. This was in accordance with the literature reporting on the degeneration of physical function with increased age and weight.[24,25] Loss of muscle (sarcopenia) is a process that starts around age 30 and progresses throughout life. In this process, the amount of muscle tissue and the number and size of muscle fibers gradually decrease. The result of sarcopenia is a gradual loss of muscle mass and muscle strength. This mild loss of muscle strength places increased stress on certain joints (such as the knees). Muscle fibers that contract faster decrease much more than the numbers of muscle fibers that contract slower. Thus, muscles are not able to contract as quickly with age.[26] Being overweight or obese puts extra weight on human muscles and thus increases the risk of musculoskeletal discomforts.[27,28] Recent research has shown that post-menopausal females exhibit increased fat mass and increased systemic inflammatory markers.[29]

Significant association of musculoskeletal discomforts with a number of children is due to the effect of more numbers of child birth. Women with more children have reported to develop more musculoskeletal discomforts than single women with no children due to an increase in home strains.[30] An increase in the number of children may increase work load and stress level in housewives, which could be manifested in increased prevalence of musculoskeletal discomforts.[31] Various study shows pelvic muscle strength decreases after childbirth.[32,33] It was observed that the lowering the Pelvic muscle strength can increase the risk of pain-related disability. Other studies have reported a significant low back problem among women due to decrease pelvic muscle

strength.[34] The pelvic muscle contributes toward the trunk stability therefore, it is possible that lowering the pelvic muscle strength may affect the lumbar-pelvic stability, resulting in low back pain.[35]

Low income showed a significant association with musculoskeletal discomforts among housewives. Various studies reported socioeconomic inequalities in the risk factors of low back pain.[36,37] A recent large-scale cross-sectional study from the United States reported that the lowest income levels are significantly associated with low back pain compared with the highest income levels.[38]

The study found that the housewives who have reported recent episodes of pain, have also reported frequent pain and restriction in their daily activities in last week. The housewives are forced to take pause from their work due to uncomfortable pain or some time due to hospitalization with pain. These observations are consistent with finding of Birabi *et al*. (2012) that once back pain occurs, it is likely to continue.[16]

## Conclusion

The present study found that basically rural housewives had a high prevalence rate of musculoskeletal discomfort generally hip pain, lower backache, and knee pain. Housewives' socio-economic and physical health status are contributing risk toward the prevalence of WMSD. The condition is not only affecting the housewives' health and safety but also reducing the gross productivity. Thus to improve the health, safety, and productivity of the rural housewives, an education on knowledge and practice of good posture, ergonomic measures, health schemes, and health awareness is very much required.

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