

Musculoskeletal pain and perceived exertion among women in rural kitchen

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■ **ABSTRACT** : The present study was planned to assess the musculoskeletal pain and perceived exertion among women in rural kitchens of Kanpur Nagar. Two villages *i.e.* Hindupur and Dharampur villages from Kalyanpur block and Hridaypur and Kishunpur villages from Chaubepur block were selected randomly for the purpose of study. Purposive sampling was done to select 60 respondents from each village having compact kitchens, either separately or in form of enclosed varandah. The data on musculoskeletal pain was gathered by using body map technique based on a rating scale of Varghese *et al.* (1989) and perceived rate of exertion through Borg's 10 point scale. Analysis of data reveals that severity of musculoskeletal pain was higher in lower back followed by upper back, elbow joint, neck and shoulder whereas rate of exertion perceived by women in rural kitchen was highest while fetching water followed by dishwashing, moping, serving meal and peeling and chopping vegetables.

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■ **KEY WORDS**: Musculoskeletal pain, Perceived rate of exertion, Kitchen, Women, Rural

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Musculoskeletal conditions affect more than 1.7 billion people worldwide and have the fourth greatest impact on the overall health of the world population considering both death and disability. This burden has increased by 45 per cent during the past 20 years and will continue to escalate unless action is taken. The homemaker plays an important role in nurturing the society. They perform a multitude of tasks that cause ergonomic stress and exhaustion of muscle groups that result in MSP. The working, living and social architecture in rural areas are different from urban areas and homemaker being nucleus of the family are exposed to very different stress and their health impact.

Musculoskeletal pain continues to be a major cause of morbidity with considerable economic and societal consequences (Norlund and Waddel, 2000 and Mantyselka *et al.*, 2002). Pain disorders have a negative impact on work ability and work effectiveness (Frank *et al.*, 1996 and Blyth *et al.*, 2003). Occupations with high physical work strain, non-neutral postures, prolonged static muscle contractions and repetitive movements are regarded as harboring an increased risk of musculoskeletal pain (National Research Council and the Institute of Medicine, 2001). Kitchen workers face a number of occupational hazards. Several risk factors for the development of musculoskeletal disorders can be

identified in their daily work tasks. Kitchen workers are mostly women with a high physical workload. Kitchen work is done almost exclusively standing, sitting or walking which lead to body exertion and reduced capacity of homemaker. Perceived exertion is a subjective intensity of effort, strain, discomfort and fatigue experienced during physical exercise (Robertson and Noble, 1997). It is a frequently used quantitative measure of perceived exertion during physical activity (Roelands *et al.*, 2013).

RESEARCH METHODS

Descriptive-cum-experimental research design was adopted to study the musculoskeletal pain and perceived rate of exertion among women in rural kitchen in Kanpur Nagar. The multi-stage purposive random sampling design was used to select the locale, village and respondents. Two hundred forty respondents having compact kitchen were purposively selected from randomly selected Hindupur and Dharampur villages of Kalyanpur block and Hridaypur and Kishunpur villages of Chaubepur block. Personal interview method was used for data collection. Principal tool used to gather data was Body Map Technique based on a rating scale of Varghese *et al.* (1995) to assess musculoskeletal pain and Borg’s 10 point scale (1982) and Borg (1982) modified by Varghese *et al.* (1989) to assess perceived rate of exertion.

RESEARCH FINDINGS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized

under following heads :

Musculoskeletal pain in body parts:

All the bodily movements and physical efforts in the kitchen activities require considerable muscular effort and movement of joints. These musculoskeletal movements occur as a result of contraction of the muscles involved. Internal expenditure of energy on this act produces externally visible and measurable work. It also generates variable degrees of pain and exertion for different activities. In order to ascertain the degree of severity of pain, five point scales of Varghese *et al.* (1995) for female workers was used Analysis of data reveals that as a consequence of kitchen activities very few respondents felt very severe pain (Table 1). Most of the respondents (1.66 %) felt very severe pain in the upper and lower backs and only 0.83 and 0.41 per cent feeling pain of this intensity in their necks and legs, respectively. A quarter of the respondents, felt severe pain in their elbow joints, superseded and followed by pain of this intensity in the lower back of 28.3 per cent and upper back of 15.00 per cent, respectively. Maximum number of respondents felt moderate type of pain in their different body parts. Highest proportion of respondents (60%) having in their upper back followed by lower back (50.00%), neck (34.16%) and elbow joint. Maximum number of respondents had mild pain in their shoulders (38.75%) followed by shoulder joint (35.41%), leg (21.25 %), upper back (17.50%) and lower back (14.16%). Respondents have very mild pain in some of their body parts. Maximum number of respondents faced this problem in their shoulder joints (19.16%), shoulder (17.91 %), knees (11.25%) and legs (9.16%). An equal number

Table 1 : Musculo-skeletal pain in different body parts of women in rural kitchen							(n=240)	
Sr. No.	Body parts	Severity of musculo-skeletal pain					Mean score	Rank
		V severe	Severe	Moderate	Mild	V mild		
1.	Upper back	4 (1.66)	36 (15.00)	144 (60.00)	42 (17.5)	7 (2.91)	2.86	II
2.	Shoulder	0 (0.00)	4 (1.66)	41 (17.08)	93 (38.75)	43 (17.91)	1.53	V
3.	Shoulder joint	0 (0.00)	7 (2.91)	24 (10.00)	85 (35.41)	46 (19.16)	1.32	VII
4.	Neck	2 (0.83)	43 (17.91)	82 (34.16)	34 (14.16)	18 (7.5)	2.14	IV
5.	Leg	1 (0.41)	16 (6.66)	22 (9.16)	51 (21.25)	22 (9.16)	1.08	VIII
6.	Elbow joint	0 (0.00)	60 (25.00)	72 (30.00)	22 (9.16)	15 (6.25)	2.15	III
7.	Finger	0 (0.00)	0 (0.00)	1 (0.41)	9 (3.75)	18 (7.5)	0.16	IX
8.	Knee	0 (0.00)	20 (8.33)	55 (22.91)	33 (13.75)	27 (11.25)	1.40	VI
9.	Lower back	4 (1.66)	68 (28.33)	120 (50.00)	34 (14.16)	7 (2.91)	3.11	I

Figures indicate frequency with percentage in parentheses V= Very

of respondents (7.50%) felt very mild pain in their neck and fingers.

On taking into account the variety of pains in specific body parts, lower back, with a mean pain score of 3.11, ranked as the most strained body part. It was followed by upper back (2.86), elbow joint (2.15), neck (2.14) and shoulder (1.53). Least strained body part with the lowest mean pain score of 0.16 was finger followed by leg (1.08), shoulder joint (1.32) and knee (1.41).

Perceived rate of exertion:

Perceived exertion, real and sometimes imaginary, plays very important role in the suffering and well being of the homemakers. It is one of the criteria for evaluating the strain and fatigue during physical activity and is based on individual's sensation as perceived following the activity. A modified rating scale of perceived exertion (RPE), developed by Verghese *et al.* (1989) based on 10 point perceived rate of exertion scale of Borg (1982).

Analysis of data in Table 2 reveals that respondents felt very heavy exertion, while fetching water (83.33%) followed by dishwashing (36.66%), mopping (31.25%), serving meal (22.91%), peeling and chopping of vegetable (19.16%) and sweeping (18.75%). Most of the respondents feeling a little lower, *i.e.*, heavy exertion, did so while grinding masala (56.25%), mopping (52.08%), rolling and puffing chapatti, (50.00%) dishwashing

(45.83%) and serving meal (41.66%). Moderately heavy exertion was reported by the maximum number of respondents for kneading dough (60.41%) followed by washing vegetables (50.00%) and sweeping (50%), rolling and puffing chapatti (29.16%), peeling and chopping vegetables and serving meal (23.33%). Most of the respondents feeling light exertion did so in case of frying and cooking vegetables (75.00%) followed by sieving flour (28.33%), peeling and chopping vegetables (20.00%), kneading dough (19.16%) and washing vegetables and sweeping (16.66%). Some of the respondents felt very light exertion while performing certain kitchen activities. Maximum proportion of respondents felt this type of exertion while sieving flour (58.33%) followed by washing vegetables (22.91%), collection of firewood (22.50%) and grinding masala, rolling and puffing chapatti and frying and cooking vegetables (8.33%) in each case.

Based on mean exertion scores for individual kitchen operations fetching water, with a score of 4.79 is rated as most exerting activity followed by dishwashing (4.15), mopping (4.14), serving meal (3.73), peeling and chopping vegetables (3.56), grinding masala (3.49) and rolling and puffing chapatti (3.27). Sieving flour, with a mean score of 1.55 was perceived as the least exerting activity. It was followed by frying and cooking vegetables (2.14), washing vegetables (2.48), kneading

Table 2 : Perceived rate of exertion among women for selected kitchen activities		Rating of perceived exertion					Mean score	Rank
Sr. No.	Activities	Very heavy	Heavy	Moderately heavy	Light	Very light		
1.	Collection of firewood	40 (6.66)	67 (27.91)	46 (19.16)	33 (13.75)	54 (22.50)	3.02	IX
2.	Fetching water	200 (83.33)	30 (12.50)	10 (4.16)	0 (0.00)	0 (0.00)	4.79	I
3.	Washing vegetables	0 (0.00)	25 (10.41)	120 (50.00)	40 (16.66)	55 (22.91)	2.48	XI
4.	Peeling and chopping vegetables	46 (19.16)	90 (37.50)	56 (23.33)	48 (20.00)	0 (0.00)	3.56	V
5.	Grinding masala	23 (5.41)	135 (56.25)	40 (16.66)	22 (9.16)	20 (8.33)	3.49	VI
6.	Sieving flour	0 (0.00)	0 (0.00)	32 (13.33)	68 (28.33)	140 (58.33)	1.55	XIII
7.	Kneading dough	0 (0.00)	36 (15.00)	145 (60.41)	46 (19.16)	13 (5.41)	2.85	X
8.	Rolling and puffing chapatti	5 (2.08)	120 (50.00)	70 (29.16)	25 (10.41)	20 (8.33)	3.27	VII
9.	Frying vegetables	0 (0.00)	15 (6.25)	25 (10.41)	180 (75.00)	20 (8.33)	2.14	XII
10.	Cooking vegetables	0 (0.00)	15 (6.25)	25 (10.41)	180 (75.00)	20 (8.33)	2.14	XII
11.	Serving meal	55 (22.91)	100 (41.66)	56 (23.33)	24 (10.00)	5 (2.08)	3.73	IV
12.	Sweeping	45 (18.75)	25 (10.41)	120 (50.00)	40 (16.66)	10 (4.16)	3.23	VIII
13.	Mopping	75 (31.25)	125 (52.08)	40 (16.66)	0 (0.00)	0 (0.00)	4.14	III
14.	Dishwashing	88 (36.66)	110 (45.83)	32 (13.33)	10 (4.16)	0 (0.00)	4.15	II

Figures indicates frequency with percentage in parenthesis

dough (2.85), collection of firewood (3.02) and sweeping (3.23).

Conclusion:

In conclusion, when examining musculoskeletal pain among female kitchen workers, we found moderate to mild pain in almost all body parts. Lower back, neck, elbow joint and upper back were major body parts experiencing pain of very severe to severe category. Moderately heavy perceived rate of exertion was reported by female kitchen workers for all kitchen activities but fetching water, moping and dishwashing showed very heavy to heavy exertion among homemakers. Design and work layout of rural kitchen need to be re-designed and homemakers must also be trained for improved work habits to avoid bodily discomfort and its resulting long-term consequences.

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