

## Musculoskeletal Problems among Agricultural Female Workers

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**ABSTRACT** A scrutiny of occupational profile of population in India where maximum population depends for their livelihood on agriculture only points out that women make up 46 percent of total agriculture work force and there is hardly any activity in agriculture except ploughing and household chores in which women are not actively involved. At the same time this sector is considered as the most hazardous occupation and reason of various health problems like MSPs and MSDs in women workers. Thus a study was conducted on sixty farm women to identify the extent of musculoskeletal problems in them. Incidence of musculoskeletal symptoms, information on causes of pain, work load and severity of pain were assessed by self structured questionnaire and body map technique. The findings of the study indicated that farm women remain fully occupied and over-burdened with three- fold responsibility of farm, home and livestock management before they attain the age sixteen. Awareness about musculoskeletal problems was found to be very low among female workers albeit these women workers they were suffering from discomforts/pain in various parts of the body. Education on health and awareness about developed women friendly technologies for farm, home and livestock would help in minimizing the extent of musculoskeletal problems among agricultural female workers.

### INTRODUCTION

Agriculture ranks among the most hazardous industries. Farmers are at very high risk for fatal and non-fatal injuries; and farming is one of the few industries in which family members (who often share the work and live on the premises) are also at risk for fatal and non-fatal injuries (NIOSH 2013). The physical demand of the farm work which range from moderate to heavy, often include standing, squatting, bending and reaching, carrying heavy loads and working for long hours, may cause certain hazards to the person. Thus the health of agricultural worker is always at risk.

Though farm mechanization is at rapid pace but the operations performed by men are mostly mechanized. Ironically, recent agricultural innovations have not benefited farm women and they still do what is primarily manual labour. Women continue to use the same traditional tools for their work (Ghosh 2007). Long hours of work, continuous attention, precision, and variety in work, extreme postures, poor nutrition and health apparently indicate that the farm women are under serious physical stress. Overexertion and injury can cause inflammation of the bursac or bursitis. "Housemaid's knee" is a well-known type of occupational bursitis where the viscous fluid in bursac, that is situated at 150 different places in tissues in human body, is displaced leading to pain in that part of the body due to long

hours of working. This nerve damage can cause loss of sensation or numbness or tingling known as neuritis in areas of the body supplied by the nerve. Over-exertion can cause increased pressure in a muscle resulting in oedema or scar tissue formation, which results in impaired nerve function. Impaired nerve function, destruction of fibres or damage resulting in reduced nerve conduction velocity may cause muscle weakness. Holding joints in an awkward posture for long hours is an unavoidable state of affairs in agriculture, household or animal care jobs and is a big reason for increase in probable episodes of these problems. 'The ability of the muscles to protect the joints against external forces is degraded and the joint itself is more easily damaged when the limb is exposed to high forces' (Bridger 2008).

The musculoskeletal problems are considered to be the most prevalent and pricey of all work related injuries. Musculoskeletal problems start as minor aches and pain, but when left unaddressed can result in serious injuries that can be permanently disabling. In addition, these painful injuries take long recovery periods and chances are that severely injured women may never be able to return to their jobs. The present study is an effort to know the common work related musculoskeletal problems among agricultural female workers and their causative factors so that these findings can be applied towards prevention of MSPs and MSDs among agricultural workers.

## MATERIAL AND METHODS

The present study was undertaken in two randomly selected *panchayat samities*, that is, Girva and Salumber Panchayat Samiti out of eleven *panchayat samities* of Udaipur district in the year 2005. Further three villages from each *Panchayat Samiti* namely Kiyawton ka falan, Bhutia, Khurabad from Girva Panchayat Samiti and Dharod, Dal, Gud from Salumber *panchayat samiti* were selected for the present study, as these were well connected with road and easily approachable.

Girva Panchayat Samiti (2061.34 square km area) had a total 3,51,425 rural population. There were 30,360 rural male and 26,804 rural female farmers whereas 4,740 rural male and 7,682 rural female were working as farm laborers. Similarly, in Salumber *Panchayat Samiti* (925.82 square km area) there were 33,947 male, 27,064 female farmers and on the other hand had only 3,054 male as against 7,276 female farm labourers (Census 2001). The statistics indicated intensive participation of female populace in agriculture and allied activities involving long hours of work, continuous attention, precision, variety in work, extreme postures. The hardships of farm women with poor nutrition motivated researcher to investigate the prevalence of musculoskeletal problems, as, these problems are considered the most prevalent and costly of all work related injuries (NAS 2001).

The present study on musculoskeletal problems among agricultural female workers was conducted on a sample of 60 farm women. The sample ranged between the age group of 20 years to the stage of onset of menopause. The women from small farmers' (3-4 *bigha* irrigated land) family who were involved in carrying out the jobs related to household, agriculture and care of livestock from last 5 years or more, were the sample. The requirement of the sample was fulfilled from randomly selected two *panchayat samities* namely Girva and Salumber.

## RESULTS AND DISCUSSION

The results and their interpretation in context to the objective of the present study of finding the common work related musculoskeletal problems among agricultural female workers and their causative factors are given in the following paragraphs:

## Background Information

Table 1 presents the background information of respondents. Data reveals that majority, that is, 40 percent respondents were in the age group of 31-40 years. Maximum (80 percent) respondents were illiterate and only four respondents passed secondary school. Majority, that is, 75 percent respondents were involved in subsidiary occupations like labourer, service, and self-employment. Agriculture is the kind of occupation in which farm women become free for 3-4 months in a year. At that time they occupy themselves in subsidiary occupations, for increasing their incomes. It is clear from the above discussion that farm women remain busy round the year irrespective of the lean or peak season.

**Table 1: Personal characteristic of the respondents**

Particulars	Total = 60	
	F	%
<i>Age of the Respondents</i>		
• 20-30 years	20	33.33
• 31-40 years	24	40.00
• 41-50 years	16	26.67
<i>Educational Status</i>		
• Illiterate	48	80.00
• Primary education	8	13.33
• Matric	4	6.67
<i>Subsidiary Occupation</i>		
• Labourer	45	75.00
• Service	23	38.34
• Self employee	20	33.33
	2	3.33

## Entry Age of Involvement in Work

Table 2 reveals that most of the women started their involvement in the household work between the age group of 8-11 years (70 percent), and in agriculture work and animal care activities between the age group of 12-15 years (68.33 percent and 43.33 percent respectively). Involving these young girls in any of the activity at a very early age is very detrimental to their health. Studies centred on children's participation in agricultural work have often focused on fatal and/or traumatic injuries (Bancej and Arbuckle 2000; Reed and Claunch 2000; Gerberich et al. 2001). Starting of work at early age means more work years in life. In childhood, muscles and skeletal are comparatively weak. In rural areas the problem is more crucial as these girls do not get good nutrition. Children do work with adult equipment or perform tasks designed for adults who are

larger and stronger (Allread and Waters 2007). Due to lack of nutrition and knowledge of working procedure, the tasks lead to drudgery and these future women may face long term musculoskeletal problems viz., low back pain, numbness, frozen shoulder and this leads to musculoskeletal disorders like carpal tunnel syndrome, masfan syndrome, tennis elbow etc.

**Table 2: Entry age of involvement in household, agriculture and animal care activities**

Age group	Household work	Agricultural work	Animal care activities
8-11 years	42(70)	2(3.33)	21(35)
12-15 years	16(26.67)	41(68.33)	26(43.33)
16 and above	2(3.33)	17(28.33)	13(21.67)

**Time Spent on Household, Agriculture and Animal Care Activities**

Data on time spent on household, agriculture and animal care activities in lean and peak season is very momentous in understanding the workload of farm women (Table 3). Majority of female workers spent 5-6 hours/day on household chores in lean season while in peak season they could not spare more than 3-4 hours/day for household chores. In peak season majority, that is, 66.67 percent women spent 7-8 hours/day on farm activities while during lean season women had to spend 4-5 hours/day. Interestingly in case of animal care activities time use pattern (time spent ranging between 2-3 hrs) of women was not affected much due to season. The total time spent on all the three activities by majority of female worker (73.33 percent) in peak season thus was 12-14 hours/day with one hour of rest, whereas in lean season most of the women (65 percent) spent 10-12 hours/day at work with 2 hours of rest.

**Musculoskeletal Problems among Female Worker in Agriculture**

The musculoskeletal problems among female worker in agriculture were studied through perceived pain reported in different parts of the body by respondents and the result is given as under:

**Neck and Shoulders :** The pain in neck and shoulders is directly related to lifting loads on head. Table 4 indicates that 24 respondents that is, forty percent female workers reported severe pain in neck and total fifty-five percent respondents reported pain in shoulder. There is hardly

**Table 3: Time spend/day on household, agriculture and animal care during lean and peak season**

Activities	Time spent/day (in hours)	Lean season		Peak season	
		F	%	F	%
Household	3-4 hours	3	5.00	39	65.00
	4-5 hours	16	26.67	15	25.00
	5-6 hours	36	60.00	6	10.00
	6-7 hours	0	0.00	0	00.00
	7-8 hours	5	8.33	0	00.00
Agriculture	3-4 hours	14	23.33	0	00.00
	4-5 hours	36	60.00	3	5.00
	5-6 hours	0	00.00	6	10.00
	6-7 hours	10	16.67	11	18.33
	7-8 hours	0	00.00	40	66.67
Animal care	1-2 hours	11	18.33	15	25.00
	2-3 hours	23	71.67	43	71.67
	3-4 hours	6	10.00	2	2.33
	At least 10 hours	6	10.00	0	00.00
	10-12 hours	39	65.00	4	6.67
Total time spent in all the three activities	12-14 hours	9	15.00	44	73.33
	Above 14 hours	6	10.00	12	20.00
	Rest "Day Time"	Less than 1 hour	0	00.00	6
	1 hour	0	00.00	29	48.33
	1.30 hours	17	28.33	16	26.67
	2 hours	30	50.00	9	15.00
	More than 2 hour	13	21.67	0	00.00

any agricultural activity except ploughing where women are not involved (Menon and Seshadri 2004). They perform all the activities like preparation of land, sowing, transplanting, watering, weeding, fertilizer application, pesticide spraying, harvesting, threshing, processing, and storage and all these cause pain in neck and shoulder. Lifting, forceful action and load on back is the cause of pain in neck, shoulders and shoulder joints. The static relaxation during repetitive tasks and bending is also related to shoulder pain which is very frequent in household, livestock care and agricultural activities (Table 4). According to Bridger (2008), static relaxation is cause of pain in neck and cause of degeneration of spine. Degeneration of cervical spine sometimes known as cervical spondyloysis has serious consequences. Working with the hands above shoulder height is stressful and may increase the risk of developing the so called impingement syndrome, otherwise known as "swimmer's shoulder", "pitcher's arm" (Weiner 1992), or rotatory cuff syndrome".

**Upper Arms, Elbows and Wrists** - Hands are most active organs while working thus overwork by these organs lead to pain. Table 4 also shows that total 51.67 percent women reported pain in upper arm, whereas 76.67 percent respondents

**Table 4: Distribution of respondents according to perceived pain in different body**

Body parts	Severity of pain {F (%)}					Total
	Very Severe	Severe	Moderate	Light	Very light	
Neck	5 (8.33)	24 (40.00)	10 (16.67)	6 (10.00)	0 (00.00)	45 (75.00)
Shoulder	4 (6.67)	15 (25.00)	4 (6.67)	10 (16.67)	0 (00.00)	33 (55.00)
Upper arm	2 (3.33)	7 (11.67)	5 (8.33)	5 (8.33)	12 (20.00)	31 (51.67)
Elbow	0 (00.00)	15 (25.00)	16 (26.67)	6 (10.00)	9 (15.00)	46 (76.67)
Wrist	7 (11.67)	13 (21.67)	8 (13.33)	6 (10.00)	6 (10.00)	40 (66.67)
Palm and fingers	0 (00.00)	2 (3.33)	6 (10.00)	7 (11.67)	9 (15.00)	20 (33.33)
Upper back	2 (3.33)	14 (23.33)	6 (10.00)	13 (21.67)	2 (3.33)	37 (61.67)
Low back	16 (26.67)	16 (26.67)	7 (11.67)	3 (5.00)	7 (11.67)	49 (81.00)
Pelvic region (Hips)	0 (00.00)	1 (1.67)	2 (3.33)	5 (8.33)	9 (15.00)	17 (28.33)
Thighs	6 (10.00)	7 (11.67)	7 (11.67)	7 (11.67)	3 (5.00)	30 (50.00)
Knees	0 (00.00)	5 (8.33)	6 (10.00)	6 (10.00)	0 (00.00)	17 (28.33)
Calf muscles	9 (15.00)	12 (20.00)	2 (3.33)	7 (11.67)	8 (13.33)	38 (63.33)

reported pain in elbow and 66.67 percent pain in wrist. Due to static position of hands, while bearing load on head, for support to the loaded material, onset of fatigue in upper arm muscles and pain thereby is inevitable, lifting head load therefore is another cause of pain.

Activities like winnowing, weeding, milking, rolling *chappati*, brooming etc. require repetitive movements and are also known to be associated with discomfort or disability in wrist. Strictly speaking, it is incorrect to make a sharp distinction between repetitive and static work since most repetitive work includes a static component in the form of postural flexion of the body or of a limb. High risk jobs require repeated, forceful movements of body parts held at the extremes of their ranges of movements, such as with the wrist flexed, extended and promoted, for example milking in static posture with flexed wrist is one of the causative activities of pain in wrist. Carpal tunnel syndrome is a common ailment affecting the wrist and hand.

**Palms and Fingers:** Results indicate that some extent of pain in respondent's palm was also there although the number was small. The static task of griping like working with sickle, peeling vegetables etc is the reason of tingling sensation and numbness in the palms and fingers. Table 4 shows that 10 percent women reported moderate pain and 6.67percent reported light pain. Fingers are also associated with palm and wrist movements while working. Table 4 further reveals information about pain in fingers. Small number, that is, 15 percent women reported very light pain, in fingers while using small hand tools in agriculture and at home. An increased pressure in the carpal tunnel can cause carpal tunnel syndrome, it affects the median nerve. The extreme condition of carpal tunnel syndrome

leads to severe pain and total inactivity of the worker's hand.

**Upper and Low Back:** Shockingly a large segment of sample that is, 81 percent women reported pain in low back and 61.67 percent women reported pain in thoracic region (Table 4). Lifting of head loads is a kind of static work wherein muscles of neck and spines in seven top most vertebrae of spinal cord are under continuous compression. The impact is gradually transferred to lower part of spinal column. The inactivity of muscles retards the blood supply to the area and causes deposition of waste resulting in pain extending to thoracic region and even lower body (Jumah and Nyame 2004).

Pain in the lower back restricts mobility and interferes with normal functioning. Low back pain is the most significant health problem due to continuous bending of lumbar spine in stooping posture. The women repeat this posture many times, while doing tasks like cutting crops, collecting fodder, weeding, brooming, lifting cow dung. Pain is unlikely to arise from the inter-vertebral disks themselves since they do not contain nerve ending in adult (Bridger 2008). The incidence of low back pain is higher as the lower part of the back bears the weight of the upper body plus any weight that is carried and it also twists and bends more than the upper back.

**Pelvic Region:** Table 4 shows that pelvic region, where the pelvic joint is a ball and socket joint that allows motion and provides stability needed to bear body weight on legs, was comparatively less affected part as reported by women. Although, in general its function (bearing the body's weight) makes it susceptible to arthritis due to excessive pressure and pain in hip may involve injury to muscles, tendons or bursa.

### Thighs, Knees and Calf Muscles

The pain in thighs besides poor nutrition is associated to covering long distances daily with head loads and extreme postures viz. kneeling and squatting for long hours at home and farm. Table 4 shows that 56.67 percent women had pain in thighs. A large segment (63.33 percent) had reported pain in calf muscles also. Thighs and calf muscles are both more related to walking and legs bear the weight of the whole body, and also of loads or weight on head. Ultimately legs are more prone to fatigue and pain. Other postures like bending, twisting squatting also affect the leg muscles. About 28.33 percent women had pain in knees. Several supporting and moving parts, including bones, cartilage, muscles, ligaments and tendons, help the knees to do their job. There are two general kinds of knee problems: mechanical and inflammatory. Arthritis, Chondromalacia (cartilage injury), injury to the Meniscus (caused by the force of relating the knee while bearing weight), anterior and posterior Cruciate Ligament Injury (ACL, PCL), medial and lateral collateral ligament Injury (MLL, LLL), tendonitis and ruptured (torn) tendons (inflammation of tendon), Osgood-Schlatter disease, Iliotibial Band Syndrome, Osteochondritis Dissecans, Plica Syndrome etc. can be the common knee problems to which the farm women are bound to be exposed as a result of extreme postures, lifting loads, long hours of work and poor nutrition (NIAMS 2001).

### CONCLUSION

Farm women suffer from multiple musculoskeletal problems that are caused by over use or misuse of muscles, bones and nerves and significantly impair their activities of daily living. High incidence of pain as reported by farm women in various body parts viz. neck, shoulder, elbow, wrist, mid back and low back, knee and calf muscles in over burdened rural women indicates that women are at continuous health risk. The erroneous habit of not mentioning about musculoskeletal problems at the right time, or “having learned to live with pain” makes women susceptible to high health risks, as left unaddressed, musculoskeletal disorders that comprise of over 150 diseases and syndromes and are usually progressive and associated with pain, result in life-long pain and permanent disability giving rise to enormous health care expenditure and loss of

work. The fact that is required to be ascertained before the farm women is that when they suffer from musculoskeletal problems although their physical health is principally impinged on, but their mental, economic and social functions are also impaired, thus affecting the quality of life of not only the farm women themselves, but their families as well.

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