

# Musculoskeletal discomfort perceived by perishable good sellers in hilly areas

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■ **ABSTRACT :** The study was conducted to find out the musculoskeletal discomfort perceived by vegetable and fruit sellers while performing the activities to complete the whole process of selling from procuring the goods till handing it over to the buyers. A total of 50 sellers within the age group of 18 to 50 years from West Garo Hills are considered for the study. Findings revealed that the respondent's involved in selling of vegetables and fruits felt discomfort ranging from moderate to severe. The perceiving of moderate to severe pain in different parts of the body may lead to musculoskeletal disorder. Hence, for ergonomic intervention to prevent musculoskeletal disorder at the early stage database related to perceived discomfort is essential.

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■ **KEY WORDS:** Musculoskeletal problems, Body map, Pain, Upper body parts, Lower body parts

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Sellers of perishable goods play an important role to fulfill the daily requirements of general mass to maintain a good health. Apart from playing the important role of supplying vegetables and fruits to the consumers they also play a vital role in economic upliftment of the population involved in cultivation. Hence, their health is major concern for the wellbeing of the society. While serving the society the sellers engaged in process of selling of vegetables and fruits face problems, some of which are related to finance, transportation, physiological and anatomical etc. Among these problems most hazardous to health is the anatomical problem that is the permanent damage of the ligaments, tendons and bones due to awkward postural changes and repetitive work motions. When it comes to the sellers working in hilly terrain it is more arduous compared to their

counterpart working in the plain areas because of the geographical location and less accessibility to the ergonomic technologies. Moreover, research review reveals that there is lack in studies considering this important section of population. Thus, the present study was concentrated on both male and women sellers of three daily markets located under Tura Municipal Board, West Garo Hills, Meghalaya with the following objectives:

- To find out the activities performed by vegetable and fruit sellers
- To find out the musculoskeletal problems faced by the sellers.

## ■ RESEARCH METHODS

Technique of purposive sampling procedure was adopted considering the research problem. The present

study was carried out in three daily markets under Tura Municipal Board, West Garo Hills District of Meghalaya. Tura Municipal Board is the only municipal board of West Garo Hills. The Hills district is bounded by Goalpara district of Assam in the North, Dhuburi district of Assam in the West, East Garo Hills district of Meghalaya in the East and Bangladesh in the South. Twenty five (25) sellers involved in vegetable selling and 25 sellers involved in fruit selling business were selected purposively for the study. Thus, a total of 50 sellers comprise the total sample of the study. Interview Schedule was formulated to collect the primary data related to socio-economic background, seller's involvement in various activities related to selling and musculoskeletal discomfort level while performing the work. To identify the incidents of musculoskeletal discomforts during the activity along with questionnaire, body map (Corlett and Bishop, 1976), was also used which indicates different body parts *viz.*, upper body parts (neck, shoulder joint etc.) and lower body parts (lower arms, low back, upper leg/ thighs etc.) for easy accessibility of the interviewee and the interviewer. To quantify the level of stress on muscle, score ranges from 0 to 5 was used *viz.*, 0 – No pain, 1 – Very mild, 2 – Mild, 3 – Moderate, 4 – Severe, 5 – Very severe. Mean and S.D. were analyzed as per the requirement of the objectives. The data were presented in tabular form in terms of frequencies, percentages and percentage of mean score. Bar and pie diagrams are used easy accessibility to the subject.

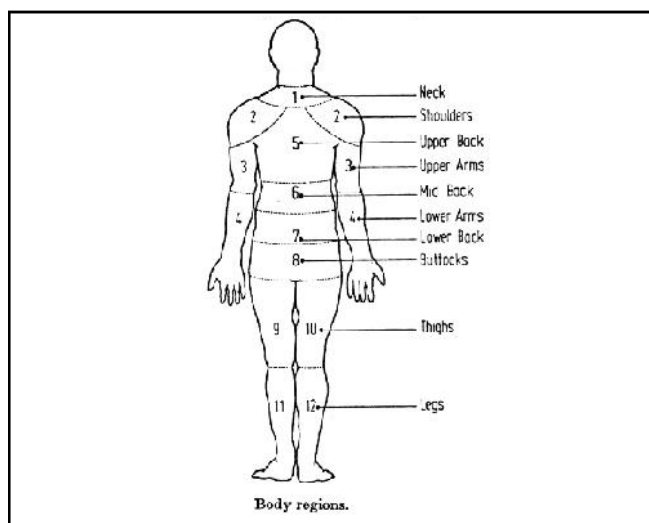


Fig. A : A technique for accessing postural discomfort

## ■ RESEARCH FINDINGS AND DISCUSSION

The findings of the present study as well as relevant discussion have been presented under following heads :

### Socio-economic background :

Analysis of the data gathered during the survey reveals that half of the sellers involved in selling of vegetable and fruits belong to the age group of 35 – 50 years (50 %) followed by the sellers belonging to the age group of 15 to 35 years (44 %). A little more than half of the sellers (58 %) are found to be male. 46 per cent of the sellers are follower of Hindu religion followed by the sellers following Christian religion (40 %). Educational qualification reveals that the majority (82 %) of the sellers can only read and writes. 76 per cent of the sellers are married. 66 per cent belongs to joint family and majority among the sellers are having more than 7 family members *i.e.*; large family size. Data related to monthly income showed that 78 per cent of the sellers are earning income ranging from 5,000 to 10,000/- (Table 1)

### Activities performed by the sellers :

It is clear from Fig.1 that cent per cent (100%) of the sellers who are involved in vegetable selling perform the activities like cleaning of the area before arranging the items for sale, collection of water for washing/cleaning of vegetables, arrangement of items for sale, sprinkling of water to make the vegetables remain good and look fresh, making of small bundles of items (like sponge/ridge gourd, coriander, leafy vegetables etc.), removal of dried/rotten parts, packing of the items after weighing, handover the packed items to buyer, repacking of the unsold items, and cleaning of the area of sale at the end of the day. The activity of weighing of the vegetable are found to be performed by 88 per cent of the sellers and 12 per cent do not perform the activity of weighing as some of the vegetable sellers sale local vegetables in bunch at fix price. Further, study of the data shows that 40 per cent of the sellers are found to perform the activity of collection of the items for sale from the source whereas 60 per cent of the sellers are not involved in this activity. Data regarding carrying to the point of sale is performed by 16 per cent of the sellers and 84 per cent of the sellers do not perform this activity. A minimum percentage (4%) of the sellers are found to perform the activities of loading and unloading the vegetables bags in and from the carrier vehicle and majority (96%) of the sellers do not perform

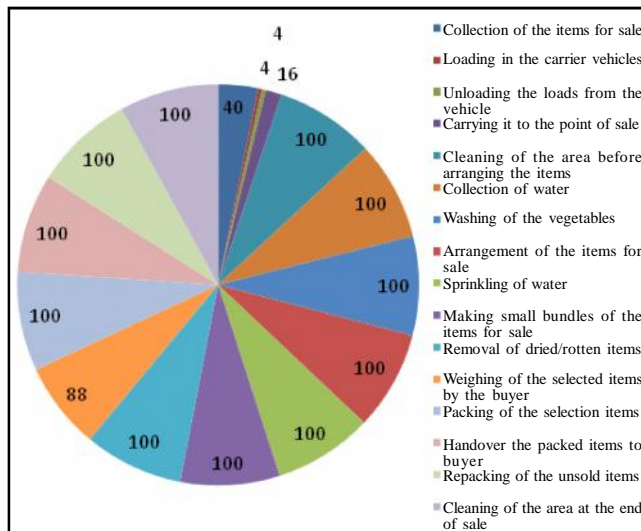
**Table 1 : Distribution of vegetable and fruit sellers according to their socio-economic background (n=50)**

Sr. No.	Characteristics	Frequency	Percentage
1.	<b>Age</b>		
	18 -35 years	22	44
	35 - 50 years	25	50
	50 years and above	3	6
2.	<b>Sex</b>		
	Male	29	58
	Female	21	42
3.	<b>Religion</b>		
	Hindu	23	46
	Muslim	7	14
	Christian	20	40
4.	<b>Educational qualification</b>		
	Illiterate	3	6
	Can read and write	41	82
	Primary school level	6	12
	Middle school level	-	-
	High school level	-	-
5.	<b>Marital status</b>		
	Unmarried	12	24
	Married	38	76
6.	<b>Type of family</b>		
	Nuclear	17	34
	Joint	33	66
7.	<b>Size of the family</b>		
	Small (2-4)	11	22
	Medium (5-7)	5	10
	Large (more than 7)	34	68
8.	<b>Monthly income</b>		
	Less than Rs.5000/-	10	2
	Rs.5000/- to 10,000/-	39	78
	Rs.10,000 and above	1	2

these activities (Fig. 1).

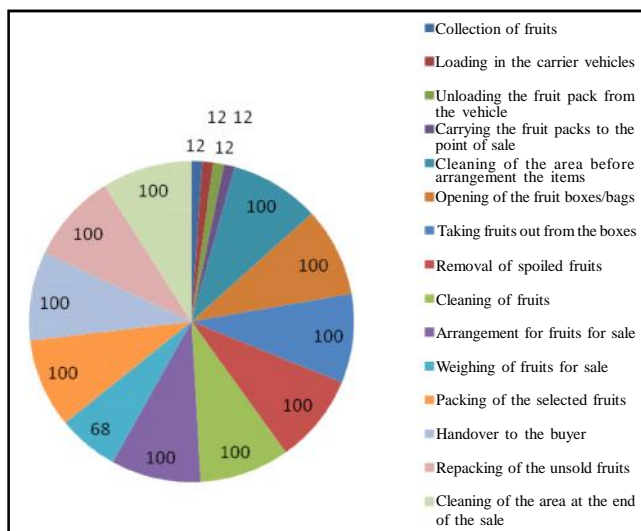
Thus, the findings related to involvement of sellers divulges that while doing the job of vegetable selling the sellers perform numerous activities and their involvement is high in more than half of the activities related to vegetables selling. The activities in which involvement is found less are mostly assisted by paid help. To perform the activities the sellers are bound to adopt various postures due to work center arrangement and also some of the activities demand repetitive motions and awkward postures.

Data presented in Fig.2 regarding involvement of sellers in activities related to selling of fruits show that cent per cent of the sellers are found involved in the activities like cleaning of area before arrangement of the items, opening of the fruits boxes, taking fruits out of



**Fig. 1 : Pie-diagram showing distribution of sellers according to performance of various activities related to vegetable selling**

the box, sorting of the fruits for sale, removal of the spoiled fruits, weighing of fruits for sale, packing of fruits after weighing, handover the packed fruits to buyer, repacking of unsold fruits, cleaning of the area at the end of the sale. Further, study of the table show that 12 per cent of the sellers perform the activities like collection of fruits from source, carrying of fruits pack, loading of fruits packs to carrier vehicle and unloading of fruits packs from the carrier vehicle and 88 per cent of the sellers do not perform these activities viz., collection of fruits,



**Fig. 2 : Pie-diagram showing distribution of respondents according to performance of various activities related to fruit selling**

carrying of fruits pack, loading of fruit packs and unloading of fruit packs. Their involvement is found lesser in these four activities as the sellers take help of daily wage labour for collection of fruits, carrying the fruit packs, loading to the carrier vehicle and unloading of the fruit packs from the vehicle.

The findings shown on Fig. 2 reveals that the sellers perform almost all the activities related to fruit selling only less involvement was observed in four of the activities. Thus, it can be concluded that fruit sellers perform various activities to sale their goods and while doing this they adopted various postures with frequent changes.

**Musculoskeletal discomfort faced by the perishable goods sellers :**

Musculoskeletal discomfort faced by the sellers in upper extremities, back and lower extremities while doing the activities related to selling of vegetables and fruits are studied by using Body Map technique.

Table 2 divulges the overall scores of pain obtained by the body parts which indicates that the respondents involved in vegetable selling felt severe pain in shoulder (62.4%), mid back (60.8%), lower back (66.4%), buttocks (66.4%), right thigh (66.4%), left thigh (66.4%), right leg (68.8%) and left leg (68.8%) and moderate pain in neck (55%), upper arm (53.6%) and lower arm (55.2%) and upper back (49.6%).

The intensity of pain felt in different body parts indicated that it requires attention. The feeling of pain in different body parts may be due to longer duration of working at awkward position like squatting posture, bending at back, sitting at low level, sitting directly on the floor with leg stretching, sitting on feet, bending at waist level, bending forward, bending at back while carrying load, carrying of load on shoulder, twisting of body while picking up vegetables arranged at different levels.

It is also apparent from the data presented in Table 2 that the fruit sellers felt severe discomfort in shoulder

**Table 2: Musculoskeletal discomfort faced by the sellers while performing the activities**

Sr. No	Body parts	Mean score $\pm$ SD	Percentage of mean of score	Overall discomfort
1.	<b>Vegetable seller</b>			
	Neck	2.76 $\pm$ 0.66	55.00	Moderate
	Shoulder	3.12 $\pm$ 0.44	62.40	Severe
	Upper arm	2.68 $\pm$ 0.62	53.60	Moderate
	Lower arm	2.76 $\pm$ 0.87	55.20	Moderate
	Upper back	2.48 $\pm$ 0.77	49.60	Moderate
	Mid back	3.04 $\pm$ 0.61	60.80	Severe
	Lower back	3.32 $\pm$ 0.69	66.40	Severe
	Buttocks	3.32 $\pm$ 0.90	66.40	Severe
	Right thigh	3.32 $\pm$ 0.69	66.40	Severe
	Left thigh	3.32 $\pm$ 0.69	66.40	Severe
	Right leg	3.44 $\pm$ 0.50	68.80	Severe
	Left leg	3.44 $\pm$ 0.50	68.80	Severe
2.	<b>Fruits sellers</b>			
	Neck	2.88 $\pm$ 0.78	57.60	Moderate
	Shoulder	3.08 $\pm$ 0.81	61.60	Severe
	Upper arm	2.64 $\pm$ 0.49	52.80	Moderate
	Lower arm	2.08 $\pm$ 0.75	41.60	Moderate
	Upper back	2.64 $\pm$ 0.56	52.80	Moderate
	Mid back	3.04 $\pm$ 0.53	60.80	Severe
	Lower back	3.60 $\pm$ 0.81	72.00	Severe
	Buttocks	3.48 $\pm$ 0.51	69.60	Severe
	Right thigh	2.36 $\pm$ 0.49	47.20	Moderate
	Left thigh	2.36 $\pm$ 0.49	47.20	Moderate
	Right leg	2.52 $\pm$ 1.19	50.40	Moderate
	Left leg	2.52 $\pm$ 1.19	50.40	Moderate

Overall Discomfort Score attained: Very mild = Upto 20%, Mild = 20-40%, Moderate = 40 – 60%, Severe = 60 – 80%, Very Severe = >80%



Fig. 3 : Working in awkward posture



Fig. 5 : Carrying of heavy load in back



Fig. 4 : Working in forward bending posture



Fig. 6 : Working in twisted body position

(61.6%), mid back (60.3%), lower back (72%) and buttocks (69.6%) and moderate pain in neck (57.6%), upper arm (52.8%), lower arm (41.6%), upper back (52.8%), right thigh (47.2%), left thigh (47.2%), right leg (50.4%) and left leg (50.4%).

It is evident from the findings that the fruit sellers while performing the activities related to selling felt severe discomfort in shoulder, mid back, lower back and buttocks due to frequent movement of hands and raising of hands at shoulder level to take out the fruits from the stacks where fruits are arranged at different level and twisting of body towards back and sides (Corlett, 1976).

**Conclusion:**

From the findings of the study it can be concluded that the sellers involved in vegetable and fruit sellers performs various activities till completion of the process

of selling of the goods to the ultimate users. While doing so different body postures are adopted and many of which are awkward. Due the awkward postures the sellers perceive different level of pain in various parts of the body. If the same is not prevented in the early stage through ergonomic intervention then it may lead to musculoskeletal disorder at a later stage. Thus, the findings of the study will help the ergonomist to provide them with proper training on work postures and proper organization of work environment which will help the sellers to maintain good health status while serving the family in particular and society in general.

**REFERENCES**

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