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### Occupational health problems of women workers while performing turmeric cultivation activities in Punjab

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#### Abstract

Turmeric is one of the most important spice predominantly used in the every households. This is also known as *haldi* or golden spice. It is the main ingredient in Indian cuisine and used for flavouring. It also has high medicinal values. In Punjab, it has been observed that turmeric is being cultivated by farmers as an inter crop. Women play a major role in different activities which are being done manually. This involves lots of time and physical effort by the women workers. Keeping this view a research was conducted to study the existing practices and extent of involvement of women workers in harvest and post-harvest activities of turmeric crop and to identify the occupational health problems of women workers in harvest and post-harvest activities of turmeric cultivation in Hoshiarpur, Jalandhar and Ludhiana districts of Punjab. Data were collected through primary sources while performing harvesting and post-harvest activities of turmeric crop. Results revealed that all of the women workers (100.00%) participated in harvesting, separating finger rhizome from mother rhizome, drying, cleaning, grading & sorting, packaging (packing and sealing) and storage activities. Most of the tasks were seasonal and take lots of time and physical effort responsible for drudgery and health hazards. In almost all the activities body parts such as upper arm, lower arm, palm, fingers, shoulder, neck, head, upper and lower back were used repeatedly and forcefully. The effects of repeated and forceful activities create negative impact on body parts and gradually develop musculoskeletal problems and related injuries. It was found that women workers complained discomfort in lower arm which got maximum mean score with score 4.27 followed by upper arm (4.13), lower arm (4.08), right hand (4.01), shoulder joint (3.87) and upper back (3.81) Lesser pain was perceived in knees (3.68), legs (3.51), ankle (3.46). It is very much important to address various occupational health problems of women workers involved in turmeric cultivation activities. This study suggested for further suitable ergonomic interventions of women friendly technologies and personal protective equipments to reduce occupational health problems of women workers in Punjab.

**Keywords:** Turmeric, women workers, harvesting post-harvest activities, health, problems

#### Introduction

India is the one of the world's largest producers, consumer and exporters of spices. Spices are considered as major source of livelihood of smallholder farmers in India. Turmeric is one of the most important spices which is predominantly used by the every households. This is also known as *haldi* or golden ginger or spice of life. This flavorful powder used for centuries as a natural coloring agent in food cosmetic and textiles as a flavoring compound and also as an insect repellent in Indian medicine. It is the main ingredient in Indian cuisine, and it is used for flavouring and colouring. It also has, anti-cancer, anti-inflammatory and anti-viral properties and being utilized in the pharmaceutical and cosmetic industries due to its high medicinal values. Turmeric is also used as major ingredient in different religious and ceremonial activities in India. India is the largest producer of turmeric (*Curcuma longa*) in the world (80%). In Punjab, it has been observed that turmeric is being cultivated by farmers as an inter crop and also to bring diversification among crops. It also gives good

monetary values to the farmers and encourages them to adopt this farming as it requires organic practices. In present scenario, the farmers are looking for a new cropping pattern with high valued crops so that household income increases. In the production of spices or seed spices women's participation is much more as compared to men. Work as frontline workers in most of the turmeric growing states in India. In case of turmeric cultivation, women actively participate in land preparation, planting, mulching, manuring, harvesting and post-harvest operations. They play a major role in the post-harvest activities such as sorting, grading, boiling, drying, polishing, grinding etc. are being done manually. Women's role in harvest and post-harvest activities of turmeric can't be ignored because they work as frontline workers in most of the turmeric growing states in India. These are drudgery prone, hazardous and take lots of time to complete the task. This involves lots of time and physical effort of the women workers engaged in these activities.

Keeping this view a study was conducted in major turmeric production districts such as Hoshiarpur, Jalandhar and Ludhiana districts of Punjab where women actively participate in turmeric cultivation. The objectives of this research were to study the existing practices and extent of involvement of women workers in harvest and post-harvest activities of turmeric crop in Punjab and to identify the occupational health problems of women workers in post-harvest activities of turmeric cultivation in Punjab

### Methodology

The study was conducted to determine the problems of women working in the turmeric cultivation in Hoshiarpur, Jalandhar and Ludhiana districts of Punjab. The sample size was 150 and simple random sampling was done to select women workers. Structured interview schedule developed and used for data collection. Questions were also asked on their feelings and perception at work. Data pertaining to existing practices followed by women workers in performing harvest and post-harvest activities were recorded through primary and secondary sources.

### Personal profile of the women workers while performing turmeric cultivation activities in Punjab

The personal profile of the women workers in turmeric cultivation were collected from Punjab. It was found that about 36.67 per cent women workers belonged to the age group of 40 to 49 years followed by 50 and above (33.33 %) 30 to 39 years (20.67%) and 20 to 29 years (9.33%). About 34.67 percent women workers had primary education, followed by middle school (23.33%), high school (4.67%), intermediate (2.67 %) and 12.00 per cent women were illiterate and 22.67 were functionally literate. It was found that majority of the women workers were having nuclear family (82.67 %). More than half of the women workers (58.67%) were belonged to general category followed by schedule caste (26%) category and other backward caste category (15.33%). The status on land holdings revealed that 56 per cent of the women workers were landless. About 38.67 per cent were marginal farmers. There were very less number of women workers belonged to the small, medium and large farmers' category. The data pertaining to annual income revealed that 42.00 per cent of the women workers had annual income in between Rs.60 000 -/ to 80 000/- followed by 23.33 per cent of the women workers had income about Rs. 40000 / - to 60000/-, about 21.33 per cent were having income about Rs. 80000/- to Rs. 100000/-.

### Work profile of the women workers while performing turmeric cultivation activities in Punjab

The work profile of the women workers in turmeric cultivation revealed that most of the workers were agricultural labourers (56%) followed by cultivator (38.00 %) and land owners (6.00 %) in Punjab. All of the women workers were working seasonally whereas about 56 per cent were working in the daily basis at processing centers. All of the women workers were working from 9 am to 5pm at both the states and they were doing overtime of 2 hours during peak period. Women workers were getting two breaks ranging 30mins to 45 minutes (40%) more than 45 minutes (60%). The time schedule of work of women workers revealed that they work for 8-10 hours per day from

morning 8.30 am to evening 4.30. PM was (58%) followed by 6-8 hours per day (42%).

### Existing harvest and post-harvest practices by the women workers while performing turmeric cultivation activities in Punjab

The data pertaining to existing harvest and post-harvest practices in turmeric cultivation and involvement of women workers were collected through structured interview schedule. It revealed that all of the women workers (100.00%) participated in harvesting, separating finger rhizome from mother rhizome, drying, cleaning, grading & sorting, packaging (packing and sealing) and storage activities. About 56.67 per cent of them were doing boiling in traditional process whereas 45.33 per cent women workers carry turmeric from field to storage place. Most of the tasks were seasonal and take lots of time and physical effort responsible for drudgery and health hazards. Some of the women workers involved in large production of turmeric did polishing, grinding etc. in daily/ weekly basis. Maximum time consumed in separating rhizomes harvesting, gathering, drying (8 to 10 hrs/day) followed by rest of the activities took 6 to 8 hours except boiling and marketing (2-4 hrs/day) in Punjab. It was evident that in most of the activities static awkward postures and repetitive movements were adopted by the women workers by adopting sitting, squatting, bending and twisting of body parts. These prolonged awkward posture leads to musculoskeletal problem in the long run and also responsible for occupational health problems and also hazards. Similarly, Zend *et al* (2019) <sup>[16]</sup> also confirmed that in turmeric cultivation, women workers participated in planting of rhizomes, weeding, harvesting and cleaning activities. Most of the procedures such as planting, earthing up, harvesting in turmeric production system were manually done.

### Nature of work as perceived by the women workers while performing turmeric cultivation activities in Punjab

The nature of work as perceived by the women workers involved in turmeric cultivation were collected through participatory observation methods. The data revealed that except harvesting (50.00 %) and carrying produces (33.33%) all of the post-harvest activities such as separating finger rhizome from mother rhizome, drying, cleaning, grading & sorting, packaging and storage were considered as repetitive task and forceful activities as perceived by the women workers. In almost all the activities body parts such as upper arm, lower arm, palm, fingers, shoulder, neck, head, upper and lower back were used repeatedly and forcefully. The effects of repeated and forceful activities create negative impact on body parts and gradually develop musculoskeletal problems and related injuries. Nag *et al* (2004) <sup>[10]</sup> supported from their study that in agriculture, the post-harvest operations, by their very nature, include crop gathering and removal, which require the use of manual and mechanical winnowing, raking, shelling, decortications, hulling, peeling, cutting, slicing, fiber extraction, etc. Many of the post-harvest operations have traditionally been performed on the farm itself, by labour intensive methods, and with a very low output.

**Table 1:** Existing harvest and post-harvest practices by the women workers while performing turmeric cultivation activities in Punjab

Activities	(f)	(%)	Work Duration (hrs/day)
Harvesting	150	100.00	8 to 10
<b>Post-harvest activities</b>			
Separating finger rhizome from mother rhizome	150	100.00	8 to 10
Collection of rhizomes	150	100.00	8 to 10
Carrying Produce from farm to home	68	45.33	6 to 8
Boiling/ curing	85	56.67	4
Drying	150	100.00	8 to 10
Polishing	20	13.33	2 to 4
Cleaning	150	100.00	6 to 8
Grading and sorting	150	100.00	8 to 10
Storage	150	100.00	2
<b>Processing and Packaging</b>			
Grinding	105	70.00	6 to 8
Sieving	105	70.00	6 to 8
Packaging	105	70.00	6 to 8
Marketing	72	48.00	2 to 4

### Difficulty level of tasks perceived by women workers while performing turmeric cultivation activities in Punjab

The difficulty level of tasks perceived by women workers in turmeric cultivation were collected through participatory observations, discussions and documentations. It was scored ranging from 1-5 such as very difficult -5, difficult -4, normal-3, easy-2, very easy-1 and calculated mean scores

and ranked the activities accordingly. It was found that separating finger rhizome from mother rhizome was perceived most difficult task involved repetitive movements of upper and lower arms for longer periods with mean score 4.01 followed by boiling (3.89), harvesting (3.87) and carrying produce from farm to home (3.57). Polishing, sieving and coloring were not done by the women workers of Punjab.

**Table 2:** Difficulty level of tasks perceived by women workers while performing turmeric cultivation activities in Punjab

Activity	Mean Score	Rank
Harvesting	3.87	III
Separating finger rhizome from mother rhizome	4.01	I
Gathering	2.87	X
Carrying Produce from farm to home	3.57	IV
Boiling/ curing	3.89	II
Drying	2.94	VIII
Polishing	0.24	XI
Sieving	0.24	XI
Grading and sorting	3.23	VI
Storage	3.00	VII
Grinding	3.00	VII
Straining	2.91	IX
Packaging	3.26	V
Marketing	3.00	VII

### Problems faced by women workers while performing turmeric cultivation activities in Punjab

The problems faced by women workers at workplace in turmeric cultivation were collected through structured interview schedule and participatory observation methods. Mean scores for occurrence of problems were calculated and ranked. The mean score for physical problem were identified and revealed that strain in eyes (2.33) body ache (2.29), skin allergies (1.74) and headache (1.52) were the major problem. Joint pain and tiredness (2.27) were having equal score followed by the other symptomatic problems such as e muscle tightness (2.10), stiffness (1.78) and

numbness in hands (1.73). Bending and lifting (3.0) were the most awkward posture responsible for health issues. Forgetfulness (2.51) followed by too much workload (2.28), lack of enthusiasm (2.10), job insecurity (2.0) and stress due to dual role (1.92) were the major psychological problems. Exertion due to heavy lifting (2.18) and long walk due to distance workplace were other work-related problems also had been observed. Mehta *et al* (2015) reported similar results related to health hazards such as cuts and abrasions due to pricking of dry straw threshing of mustard and all of the women workers reported irritation in eyes and followed by throat, nose & ears due to the dust.

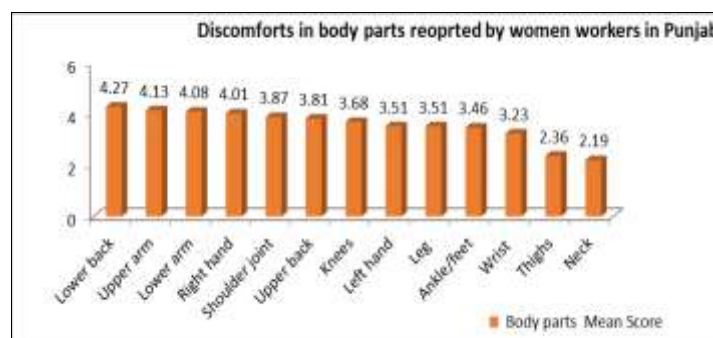
**Table 3:** Occupational health Problems faced by women workers while performing turmeric cultivation activities at workplace in Punjab (n=150)

Occupational Health Problem	Mean Score	Rank
<b>a) Physical problem</b>		
Strain on eyes	2.30	I
Body ache	1.99	II
Skin allergies	1.74	III
Headache	1.51	IV
Fever	1.27	V
Gastrointestinal disorder	1.20	VI
<b>b) Symptomatic problems</b>		
Joint pain	2.27	I
Tiredness	2.27	I
Muscles tightness	2.10	II
Joint stiffness	1.78	III
Numbness of arms /hand	1.73	IV
<b>c) Difficulty in postures</b>		
Bending	3.00	I
Lifting	3.00	I
Moving	1.99	II
Standing	1.44	III
<b>d) Psychological problems</b>		
Forgetful	2.51	I
Heavy workload	2.28	II
Lack of enthusiasm	2.10	III
Job insecurity	2.00	IV
Irritation	1.92	V
Dual role stress	1.92	V
Poor work environment	1.35	VI
Low motivation	1.30	VII
Anxiety	1.29	VIII
Depression	1.17	IX
Low self confidence	1.19	X
Increased negativity	1.14	XI
<b>e) Work related problems</b>		
Exertion due to lifting heavy weight	2.18	I
Distant workplace	1.73	II
Uncomfortable working climate	1.37	III
Peak time pressure	1.28	IV

**Body Part Discomfort of women workers while performing turmeric cultivation activities at workplace in Punjab**

Corlett and Bishop’s developed Body part discomfort scale was used for survey of symptoms that assess the respondent’s experience of discomfort at various body parts. The overall level of discomfort experienced by the worker was done by summation of all the individual sensations through the various sense channels. It helped to find out the physical discomfort by asking them for rating the amount of discomfort for each specific body parts. In case of Punjab, it was found that women workers complained discomfort in

lower arm which got maximum mean score with score 4.27 followed by upper arm (4.13), lower arm (4.08), right hand (4.01), shoulder joint (3.87) and upper back (3.81) Lesser pain was perceived in knees (3.68), legs (3.51), ankle (3.46), thighs (3.23), and neck (2.19). The discomfort in body parts were perceived due to the adoption of static awkward postures and repetitive motions of upper and lower limbs while performing various tasks in turmeric cultivations. Similarly Murthy (2013) found that there were discomforts of different body parts of the farm women working in the agriculture field and dairy farm.



**Fig 1:** Body Parts Discomfort of women workers while performing turmeric cultivation activities at workplace in Punjab

### Conclusion

It can be concluded that women involved harvesting and post-harvest activities of turmeric included very tedious tasks and repetitive movements of upper and lower limbs. They adopted awkward postures such as static squatting, bending, sitting, stooping postures which create musculoskeletal problems in the long run. They were facing different physical, psychological, symptomatic and work related problems which need to be taken care of the land owners, employers and researchers. They were using traditional tools and implements which were not suitable with women's perspective. These also needed physical efforts which are responsible for drudgery. Therefore, intervention of women friendly technologies can be done by considering the anthropometric parameters of women workers of Punjab. Post-harvest losses have also been observed due to lack of facilities for boiling, peeling, drying, polishing and grinding of turmeric. This study suggested for further ergonomic evaluation of each activities to recommend suitable interventions of technologies which can help women to overcome the time-consuming and physically demanding activities. It will also thereduce the occupational health problems of women workers involved in turmeric cultivation activities in Punjab.

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