

Assessment of Discomfort and Strain among Floriculture Workers

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Abstract— The floriculture sector generates employment opportunities for the uneducated, unskilled, poor and mainly people who are marginalized from other employment opportunities. Floriculture is considered as one of the hazardous occupation as it involves the repetitive nature of tasks, heavy workload, adverse environmental conditions and poor tools and equipments. The objectives of the present study were (1) Assessment of the working profile of workers engaged in different floriculture activities and (2) Assessment of discomfort and repetitive strain faced by the workers engaged in floriculture activities. The results from present study revealed that out of the total pooled sample, majority of the respondents were involved in flower picking activity. Approximate fifteen percent (13.24) of the respondents were working 7-9 hours per day in floriculture units. It was found that the maximum discomfort was faced by the respondents during flower picking activity (WMS 3.75) and the repetitive strain was also found highest for the picking activity (WMS 3.34) in Marigold farm units.

Keywords— Floriculture, Flower Picking, Pruning, Repetitive Strain, Working profile.

I. INTRODUCTION

Floriculture work is physically demanding which includes activities that vary according to the seasonal needs for land preparation, planting, pruning, harvesting and transportation. Floriculture workers are exposed to a number of occupational health hazards that are potentially harmful to their health and well being. Occupational health hazards are also related to the activities which includes the repetitive nature of work and prolonged awkward posture of the workers. The floriculture operations need repetitive movements in awkward posture for longer duration which may cause severe health problems. Physical discomfort also affected by the working conditions such as working environment and working profile which impose additional stress on floriculture workers. Floriculture workers who maintain static awkward body postures with repetitive working movements and heavy lifting for prolonged periods can suffer from resulting muscle contractions and from alteration of the peripheral, vascular and nervous systems. Repetitive movements are more common in tasks that require manual dexterity (Henao and Samuel, 2011). Workneh (2007) conducted a study on working conditions of workers engaged in flower farm and revealed that due to long hours of standing

posture of workers leads to various health and safety problems such as headache, skin rushes, blood vein problems and respiratory problems. The National Research Council and Institute of Medicine (2001) defines work related illness or disease as being caused by aggravated, accelerated or exacerbated by workplace exposures, which results in impaired work capacity. Physical discomfort and repetitive strain are increasingly recognized as significant hazards of floriculture occupation. The knowledge about suitable working conditions, work posture, effective rest pause etc. are required for combating physical discomfort and enhancing the occupational health and safety of floriculture workers. Thus, the present study was undertaken with the following objectives (1) Assessment of the working profile of workers engaged in different floriculture activities and (2) Assessment of discomfort and repetitive strain faced by the workers engaged in floriculture activities.

II. METHODOLOGY

Six floriculture units were randomly selected from the district of Haryana state of India where floriculture was being done at large scale. All the floriculture workers

working in selected six floriculture units interviewed using the developed interview schedule for data collection. The data were suitably coded, tabulated and statistically analyzed to draw meaningful inferences.

III. RESULTS

1. Working profile of workers engaged in floriculture activities

Type of work performed by the respondents- Table 1 illustrates the type of work performed by the respondents engaged in different activities in floriculture units. It was revealed that out of the total pooled sample, majority (86.76%) of the respondents were involved in flower picking activity, 41.18 percent of the respondents were involved in planting activity and 30.88 percent of the respondents were involved in manuring activity. A same number (26.47%) of the respondents were involved in land preparation and pruning activities; 17.65 percent of the respondents were involved in packing activity. The involvement of respondents in irrigation as well as in transportation activity was 14.71 percent. More than ten (11.76%) percent of the respondents were involved in storage activity in floriculture units. Overall data as well as district wise data indicate that majority of the respondents were engaged in flower picking activity in floriculture units.

Mode of journey to go to floriculture unit- Majority (76.47%) of the respondents used to go to floriculture unit on foot while only 17.65 percent of the respondents were using bicycle to go to floriculture unit and very few 5.88 percent of the respondents were using bike to go to floriculture unit.

Distance traveled to go to floriculture unit- Table 1 reveals that one to two kms distance was travelled by the 41.18 percent of the respondents to go to floriculture unit followed by two to three kms distance (29.41%) and three to four kms distance (29.41%).

Working years in floriculture unit- Data in table 1 indicated that 51.47 percent of the respondents were working in floriculture units from one to three years followed by 35.29 percent of the respondents were working from four to six years and 13.24 percent of the respondents were working from seven to nine years. In Panipat district, maximum (64.29%) numbers of the respondents were working in floriculture units from one to three years while only 4.76 percent of the respondents were working from seven to nine years in Fatehabad district.

Working days- More than half (55.88%) of the respondents were working 25 to 30 days in a month, 33.82 percent of the respondents were working 20 to 25 days and only 10.30 percent of the respondents were working 15 to 20 days in a month. Maximum (64.29%) number of the respondents working 25 to 30 days in a month were from Panipat district and minimum (3.57%) number of the respondents working 15 to 20 days in a month were also from Panipat district.

Daily working hours- Findings in table 1 reveal that 66.17 percent of the respondents were working 4-6 hours per day, 20.59 percent of the respondents were working 7-9 hours per day and only 13.24 percent of the respondents working 7-9 hours per day in floriculture units. The maximum (78.95%) number of the respondents working 4-6 hours per day were from Hisar district and minimum (5.26%) number of the respondents were working 4-6 hours per day were from Hisar district.

Work shifts- Results in table 1 depict that 67.65 percent of the respondents were working in a single shift while 32.35 percent of the respondents were working in double shifts.

Length of work shifts- Data in table 1 also reveal the length of each work shift. In shift I, 69.12 percent of the respondents were working for 180-300 minutes and 30.88 percent of the respondents were working for 300-420 minutes while in shift II, 27.94 percent of the respondents were working for 120-240 minutes per day and only 7.35 percent of the respondents were working for 240-360 minutes per day.

Work period time- Majority (77.94%) of the respondents were working from 5a.m. to 9 a.m., 38.24 percent of the respondents were working from 9a.m. to 1p.m and 32.35 percent of the respondents were working from 2p.m. to 6p.m. District wise data also reveal that majority of the respondents were working from i.e. 5a.m. to 9 a.m.

Rest periods- Results in table 1 indicate that majority of respondents (63.24%) were allowed to take rest during work shifts and 36.76 percent of the respondents were not allowed to take rest during work. Majority (69.77%) of the respondents were taking only one rest period and 30.23 percent of the respondents were taking two rest periods in between the work. Overall data as well as district wise data indicate that majority of the respondents were taking only one rest period in between the work.

Length of the rest periods- In shift I, 48.84 percent of the respondents were taking rest for fifteen minutes and 20.93 percent of the respondents were taking rest for twenty

minutes in between work whereas in shift II, 16.28 percent of the respondents were taking rest for 90 minutes and 13.95 percent of the respondents were taking rest for 120 minutes while working.

Rest period time- Results in table 1 also indicate the time for rest periods. In shift I, 16.28 percent of the respondents were taking rest in time period of 7a.m. to 7.15a.m. followed by 13.95 percent in time period of 8a.m. to 8.15a.m., 11.63 percent in time period of 9a.m. to 9.15a.m. and 6.98 percent

of the respondents were not having any specified rest period time as they might take rest whenever they felt need to take rest. For 30 minutes rest period time in shift I, 20.93 percent of the respondents were taking rest in time period of 10am to 10.30am. In shift II, 16.28 percent of the respondents were taking rest in time period of 12noon to 2p.m. and 13.95 percent of the respondents were taking rest in time period of 12noon to 1.30 p.m.

Table 1 Working profile of workers engaged in floriculture activities (n=68)

Parameters	Fatehabad (n=21)	Hisar (n=19)	Panipat (n=28)	Total (n=68)
Type of work performed by the respondents*				
Land preparation	5 (23.81)	3 (15.79)	10 (35.71)	18 (26.47)
Planting	8 (38.10)	5 (26.32)	15 (53.57)	28 (41.18)
Manuring	7 (33.33)	3 (15.79)	11 (39.29)	21 (30.88)
Irrigation	2 (9.52)	2 (10.53)	6 (21.43)	10 (14.71)
Picking	19 (90.48)	17 (89.47)	23 (82.14)	59 (86.76)
Pruning	6 (28.57)	3 (15.79)	9 (32.14)	18 (26.47)
Packing	4 (19.05)	3 (15.79)	5 (17.86)	12 (17.65)
Storage	2 (9.52)	2 (10.53)	4 (14.29)	8 (11.76)
Transportation	4 (19.05)	3 (15.79)	3 (10.71)	10 (14.71)
Mode of journey				
On foot	11 (52.38)	16 (84.21)	25 (89.29)	52 (76.47)
bicycle	7 (33.33)	2 (10.53)	3 (10.71)	12 (17.65)
Bike	3 (14.29)	1 (5.26)	-	4 (5.88)
Distance traveled to reach floriculture unit (km)				
1-2	6 (28.57)	10 (52.63)	12 (42.86)	28 (41.18)
2-3	10 (47.62)	6 (31.58)	4 (14.28)	20 (29.41)
3-4	5 (23.81)	3 (15.79)	12 (42.86)	20 (29.41)
Number of working years in floriculture unit				
1-3	13 (61.91)	4 (21.05)	18 (64.29)	35 (51.47)
4-6	7 (33.33)	10 (52.63)	7 (25.00)	24 (35.29)
7-9	1 (4.76)	5 (26.32)	3 (10.71)	9 (13.24)
Average working days in a month				
15-20	2 (9.52)	4 (21.05)	1 (3.57)	7 (10.30)

20-25	8 (38.10)	6 (31.58)	9 (32.14)	23 (33.82)
25-30	11 (52.38)	9 (47.37)	18 (64.29)	38 (55.88)
Average working hours daily				
2-3	8 (38.10)	1 (5.26)	-	9 (13.24)
4-6	9 (42.85)	15 (78.95)	21 (75.00)	45 (66.17)
7-9	4 (19.05)	3 (15.79)	7 (25.00)	14 (20.59)
Number of work shifts/day				
One	17 (80.95)	7 (36.84)	22 (78.57)	46 (67.65)
Two	4 (19.05)	12 (63.16)	6 (21.43)	22 (32.35)
Length of each work shift period (Minutes)				
Shift I				
180-300	18 (85.71)	14 (73.68)	15 (53.57)	47 (69.12)
300-420	3 (14.29)	5 (26.32)	13 (46.43)	21 (30.88)
Shift II				
120-240	3 (14.29)	10 (52.63)	4 (14.29)	19 (27.94)
240-360	1 (4.76)	2 (10.53)	2 (7.14)	5 (7.35)
Time of work shift (period)*				
5am to 9 am	17 (80.95)	13 (68.42)	23 (82.14)	53 (77.94)
9 am to 1pm	11 (52.38)	6 (31.58)	9 (32.14)	26 (38.24)
2pm to 6 pm	4 (19.05)	12 (63.16)	6 (21.43)	22 (32.35)
Rest in between each work shift				
Rest period allowed				43 (63.24)
Rest period not allowed				25 (36.76)
Number of rest periods/day				
One	9 (69.23)	15 (78.95)	6 (54.55)	30 (69.77)
Two	4 (30.77)	4 (21.05)	5 (45.45)	13 (30.23)
Length of each rest period (Minute)				
Shift I				
15	6 (46.15)	11 (57.90)	4 (36.36)	21 (48.84)
30	3 (23.08)	4 (21.05)	2 (18.18)	9 (20.93)
Shift II				
90	3 (23.08)	2 (10.526)	1 (9.09)	6 (13.95)
120	1 (7.69)	2 (10.526)	4 (36.36)	7 (16.28)
Time of rest periods				
Shift I (15min)				

7am to 7.15am	3 (23.08)	3 (15.79)	-	6 (13.95)
8am to 8.15am	2 (15.38)	5 (26.32)	-	7 (16.28)
9am to 9.15am	-	-	3 (27.27)	3 (6.98)
Not specified	1 (7.69)	3 (15.79)	1 (9.09)	5 (11.63)
Shift I (30min)				
10am to 10.30am	3 (23.08)	4 (21.05)	2 (18.18)	9 (20.93)
Shift II (90min)				
12noon to 1.30 pm	3 (23.08)	2 (10.526)	1 (9.09)	6 (13.95)
Shift II (120min)				
12noon to 2pm	1 (7.69)	2 (10.526)	4 (36.36)	7 (16.28)

Figures in parenthesis indicate percentage

*Multiple responses

2. Assessment of discomfort and repetitive strain of workers engaged in floriculture activities

The discomfort and repetitive strain of workers engaged in floriculture activities was presented in table 2.

Table 2. Discomfort and repetitive strain faced by the workers in different floriculture activities (n=68)

Sr. No.	Activities	Marigold farm		Rose farm	
		WMS	Rank	WMS	Rank
Discomfort rating*					
1.	Land preparation	2.00	VII	2.75	V
2.	Planting	2.58	IV	2.89	IV
3.	Manuring	2.60	III	2.64	VI
4.	Irrigation	2.17	VI	2.00	VII
5.	Picking	3.75	I	3.63	II
6.	Pruning	NA	NA	3.67	I
7.	Packing	2.43	V	3.00	III
8.	Storage	3.00	II	2.00	VII
9.	Transportation	3.00	II	2.00	VII
Repetitive strain rating**					
1.	Land preparation	3.10	III	2.25	V
2.	Planting	2.79	IV	2.78	II
3.	Manuring	2.70	V	2.55	IV
4.	Irrigation	2.67	VI	1.25	VII
5.	Picking	3.34	I	3.44	I

6.	Pruning	NA	NA	3.44	I
7.	Packing	3.00	II	2.67	III
8.	Storage	1.50	VII	2.00	VI
9.	Transportation	1.50	VII	2.00	VI

*5= Very severe, 4= Severe, 3= Moderate, 2= Mild, 1= Very mild

**5= Very exhausted, 4= Exhausted, 3= Moderately exhausted, 2= Mildly exhausted, 1= Comfortable

Discomfort faced by the respondents- The finding in Table 2 highlights discomfort faced by the respondents engaged in Marigold farm units. The maximum discomfort was faced by the respondents during picking activity with weighted mean score of 3.75 followed by storage and transportation having weighted mean score of 3.00, manuring having weighted mean score of 2.60, planting having weighted mean score of 2.58, packing having weighted mean score of 2.43, irrigation having weighted mean score of 2.17 and land preparation having weighted mean score of 2.00. Table 2 further reveal that the respondents engaged in Rose farm unit were facing severe discomfort while pruning activity (weighted mean score 3.67) as the pruning activity required repetitive movements with high force for longer time. The discomfort rating in terms of weighted mean score in Rose farm units for picking activity was 3.63 followed by packing (weighted mean score 3.00), planting (weighted mean score 2.89), land preparation (weighted mean score 2.75) and manuring (weighted mean score 2.64). The least (2.00) weighted mean score was found in irrigation, storage and transportation which indicates that mild discomfort was faced during these activities by the respondents working in Rose farm units.

Repetitive strain faced by the respondents- The repetitive strain of the respondents in terms of weighted mean score was presented in table 2 and it was found that the repetitive strain was maximum (WMS 3.34) for picking activity in Marigold farm units followed by packing (WMS 3.00), land preparation (WMS 3.10), planting (WMS 2.79), manuring (WMS 2.70) and irrigation (WMS 2.67). The weighted mean score (1.50) of storage and transportation indicates that the respondents working in Marigold farm units in these activities were mildly exhausted in terms of repetitive strain. Respondents engaged in Rose farm units were facing maximum repetitive strain in picking and pruning activities with weighted mean score of 3.44 followed by planting (WMS 2.78), packing (WMS 2.67), manuring (WMS 2.55) and land preparation (WMS 2.25). In storage and transportation, respondents engaged in Rose farm units were

mildly exhausted in terms of repetitive strain as weighted mean score for both activities was 2.00.

IV. DISCUSSION

Working profile of workers engaged in floriculture activities: Flower picking was the activity in which maximum percentage (86.76%) of the respondents were as compared comparing to the other activities in floriculture farms. Thippaiah (2005) reported that among all floriculture activities, maximum number of employment was found in harvesting activity. When compared to other field crops and horticultural crops, used to the higher employment generation was found in the cultivation of flowers and flower picking activity accounted the continuous requirement of labour. In the present study, majority (76.47%) of the respondents were go to floriculture unit on foot and the minimum distance travelled by the respondents (41.18 %) was one to two kms and maximum distance travelled by the respondents (29.41%) was three to four kms. Workers were working in floriculture units from one to nine years. Most of the respondents (55.88%) were working 25 to 30 days in a month and the daily working hours of respondents (66.17%) in floriculture units were 4-6 hours whereas 13.24 percent of the respondents were working for 7-9 hours per day in floriculture units. There were two work shifts and 67.65 percent of the respondents were working in a single shift while 32.35 percent of the respondents were working in double shifts. In shift I, respondents were working for 180-420 minutes while in shift II respondents were working for 120 -360 minutes per day. Majority (77.94%) of the respondents were working in morning time as flower picking activity was done mainly in morning time and majority of the workers were engaged in flower picking activity. Thippaiah (2005) also reported that the flowers were plucked between 6 am and 12 noon. In present study, majority of the respondents (63.24%) were allowed to take rest during work shifts but 36.76 percent of the respondents were not allowed

to take rest while working. Overall data as well as district wise data indicated that majority of the respondents who were allowed to take rest were allowed to take only one rest period in between the work. In shift I, rest periods were allowed for fifteen and twenty minutes in between work whereas in shift II, rest periods were allowed for 90 minutes and 120 minutes while working.

Assessment of discomfort and repetitive strain of workers working in floriculture activities: Results highlighted that in Marigold farm units, the maximum discomfort was faced by the respondents during picking activity followed by storage and transportation, manuring, planting, packing, irrigation and land preparation. It was further revealed that the respondents engaged in Rose farm units were facing severe discomfort during pruning activity as the pruning activity required repetitive movements with high force for longer time followed by packing, planting, land preparation, and manuring. Repetitive strain faced by the respondents in different floriculture activities was maximum for picking activity in Marigold farm units followed by packing, land preparation, planting, manuring and irrigation. Respondents engaged in Rose farm units were facing maximum repetitive strain in picking and pruning activities. Reason behind the same could be that picking and pruning activities required either forward bending or standing with raised arms for longer duration. The repetitive nature of picking and pruning activity lead to repetitive strain problems.

V. CONCLUSION

Overall data as well as district wise data indicate that majority of the workers were engaged in flower picking activity in floriculture units. Majority (76.47%) of the respondents used to go to floriculture unit on foot. One to two kms distance was travelled by the 41.18 percent of the respondents to go to floriculture unit and more than half of the respondents were working 4-6 hours per day. Floriculture workers were working in single shift as well as in double shifts. A large number of workers (36.76%) were not allowed to take rest during work. Overall data as well as district wise data indicate that majority of the workers were taking only one rest period in between the work while 48.84 percent of the workers were taking rest only for fifteen minutes. The maximum physical discomfort and repetitive strain was faced during picking and pruning activity by the workers.

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