

## Prevalence of hand discomfort among Florists: An Ergonomic Study

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### ABSTRACT

**Aim:** Floral crafting is a highly repetitive and precision job involving tasks like sorting, trimming, sewing, styling and assembling of flowers with the use of varied tools like needles, scissors and knives, among others. **Objective:** To explore the prevalence of work-related hand discomfort among florists in the informal sector of Mumbai and its suburbs. This study aimed to explore the prevalence of work-related hand discomfort among florists in the informal sector. **Methods:** A hundred and twenty florists involved in making real flower garlands, jewellery and bouquets were purposely selected as samples for the study from Mumbai city and its suburbs. Prevalence of musculoskeletal discomfort was assessed using Cornell's Musculoskeletal Hand Discomfort Questionnaire. **Results:** The study indicated significant prevalence of hand discomfort among florists engaged in garland, jewellery and bouquet making in the unorganized sector of Mumbai. All florists (100%) reported to be right-handed with a majority working (69.17%) from permanent cubicles and 30.85% operating from temporary street stalls. A consistent pattern of discomfort was observed in both hands with higher discomfort reported in the wrists, followed by index and middle fingers and thumb. The ring and little finger exhibited the least discomfort for both right and left hands among florists. These results emphasize the need for ergonomic interventions such as incorporating micro breaks and practicing hand exercises in between tasks to alleviate the hand discomfort experienced by florists at work.

**Keywords:** Florists, Hand discomfort, Work-related Musculo-Skeletal Discomfort (WMSD), Ergonomics and Unorganized sector.

### Introduction

Floral crafting is deeply embedded in India's cultural and traditional heritage. This labour-intensive profession that has existed for years primarily involves workers in the informal sector engaged in crafting garlands, jewellery, bouquets and decorative arrangements with real flowers.<sup>1</sup> The crafting process involves repetitive hand and arm movements to perform various tasks and sub-tasks like sorting, trimming, sewing, styling and assembling while making garlands, jewellery and bouquets of various styles and sizes.

Furthermore, florists use varied hand tools and objects to make these stylized crafts including needles, floral scissors, floral knives, wire cutters and staplers, among others. The use of such tools combined with the demands of the tasks often necessitate leaning forward for better visual control and focus for extended periods of work. Additionally, most informal sectors operate along the streets with inadequate infrastructures and demanding environments. These challenging environments, cramped workstations, use of poorly designed tools, repetitive movements, adoption of awkward postures and extended working hours expose florists to various ergonomic risk factors that contribute to development of musculoskeletal disorders, particularly in the hands and upper limbs. Hence, it is crucial to explore work-related musculoskeletal discomfort, particularly hand discomfort and associated risk factors experienced by florists in the informal sector to develop effective intervention strategies and promote their well-being.

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## Review of Literature

Musculoskeletal disorders are known to adversely affect workers' health, resulting in decreased productivity and increased absenteeism at work.<sup>2</sup> Classified as an occupational illness by ILO (International Labour Organization), musculoskeletal disorders are ranked as the second most common occupational disorder in Western countries, following dermatitis.<sup>3</sup> Work-related musculoskeletal (WMSDs) are considered multifactorial that result from a combination of risk factors including repetitive motion, poor posture and inadequate ergonomic practices, which vary in prevalence and impact workers across different professions.<sup>4,5</sup>

Hand-related musculoskeletal disorders (MSDs) have been on the rise globally and are primarily attributed to repetitive and low-amplitude use, sustained over extended periods.<sup>6</sup> Epidemiological research associates the onset and severity of work-related musculoskeletal disorders (WMSDs) in the hands and wrists with the performance of repetitive and forceful hand-intensive tasks. Furthermore, the impact of these disorders is said to be intensified when such tasks are performed in awkward or extreme wrist and forearm positions, as well as under conditions involving extreme temperatures, noise and vibration.<sup>2</sup>

Jansen et al.<sup>7</sup> assessed hand discomfort among thirty-seven female production assembly workers using the Cornell Hand Discomfort Questionnaire. The study revealed that discomfort was more pronounced in the right wrist in comparison to the left wrist (6.2%) and right thumb (3.6%) among the subjects whereas discomfort in the ring fingers and little fingers were quite minimal.

Similarly, from their study on musculoskeletal disorders of hand in healthcare worker studied the relationship between hand discomfort and demographics of 217 subjects.<sup>6</sup> The findings indicated higher discomfort in the right hand as compared to the left; the right wrist was found to be the most affected area, with a discomfort score of 1.79, followed by the right thumb joint with a discomfort score of 1.65.

While the prevalence and impact of work-related musculoskeletal discomfort across various occupations have been reported by numerous researchers in the past, limited data is available for work related hand discomfort particularly within the informal sector of florists who are exposed to varied occupational risks. Thus, this study was undertaken to explore the prevalence of work-related hand discomfort among florists in the informal sector of Mumbai and its suburbs.

**Aim:** To explore the prevalence of work-related hand discomfort among florists in the informal sector of Mumbai and its suburbs.

## Methodology

For the present study, purposive sampling technique was employed to select florists from Mumbai's unorganized sector. A group of 120 florists with a minimum of two years of work experience in floral crafting were recruited for the study. Data was gathered using a semi-structured interview schedule to obtain the socio-demographic and work-related information along with the Cornell Hand Discomfort Questionnaire [CHDQ, Cornell University, 1994] that was used to assess the frequency, intensity and interference (at work) of hand discomfort experienced by the florists. Data collected was analyzed using descriptive statistics.

## Results and Discussion

Table 1 indicates the demographic details of florists working in the informal sector of Mumbai and its suburbs. Majority of the florists (73.34%) were between the age of 18-38 years while 26.66% were above 38 years. While 45% of florists were illiterate, 30.83% had attained primary education and 23.33% of florist's secondary education. A significant section of florists was salaried (62.50%) while 37.50% were owners. About half of the florists (56.66%) earned a monthly income between 11-20k while 26.66% reported an income of 0-10k per month. Lesser number of florists reported a monthly income between 21-30k (7.50%) and 31-40k (9.17%).

**Table -1:** Demographic Details of Florists [N=120]













FLORISTS		No.	%
Age (yrs)	18-28 years	41	34.17
	28-38 years	47	39.17
	38-48 years	19	15.83
	Above 48 years	13	10.83
Education	Illiterate	55	45.83
	Primary education	37	30.83
	Secondary education	28	23.33
	Graduate	0	0.0
Employment status	Ownership	45	37.50
	Salaried	75	62.50
Monthly Income	0 -10K	31	26.66
	11-20k	69	56.66
	21- 30K	09	7.50
	31- 40K	11	9.17
	More than 50K	0	0.0

From table- 2, it is evident that equal number of florists specialized in garland making (33.33%), jewellery making (33.33%) and crafting bouquets (33.33%). Most florists reported to work for all days in a week (66%), followed by 20% and 14% working for 3-4 days and 5-6 days respectively. A significant majority worked for more than 9 hours while 25% reported to work for 5-8 hours daily. All florists (100%) reported to be right-handed. A majority of florists (69.17%) worked in permanent cubicles while a smaller group of 30.85% operated from temporary stalls. Additionally, most part of the work-day florists adopted the sitting posture while making garlands and jewellery while a few bouquet makers adopted the standing posture.

**Table- 2:** Work related Information of Florists [N=120]

FLORISTS		No.	%
Type of Floral Craft	Garland Making	40	33.33
	Jewellery Making	40	33.33
	Bouquet Making	40	33.33
Working Days	1-2 days	0	0
	3-4 days	24	20
	5-6 days	17	14
	All 7 days	79	66
Working Hours	0-4 hours	-	-
	5-8 hours	27	25
	9-12 hours	63	52.50
	More than 12 hours	30	22.50
Dominant Hand	Right handedness	120	100
	Left handedness	0	-
Work space	Permanent cubicles	83	69.17
	Temporary stalls	37	30.83

Table- 3: Total Discomfort Score [N=120]

Body (hand) parts referred in the questionnaire	Frequency of discomfort	Intensity of discomfort	Interference	Total discomfort score	%	
<b>RIGHT HAND</b>						
Area-A		679	167	281	31863433	9.72
Area-B		55	34	125	233750	0.07
Area-C		643	167	288	30925728	9.44
Area-D		603.5	177	287	30657197	9.36
Area-E		617	171	281	29647467	9.05
Area-F		766	201	298	45881868	14.00
<b>LEFT HAND</b>						
Area-A		679	167	281	31863433	9.72
Area-B		36	21	126	95256	0.03
Area-C		623	174	292	31653384	9.66
Area-D		564	169	275	26211900	8.00
Area-E		592	157	275	25559600	7.80
Area-F		757.5	196	290	43056300	13.14

The total discomfort score from table 3 reveals that highest total discomfort score was observed in the right wrist (14.00%), followed by index and middle finger (9.72%) and thumb (9.44%). The discomfort scores were similarly high for the left hand. Wrist discomfort (left) had the greatest score (13.14%), followed by index and middle fingers (9.72%), thumb C (9.66%). The little and ring fingers for both right (0.07%) and left hands (0.03%) exhibited the lowest discomfort score.

Overall, the data reflects a consistent pattern of discomfort across both hands among florists with the discomfort score in the wrists being significantly higher than in other parts of the hand. Earlier investigations identify repetitive tasks and use of force as potential risk factors that contribute to the development of wrist and hand disorders. The association between repetitive tasks and prevalence of upper limb musculoskeletal disorders was investigated by Latko et al. (1999)<sup>8</sup> among 352 workers from 3 different companies. The study indicated a significant correlation between the reported discomfort in the wrists, fingers, hand and repetitive tasks. While repetitive tasks are considered to be potential risk factors, study by Thomsen et al., (2007)<sup>9</sup> highlights that the application of hand force is a more critical risk factor associated with the prevalence and incidence of hand and wrist pain.

Thus, the findings indicate a significant prevalence of wrist and hand discomfort among florists in Mumbai's unorganized sector and emphasize the need for ergonomic interventions that are aimed at reducing them. Use of ergonomic tools, optimized workstations, simple hand exercises and regular micro breaks will help reduce muscle tension and mitigate the discomfort and potential hand injuries resulting from repetitive movements and use of force. The study recommends, adopting these ergonomic practices for enhancing the overall well-being of florists at work.

### Conclusion

The study indicates significant prevalence of hand discomfort among florists engaged in garland, jewellery and bouquet making in the unorganized sector of Mumbai city and its suburbs. A consistent pattern of discomfort was observed among florists in both hands with higher discomfort in the wrists, index and middle fingers and thumb.

To reduce and alleviate hand discomfort, it is advised that florists practice warm and cool exercises of the hand and take frequent micro-breaks between extended periods of repetitive handwork. Additionally, use of ergonomic tools and optimized workstations will help mitigate the discomfort and potential hand injuries resulting from repetitive movements and use of force. The study further highlights the need for additional research to explore the occupational risks associated with florists along with developing and assessing the effectiveness of ergonomic interventions.

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