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Assessment of musculoskeletal problems of Hairsalon workers

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Abstract
Hair dressing job has been related to various harmful health effects on hair salon workers such as working in prolonged awkward postures with repetitive movements, vibration effects and contact stress. Working in standing posture for long duration results in increased postural discomfort and decrease in work performance. Hairdressers are also commonly at risk of work-related upper limb problems due to supporting weight or tools while holding arms away from the body cause severe pain in shoulder region, lower back, neck etc. The present study was conducted to assess the work postures and explore the muscular stresses experienced by the female hair dressers. The study was conducted on 20 randomly selected female hair dressers with average to good health status. A self structured interview schedule was developed related to musculoskeletal problems of female hair dressers. To evaluate the body posture and risk analysis WERA method was used and Corlett and Bishop scale to analyze the discomfort experienced by the female hair dressers. Results revealed that the maximum respondents had experienced postural discomfort in shoulder region followed by wrist, back and neck. The WERA analysis revealed that the risk level was medium, there is need for investigation and change is required to prevent musculoskeletal problems. Hairdressers need regular exercise, healthy diet and balanced rest break with respect to the load of working hours to reduce the physical exertion in different parts of the body.

Keywords: Musculoskeletal problems, repetitive movement, postural discomfort, work posture

Introduction
Hairdressing is a profession which is blooming in modern time not only in money making but also as a desired line of work for the youth. Hair dressing involves cutting, styling, coloring, straightening, rebonding and dressing of hair in order to glow up the clients' personality. Although this profession reflect back poor health status of the hair dressers as they have to work in for hours in uncomfortable working posture like repetitive movement of hands, wrist and neck causing severe muscular pain in the body parts. have antifungal activity. Therefore, keeping in view the importance of the crop, seriousness of the disease, non-availability of suitable management practices and gaps in our knowledge about this disease.
Musculoskeletal Disorders (MSDs) is a term given to a group of conditions representing a wide range of illnesses that involve the nerves, tendons, muscles and supporting structures such as intervertebral discs (HSE 2009) [6]. Musculoskeletal discomfort is caused due to prolong hours of repetitive movements, awkward working postures, standing for long hours, uncomfortable temperatures and the use of faulty tools and equipment. The poor posture and body motion resulting in discomfort in the neck, back, shoulder, wrist and other parts of the musculoskeletal system are challenge for female hairdresser which also results in poor productivity of job performance, but also increased time off work and early retirement from this profession (Fang *et al.* 2007) [5]. Hair dressers posture need to be studied as this business is touching the heights. The salon workers also work for extra time giving their extra workforce to satisfy the client's desired hair dressing. It directly reflects the stress faced by the salon workers which results in poor job performance. A pilot study was undertaken on 20 female hairdressers to assess the musculoskeletal problems experienced by them. Therefore, the present study was conducted with the following objectives:
1. To assess the work postures adopted by female hair dressers.
2. To explore the musculoskeletal stresses faced by female hair dressers.

Materials and methods
Selection of location: The study was conducted in Ludhiana city as per the convenience of the researcher.

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Selection of sample: The sample size comprise of twenty female respondents with average to good health status were selected. Ten hair salons were randomly selected and from each salon two respondents were selected. These workers were involved in almost all the activities such as hair cutting, styling, hair smoothening, rebonding, hair coloring, hair spa etc.

Procedure
An interview schedule was prepared to collect data regarding personal profile, job profile, environmental parameters and task performed by the respondents at hair salon.

Assessment of work posture
Following scale were used to assess the work postures of the respondents. The discomfort faced by the respondents during the task was analyzed with work posture scale.

Work posture scales used are
i) **Workplace ergonomic risk assessment (WERA) Tool:** The WERA tool was developed to provide a method of screening the working task quickly for exposure to the physical risk factor associated with work-related musculoskeletal disorder (WMSDs). The WERA assessment consists six physical risk factors including posture, repetition, forceful, vibration, contact stress and task duration and its involve the five main body regions (shoulder, wrist, back, neck and leg). It has a scoring system and action levels which provide a guide to the level of risk and need for action to conduct more detailed assessment.

ii) **Corlett and Bishop (1976) [4] Scale for Postural Discomfort:** This subjective scale was used to measure the localized discomfort, musculoskeletal problems and intensity of pain in different body parts resulting from postural discomfort. In this technique, the body was divided into a number of regions. Intensity of pain perceived by respondents in each reported body part was determined by 5-point continuum. The maximum intensity level of pain was given a rating of 5 for very severe, 4 for severe, 3 for moderate, 2 for mild and 1 for very mild. The body discomfort scores of all the respondents were added and averaged to get total mean scores.

iii) **Grip Strength:** Grip strength has become a popular indicator of physical functioning in surveys. Measurements were performed with both hands using a hand-hold calibrated dynamometer. The dynamometers were calibrated at the start of the study. Grip strength was measured in a face-to-face assessment with the participant sitting comfortably. The examiner ensured that the arm to be tested was held by their side and their elbow was at a 90° angle. The participant was asked to squeeze the hand as hard as possible for few seconds. The measurement was repeated after a recovery period of 5 min in order to test the reliability. Hand grip strength was expressed in kilograms (kg).

Calculation of grip strength reduction

$$\frac{\text{Before activity} - \text{After activity}}{\text{Before activity}} \times 100\%$$

Analysis of data
The data collected on musculoskeletal problems were analyzed by using averages, percentages and mean scores and the results are presented in form of tables.

Results and discussion
I. Personal and job details of the respondents.
Table 1 reveals that the average age of female hair dresser was found to be 30 years. In terms of education level, 65 per cent of the respondents were matric passed followed by15 per cent who completed their higher secondary and only 20 per cent of the respondents were graduate. The average income/ month was found to be Rs.22,725. Nearly half of the respondents i.e. 45 per cent had income ranging between Rs.5000-15000/- working as part time hair dresser.

Table 1: Personal profile of the respondents

n=20

Personal profile	Frequency	Percentage
Age		
20-30	5	25.00
30-40	10	50.00
40-50	5	25.00
Average	30	
SD	±6.88	
Education		
Matric	13	65.00
Higher secondary	3	15.00
Graduate	4	20.00
Income/ month (Rs.)		
5000-15000	9	45.00
15000-25000	2	10.00
25000-35000	3	15.00
Above 35000	6	30.00
Average	22,725	
SD	±17631.81	

Table 2 depicts that majority (70%) of the respondents take break for at least 0.5- 1 hours in salon. About 30 per cent take break for 1-2 hours a day in salon. Generally, the break time depends on the number of clients per day and the busiest day of the hours which people more prefer is during evening time. On an average the working hours per day per female worker was 8.45 hours.

Table 2: Job profile of the respondents

n=20

Job profile	Frequency	Percentage
Working hours		
6-8	12	60.00
8-10	8	40
Average	8.45	
SD	±1.39	
Break time(hours)		
0.5-1	14	70.00
1-2	6	30.00
Average	1.12	
SD	±0.62	

Table 3 indicates the tasks performed by female hairdressers in selected salons. The result reveals that all the respondents were involved in hair washing task followed by hair cutting (75%), hair blow-drying (70%), hair straightening (55%), hair smoothening (55%) and hair coloring (50%). As there were few respondents under training period due to which they were involved in basic hair salon task.

Table 3: Task performed by respondents in hair salon

n=20

S. No.	Task	No. of respondents'	Percentage
1.	Hair washing	20	100.00
2.	Hair cutting	15	75.00
3.	Hair straightening	11	55.00
4.	Hair coloring	10	50.00
5.	Hair blow-drying	14	70.00
6.	Hair smoothening	11	55.00

*Multiple response

Table 4 the environmental conditions of salon should be favorable for both the workers and clients. If the work place has a comfortable setup the results will be fruitful since the workers have to perform tedious task inside the room with continuous commotion of conversation, loud music and equipment sound. In table 4 the results revealed that the existing lighting conditions of the hair dresser working area was 850 lux which was under the normal range of salon lighting followed by humidity 56 per cent and noise level 86 db. The above two existing environmental parameters for workplace are in better condition for workers and clients except the noise parameter which was above the recommended range 86 db. The loud commotion for constant period of time leads to psychological disturbance and poor job performance.

Table 4: Environmental parameters of workplace

Parameters	Existing conditions (Mean & SD)	Recommended range*
Lighting (lux)	850±139.78	500-1000
Humidity (%)	56 ± 4.06	50-70%
Noise level (db)	86± 12.88	80

*Source: Green Salon research report

II. Analysis of work postures of selected respondents.
Table5 unveils the scores of analysis of different postures of the respondents working in various hair dressing task such as smoothening, hair blow-drying, hair straightening, hair coloring etc. by using WERA sheet. The findings show that the physical risk factor during work was maximum in shoulder (score 5), wrist (score 5) and back (score 4) region of the body part. The other physical risk factor such as vibration of tool used while hair dressing (blow drying) reported to be maximum score 5. Overall, the total score of the physical risk was observed to be 31 which reveal medium risk factor among the female hair dressers.

Table 5: Analysis of different postures of female hair dresser by using WERA sheet

n=20

WERA		
S. No.	Physical risk factor	Score
1.	Shoulder	5
2.	Wrist	5
3.	Back	4
4.	Neck	3
5.	Leg	2
6.	Force in load lifting	2
7.	Vibration of tool used	5
8.	Contact stress in using of tool handle	2
9.	Task duration	3
	Total Score	31

Table6 reveals that majority (80%) of the respondents found to be at medium risk level while working in hair salon. It was observed that the task needs further investigation and required change in work posture. Only 20 per cent of the respondents were reported acceptable task while working in hair salon. If there is no changes brought about in the work posture, than it may lead to the risk of musculoskeletal problems among workers. Joshi (2006) [7] also observed that incidences of mild to moderate pain was observed by users in different parts of body due to faulty postures adopted for long hours of work.

Table 6: Analysis of risk and action level of female hair dresser by using WERA sheet

n=20

WERA Action level			
Risk level	Final score	Action	Frequency (%)
Low	18-27	Task is acceptable	4 (20.00)
Medium	28-44	Task is need to further investigate and required change	16 (80.00)
High	45-54	Task is not acceptable, immediate change required	0 (00.00)

III. Musculoskeletal problems faced by the respondents.
Table7 unfold the postural discomfort experienced by respondents based on 5 point scale of Corlett and Bishop Scale (1976) [4] results reveal that female hair dressers faced maximum postural discomfort in shoulder (mean score 4.55) ranked I, wrist (mean score 4.15) ranked II, lower back (mean score 4) ranked III and neck (mean score 3.75) ranked IV. While hair dressing task performed by the respondents less discomfort was felt in the elbow region. These findings are substantiated with the study conducted by Park et al. (2000) [11] on work related musculoskeletal disorders of hair dresser. The results reveal that pain among hairdressers was distributed as 61 per cent complained of shoulder pain, 59.9 per cent of neck pain, 53 per cent of lower back pain, and 42 per cent of hand and wrist pain. Similar study by Chuang (2005) [3], found that majority (94.4%) of hairdressers voted that their shoulders were the most uncomfortable body region, followed by the lower back and neck. In short, it is obvious that most research into work related musculoskeletal disorders indicated that hairdressers suffer from discomfort in their upper limbs, neck, shoulders, lower back and wrists.

Table 7: Postural discomfort experienced by respondents by using Corlett and Bishop Scale 1976 [4]

n=20

Body parts	Mean Score	Rank
Shoulder	4.55	I
Wrist	4.15	II
Lower back	4	III
Neck	3.75	IV
Upper back	3.55	V
Upper arm	3.25	VI
Lower arm	3.05	VII
Elbow	1.9	VIII

*Multiple response

Figures indicates rank on the basis of 5-point scale from very heavy exertion (5) to very light exertion (1).

Table8 indicates about the average grip strength of the respondents before and after activity respectively. In right and left hand the grip strength of before activity was 20.23 kg and 18.25 kg respectively and after activity the result showed 17.42 kg in right and 16.21 kg in left hand respectively. The finding shows that the total grip strength reduction was found to be 13.89 per cent in right hand and 11.17 per cent in left hand. Since both the hands are used in performing hair dressing tasks and holding equipment so, the workers felt fatigue in their hands. The right hand is known to be dominated hand and the left one is non-dominated. This showed that the right hand of the workers experienced greater grip strength reduction than left hand. Similar study addressed by Bagi *et al.* (2011) [2] that the greater grip strength was experienced in the dominant hand both in cases of right hander and left hander.

Table 8: Grip strength of the respondents

		n=20
Grip strength	Right hand (Kg)	Left hand (Kg)
Before activity (Average)	20.23	18.25
After activity (Average)	17.42	16.21
Total grip strength reduction (%)	13.89	11.17

Conclusion

It can be concluded from the above results that hairdressers were observed to be at medium level of health risk in their workplace. This was due to awkward posture and mechanical loads on the joints which require greater muscular efforts for long working hours. The excessive use of vibration tools and holding arms away from body increases the stress to the wrist, back and shoulder areas. Thus, continuous work of similar nature with uncertain rest breaks will result in fatigue and body injury. Hairdressers need to change their work techniques and practices for healthy functioning of the body. As the hair salon workers work for extra time giving their extra workforce to satisfy the client's desired hair dressing. Hairdressers must adopt the practice of stretching and exercise to avoid the discomfort faced by them during work period.

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