



Musculoskeletal Health and Physical Fitness Assessment among Hairdressers in Belagavi City, India: A Cross-Sectional Study

Peeyoosha Gurudut^{1*}, Keegan Menezes² and Manveen Kaur Sembhi³

¹Department of Orthopedic Physiotherapy, KAHER Institute of Physiotherapy, Belagavi - 590010, Karnataka, India; peeo123@yahoo.com

^{2,3}KAHER Institute of Physiotherapy, Belagavi - 590010, Karnataka, India

Abstract

Hairdressers are a group of workers whose working ability and health condition may be affected by specific work related activities. They are also at risk of developing Work Related Musculoskeletal Disorders (WRMSDs) and lack of physical fitness due to working condition and work related exposures. Prevalence of WRMSDs and level of physical fitness in hairdressers is lacking in Indian population. Hence, present study aimed to find prevalence of musculoskeletal problems and levels of physical fitness among hairdressers. It was a cross-sectional observational study. A total of 161 hairdressers were recruited by cluster sampling with samples representing south and north regions of Belagavi city, India. The participants were assessed for WRMSDs using Nordic questionnaire while physical fitness levels were assessed for strength and flexibility of upper and lower limbs along with cardio-vascular endurance. Out of 161 hairdressers, prevalence of WRMSDs was among 101 (62.11%). Lower back was the most affected body region with 56.5% followed by neck 11.8%. 101 hairdressers had first experience of musculoskeletal discomfort after becoming a hairdresser. When assessed for physical fitness, it was noted that the strength of upper limb was affected in 129 (80%) hairdressers while flexibility of lower limb was affected in 130 (80.7%) hairdressers. There is a high prevalence of WRMSDs in hairdressers of Belagavi city, India with lower back and neck being the most affected body regions. In terms of physical fitness, strength of upper limb and flexibility of lower limb were the most affected.

Keywords: Occupational Health, Physical Fitness, Prevalence, Salon Workers, Work Related Musculoskeletal Disorders

1. Introduction

The Work Related Musculoskeletal Disorders (WRMSDs) are health problems that involve injuries or disorders of muscles, tendons, nerves, joints, cartilage and spinal disc which are suspected to have been associated with exposures to risk factors at a workplace¹. WRMSDs are groups of syndromes characterized by symptoms of soft tissue pain, paresthesia, stiffness, swelling, weakness, discomfort and loss of function that can be caused or aggravated by work related exposures². A high prevalence of WRMSDs has been recorded (75.6%) among workers who are exposed to manual work, working in restricted postures, static work and vibrations¹. Musculoskeletal disorders place a substantial burden on millions of people affecting all age groups. It can have major impact on worker function, performance and productivity².

Hairdressers are a group of workers whose working ability and health condition may be affected by specific work related activities³. Typical postural issues in hairdressers include excessive shoulder flexion and shoulder abduction which is caused by working with elbow at or greater than shoulder height, trunk flexion (because chair may not be at proper height), forward neck flexion, awkward wrist postures using scissors or hand shears^{1,4}. The job of hairdresser is characterized by standing for prolonged periods of time in awkward body postures, handling a variety of chemicals, and undergoing repetitive hand movements⁵. In hairdressing, women and men are also exposed to physical and mental stress, and to musculoskeletal injuries arising from repetitive trauma disorders, as they have to stand for long periods⁶.

A study conducted on the WRMSDs among hairdressers has majorly focused on particular or specific body area without

*Author for correspondence

any due considerations to other parts of the body that may also suffer musculoskeletal pain¹. A survey on Brazilian hairdressers done to verify the prevalence of WRMSDs in hairdressers through symptoms stated that the prevalence of WRMSDs was 71%.³ There was only one study done in Uttarakhand, India where only male hairdressers were assessed for neck and upper extremity disorders along with hand grip strength⁴. Hence, there is a lacuna in literature and need arises to study the prevalence of work related musculoskeletal disorders in both male and female hairdressers in India so as to find which body region is majorly affected.

Altered physical fitness may be an expected occurrence in hairdressers since the work of hairdressers is physically demanding causing strain due to the long working hours or days³. Physical fitness is defined as “the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies”⁷.

Hence, a research question was raised that hairdressers may be at risk of reduced physical fitness due to long hours of standing and sitting postures involved during the occupation. A study was done in Thailand on office workers where physical fitness of participants were assessed in five domains including range of motion, neck endurance, strengthening of neck flexor muscle, grip strength and cardio-respiratory fitness. The authors concluded that the participants had low physical fitness level⁷.

According to onsite observations, most of the hairdressers used their non-dominant hands to comb, hold hair with their fingers and wave/curl hair while cutting or blow-drying, perfuming, washing hair etc⁴. These working conditions may also have impact on their physical fitness levels with reduced endurance, strength and flexibility⁷.

Hence, physical fitness needs to be evaluated so as to understand the associated health risks involved in them. Hence, in the present study, the authors tried to find the prevalence of physical fitness by assessing the hair dressers in terms of strength, flexibility and endurance.

2. Materials and Methods

2.1. Ethical Consideration

Ethical clearance was obtained (KLE/412/2019) from the Institution Ethical Committee prior to the commencement of the study. The purpose of the study was explained and written informed consent was obtained from all study participants.

2.2. Study Design and Setting

It was a cross-sectional observational study. The data was collected for 6 months from August 2019 till Feb 2020. The investigators/data collectors collected the data from the

salons. Target population was included in the study through cluster sampling such that the hairdressers represented the entire Belagavi city. The city was divided into north and south clusters. On Google maps, 110 salons were registered. Out of 110 salons, 64 salons were from south region and 46 were from north region of Belagavi city, India. Of 64 salons from south, 32 salons were included for data collection while 23 salons were chosen out of 46 salons in the north region. This selection was done using simple random sampling using lottery method. From each of the selected salons, only 3 hairdressers were selected for study, with 93 hairdressers from South and 68 from North regions. This selection also was done using simple random sampling using chit method.

2.3. Participants

Participants were included if they met the following criteria: 1. Male and female hairdressers of Belagavi city with minimum 2 years of experience 2. With age group between 18-50 years 3. Those willing to participate in the study.

Participants were excluded if 1. They had any musculoskeletal deformity or neurological disorders 2. History of any medical or surgical condition 3. Those participating in regular physical exercise in past 6 months 4. Pregnancy 5. History of any medical condition/systemic disorder which doesn't allow the subject to participate in the study 6. History of degenerative joint disease/condition.

2.4. Study or Assessment Procedure

The subjects were explained about the study by the investigators in their vernacular language. They were assessed using the Nordic questionnaire and the physical fitness tests then the results were determined. Nordic questionnaire was a scale which helped to determine the most affected body part due to work related musculoskeletal disorders. Demographic data was obtained from all the subjects including name, age, gender, height, weight, hand dominance, number of working hours and years of experience, type of work.

2.5. Outcome Measures

2.5.1. Nordic Questionnaire

Nordic questionnaire was a scale which helps to determine the most affected body part due to work related musculoskeletal disorders. It was a general questionnaire of 40 forced-choice items identifying areas of the body causing musculoskeletal problems. It included most affected body parts such as neck, shoulders, elbows, wrists/hands, lower back, hips/thighs, knees, ankles/feet. Reliability of the Nordic Musculoskeletal Questionnaire ranged from 0-23%. Validity was at range of 0-20%. Sensitivity ranged between 66 and 92% and specificity between 71-88%⁸.

2.5.2. Physical Fitness

Cardio-vascular endurance was assessed using queen's college step test (Figure 1), strength of upper limb and lower limb was checked using push-up test (Figure 2) and vertical jump test (Figure 3) and flexibility of upper limb and lower limb was assessed using the static flexibility test for upper limb (Figure 4) and modified sit and reach test (Figure 5) respectively. It was scored as excellent, average and poor and its normative values were based on the age and gender of the participants. All the test procedure was done following the reference book⁹.

2.6. Statistical Analysis

The statistical analysis for the present study was done using Statistical Package of Social Sciences (SPSS) version 23 so as to verify the results obtained. For this purpose data was entered into an excel spread sheet, tabulated and subjected to statistical analysis. Various statistical measures such as mean, frequency, standard deviation were used. The sample size calculated was 161. Formula used was $N = Z^2pq/d^2$, where N = sample size, d = difference, p = prevalence of work related musculoskeletal disorders (WRMSD), q = alternative prevalence, z = 1.96 at 5%α-error 95% Confidence.



Figure 1. Queens College step test for cardio-vascular endurance.

3. Results

Out of 161 hairdressers 108 (67.1%) were male and 53 (32.9%) were female, 159 (98.8%) hairdressers had right hand dominance while 2 (1.2%) had left hand dominance. The mean \pm SD for age was 29.99 ± 6.49 years (Min – Max: 18 -51), height 1.61meters, weight 64.02 and BMI (24.76). (Table 1)

154 (95.7%) hairdressers worked for 6 days/week, 6 (3.7%) of them worked for 7 days/week and only 1 (0.6%) worked for 5 days/week. The hairdressers were also asked the working hours per day where 118 (73.3%) hairdressers worked for 10-12 hours, 41 (25.5%) worked for 13-14 hours while only 2 (1.2%) hairdressers worked for 6-8 hours per day. When asked about their years of work experience, 47 (29.1%) hairdressers had 3-5 years of work experience, 83 (51.5%) had 6-12 years of work experience and 31 (19.2%) hairdressers had 13-35 years of work experience (Table 2).

According to the results none (0%) of the hairdressers had first experience of discomfort before becoming a hairdresser. Out of 161, 51 (31.7%) hairdressers had discomfort in first 5 years of becoming a hairdresser, while 43(26.7%) of hairdressers had discomfort from 5-15 years, and 7(4.3%) hairdressers had discomfort after more than 15 years of becoming a hairdresser.

In terms of awareness about ergonomics in hairdressers, among 101(62.11%) who complained of some WRMSDs, only 16 (15.8%) hairdressers were aware of ergonomics while 85 were not aware about ergonomics involved in workplace. Among the



Figure 2. Push-up test for strength of upper limb.

Table 1. Descriptive statistics

| Particulars | Mean | Std. Deviation | Minimum | Maximum |
|-----------------|-------|----------------|---------|---------|
| AGE(years) | 29.99 | 6.49 | 18.00 | 51.00 |
| HEIGHT (meters) | 1.61 | 0.07 | 1.45 | 1.83 |
| WEIGHT(kgs) | 64.02 | 7.19 | 48.00 | 88.00 |
| Body Mass Index | 24.76 | 2.90 | 17.50 | 33.29 |



Figure 3. Vertical jump test for strength of lower limb.



Figure 5. Modified sit and reach test for flexibility of lower limb.



Figure 4. Static flexibility of shoulder for flexibility of upper limb.

Table 2. Days, hours and work experience of hairdressers

| WORKING DAYS PER WEEK | | |
|-----------------------|-----------|---------|
| Days | Frequency | Percent |
| 5 | 1 | .6 |
| 6 | 154 | 95.7 |
| 7 | 6 | 3.7 |
| Total | 161 | 100.0 |
| WORKING HOURS PER DAY | | |
| Hours | Frequency | Percent |
| 6-8 | 2 | 1.2 |
| 10-12 | 118 | 73.3 |
| 13-14 | 41 | 25.5 |
| Total | 161 | 100.0 |
| WORK EXPERIENCE | | |
| Years | Frequency | Percent |
| 3-5 | 47 | 29.1 |
| 6-12 | 83 | 51.5 |
| 13-35 | 31 | 19.2 |
| Total | 161 | 100.0 |

Table 3. Hairdressers and awareness of ergonomics

| | Aware of Ergonomics | | Not aware of Ergonomics | | Total | |
|---------|---------------------|------|-------------------------|------|-----------|------|
| | Frequency | % | Frequency | % | Frequency | % |
| Pain | 16 | 15.8 | 85 | 84.1 | 101 | 62.7 |
| No pain | 30 | 50 | 30 | 50 | 60 | 37.2 |

Table 4. Distribution of responses of participants of WRMSDs using nordic questionnaire

| NECK | | | | | | | | |
|----------------------|--|------|------------------------------|------|----------------------------|------|---------------------------|------|
| RESPONSE | Trouble before 6 months but within 12 months | | Trouble during last 6 months | | Trouble during last 7 days | | Prevented from doing work | |
| | Frequency | % | Frequency | % | Frequency | % | Frequency | % |
| Yes | 19 | 11.8 | 19 | 11.8 | 11 | 6.8 | 11 | 6.8 |
| No | 142 | 88.2 | 142 | 88.2 | 150 | 93.2 | 150 | 93.2 |
| Total | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |
| LOWER BACK | | | | | | | | |
| Yes | 91 | 56.5 | 89 | 55.3 | 77 | 47.8 | 68 | 42.2 |
| No | 70 | 43.5 | 72 | 44.7 | 84 | 52.2 | 93 | 57.8 |
| Total | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |
| HIPS/THIGHS/BUTTOCKS | | | | | | | | |
| Yes | 3 | 1.9 | 3 | 1.9 | 0 | 0 | 0 | 0 |
| No | 158 | 98.1 | 158 | 98.1 | 161 | 100 | 161 | 100 |
| Total | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |
| KNEES | | | | | | | | |
| Yes | 1 | 0.6 | 1 | 0.6 | 0 | 0 | 0 | 0 |
| No | 160w | 99.4 | 160 | 99.4 | 161 | 100 | 161 | 100 |
| Total | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |
| ELBOW | | | | | | | | |
| Yes | 2 | 1.2 | 2 | 1.2 | 1 | 0.6 | 1 | 0.6 |
| No | 159 | 98.8 | 159 | 98.8 | 160 | 99.4 | 160 | 99.4 |
| Total | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |
| SHOULDERS | | | | | | | | |
| Yes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| No | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |
| Total | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |
| WRISTS/HANDS | | | | | | | | |
| Yes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| No | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |
| Total | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |
| UPPER BACK | | | | | | | | |
| Yes | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| No | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |
| Total | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |
| FEET/ANKLES | | | | | | | | |
| Yes | 1 | 0.6 | 1 | 0.6 | 0 | 0 | 0 | 0 |
| No | 160 | 99.4 | 160 | 99.4 | 161 | 100 | 161 | 100 |
| Total | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |

Table 5. Relation of years of work experience with occurrence of WRMSDs

| Work experience | Total no. of participants | | Prevented from carrying out normal activities | | Prevented from carrying out normal activities (%) |
|-----------------|---------------------------|------|---|----|---|
| | Frequency | % | Yes | no | % |
| 3-9 years | 101 | 62.7 | 52 | 49 | 51.4 |
| 10-20 years | 54 | 33.5 | 23 | 31 | 57.4 |
| >20 years | 6 | 100 | 2 | 4 | 66.7 |

Table 6. Association between years of work experience and prevention from carrying out normal activities

| Years of work experience | Total no of participants | | Hairdressers with WRMSDs | | Hairdressers without WRMSDs | |
|--------------------------|--------------------------|------------|--------------------------|------------|-----------------------------|------------|
| | Frequency | Percentage | Frequency | Percentage | Frequency | Percentage |
| 3-9 years | 101 | 62.7 | 57 | 56.4 | 44 | 43.56 |
| 10-20 years | 54 | 33.5 | 47 | 87.0 | 7 | 12.96 |
| >20 years | 6 | 3.72 | 6 | 100 | 0 | 0 |

60 (37.2%) hairdressers who did not complain of any pain, 30 (50%) hairdressers were aware about ergonomics (Table 3).

The overall prevalence of work related musculoskeletal disorder among selected 161 hairdressers in Belagavi city is 101 (62.11%). The occurrence of pain during last 6 months to one year showed to have high prevalence of discomfort in the lower back region [91(56.5%)] followed by neck [19(11.8%)]. The least affected were hips/thighs/buttocks [3(1.9%)], elbow [2(1.2%)], knees [1(0.6%)], ankle/feet [1(0.6%)]. Similar trend was noted during last 6 months with the most commonly affected body regions being lower back 89(55.3%), neck 19(11.8%). However, compared to the above mentioned data, during last 7 days although the occurrence of WRMSDs reduced. Further, during last 12 months, 68 (42.2%) hairdressers have been prevented from carrying out normal activities/jobs due to lower back pain and 11 hairdressers (6.8%) have been prevented from carrying out normal activities/jobs due to neck pain (Table 4).

According to the data, when the years of work experience was associated with occurrence of WRMSDs, out of 101 hairdressers, 57 hairdressers complained of WRMSDs with 3-9 years of experience. Among 10-20 years of work experience, 47 hairdressers complained of WRMSDs, and 6 hairdressers had WRMSDs in the category of more than 20 years of work experience (Table 5).

During last 12 months, hairdressers with 3-9 years of experience 52 (51.4%) hairdressers were prevented from carrying out normal activities, 23 (57.4) hairdressers with 10-20 years of experience and 2 (66.7%) hairdressers with greater than 20 years of experience were prevented from carrying out normal activities (Table 6).

4. Physical Fitness

In terms of Cardiovascular Endurance (CV), in the age group of 18-25 years, 20 hairdressers (12.4%) had average CV endurance and 2 (1.2%) had poor; in 26-35 years age group, 88 (54.6%) had average CV endurance and 17 (10.5%) had poor while in 36-45 years age group, 21 (13.0%) had average CV endurance and 7 (4.34%) had poor. The 46-55 years age group had 5 (3.10%) average CV endurance and 1 (0.62%) had poor. Pertaining to the strength of upper limb, in the age of 17-19 years, 2 (1.2%) had average strength while hairdressers in 20-29 years of age, 91 (56.5%) were average and 6 (3.72%) poor. In 30-39 years, 42 (26.08%) had average and 2 (1.24%) had poor while in age of 40-49 years, 16 (9.93%) had average and (50-59 years) had 1 (0.62%) average and 1 (0.62%) had poor. Hairdressers when assessed for strength of lower limb 97 (60.2%) fell under average category and 64 (39.7%) fell under poor category. Flexibility of upper limb when checked 151 were in average category and 10 fell under poor category. Whereas flexibility of lower limb all 161 hairdressers fell into the average category.

The overall fitness of all 161 hairdressers were assessed which inferred that 126 (78.3%) of the hairdressers were physically fit in terms of CV endurance; 32 (20%) in terms of strength (upper limb), 139 (86.3%) strength (lower limb); 148 (91.9) in terms of flexibility (upper limb), 31(80.7%) flexibility (lower limb) (Table 7).

According to the data, when the years of work experience was associated with physical fitness, trend shows that irrespective of years of experience physical fitness is affected in strength of upper limb (80%) and flexibility of lower limb (80.7%) (Table 8).

Table 7. Overall physical fitness analysis

| Particular | Endurance | | Strength UL | | Strength LL | | Flexibility UL | | Flexibility LL | |
|--------------------|-----------|------|-------------|-----|-------------|-------|----------------|------|----------------|------|
| | n | % | N | % | n | % | n | % | n | % |
| Physically fit | 126 | 78.3 | 32 | 20 | 139 | 86.33 | 148 | 91.9 | 31 | 19.3 |
| Physically not fit | 35 | 21.7 | 129 | 80 | 22 | 13.67 | 13 | 8.1 | 130 | 80.7 |
| Total | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 | 161 | 100 |

Table 8. Work experience and physical fitness

| Years of experience (no. of participants) | Endurance | | Strength UL | | Strength LL | | Flexibility UL | | Flexibility LL | |
|---|-----------|------|-------------|------|-------------|------|----------------|------|----------------|------|
| | Avg. | Poor | Avg. | Poor | Avg. | Poor | Avg. | Poor | Avg. | Poor |
| 3-9 years (101) | 93 | 8 | 87 | 14 | 100 | 1 | 98 | 3 | 30 | 71 |
| 10-20 years (54) | 41 | 13 | 17 | 37 | 45 | 9 | 43 | 11 | 14 | 40 |
| > 20 years (6) | 2 | 4 | 3 | 3 | 3 | 3 | 6 | 0 | 4 | 2 |

5. Discussion

Hairdressers are group of workers whose ability and health condition may be affected by specific work related activities³. A cross-sectional study conducted in Mekelle, Tigray, Ethiopia on hairdressers concluded that work-related back pain is a major health problem among hairdressers. Compared to non-hairdressers, the hairdressers frequently reported major musculoskeletal pain¹⁰.

The present study attempted to find the prevalence of WRMSDs in hairdressers of a city in the state of Karnataka in south India. The overall prevalence of WRMSDs was found to be high (62.11%). Similar findings were noted with higher prevalence of WRMSDs in previous studies conducted with overall prevalence of 75.6% in Nigeria¹, Brazil (71%)³ and Durban(60%)¹¹.

In the present study it was also noted that lower back was the most affected body region followed by neck with knees and feet the least affected body regions while shoulder had no affection at all. Higher prevalence of low back pain was also noted in many previous studies done in hairdressers^{1,3,11}. Also in a study it was noted that musculoskeletal pain was more in shoulder followed by wrist and hand and moderate amount of pain in upper, lower back and feet¹⁰. However, contradictory to the present study where shoulder was not affected, previous studies have reported shoulder to be having either highest prevalence or it followed the lower back pain³. Most of the previous studies were reported to have lower back, shoulder, neck region to be most commonly affected in hairdressers¹. This geographical difference in shoulder not being affected in the present study against the other studies where shoulder is most affected may be explained through body stature

differences, in Asia and African or European population. Body stature may include height, weight etc which should be suitable to the work station or place¹².

The most common factors that are responsible for musculoskeletal problems may include age of hair dressers, their years of working experience, and the long hours they spent working in a standing position, repetitive work done, biomechanical (uncomfortable posture at work), psychological factors (lack of acknowledgement of work)1–3. In the present study too almost all the hairdressers included in the study had long hours of working, where they had to stand in the same posture for long hours which ranged from 10-13 hours with 51.7% hairdressers having more than 5 years of working experience. This also indicates that as the years the years of experience increases the occurrence of WRMSDs increases.

Knowledge and awareness about ergonomics is very crucial to all the occupation and hairdressers are no exceptions. In the present study 15.8% of hairdressers who had some WRMSDs were aware about ergonomics, while relatively higher percentage of hairdressers who had no WRMSDs were aware about the ergonomics. The haircutting stations were congruent with the ergonomic check list. Minimal amount of twisting and bending were required due to the close placement of tools⁵. This indicates being aware about science in workplace will bring down the percentage of occurrence of WRMSDs.

Physical fitness in the current study was evaluated in terms of cardiovascular endurance, strength and flexibility. It was noted that the strength of the upper limb (80%) and flexibility of the lower limb (80.7%) were highly affected in the hairdressers. Further none of the hairdressers had excellent scoring for any of the physical fitness parameters. All of them scored average or poor on a grading of excellent, average

and poor. This may be due to the long working hours along with working for six days per week that the physical fitness of majority of hairdressers was affected.

Physical fitness is crucial and very vital for all professions. Physical fitness was co-related with neck pain in office workers in Thailand, and the authors concluded that participants with normal physical fitness level tend to have less prevalence of neck pain than that of participants with below normal physical fitness level⁷. Also a study was done in India where upper extremity and neck disability in male hairdressers with concurrent changes in pinch strength was assessed which concluded that awkward neck posture and repetitive work done by upper extremity exacerbates degenerative changes and increases risk of disability in hairdressers with increase in age and experience⁴. However there are no studies in the literature where overall physical fitness among hairdressers were assessed so as to compare the present study findings and comment upon.

The present study had a few limitations. The present study doesn't categorize the specific work done by hairdressers like massager, pedicurist, manicurist etc. The postural variations that were adopted by the hairdressers were not considered. In the current study work station/ job task analysis was not considered.

With this study conducted there is a scope of further studies that can be conducted on improvement of ergonomics on hairdressers to reduce musculoskeletal disorders and abnormal posture. Also the hairdressers can be categorized based on males and females and specific work done by them.

6. Conclusion

According to the present study there was a high prevalence of musculoskeletal disorders among hairdressers in Belagavi city, India. The most common affected body region was lower back followed by neck. As the years of work experience increased there is an increase in occurrence of work related musculoskeletal disorders. The study also concluded that majority of the hairdressers were not aware of ergonomics involved in job location.

In terms of physical fitness, it was noted that the strength of upper limb and the flexibility of lower limb was highly affected in the hairdressers, while all the other parameter like cardiovascular endurance, strength of lower limb and flexibility of upper limb scored average.

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