

## Prevalence of Upperlimb Musculoskeletal Pain among Hostel Housekeeper's

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**ABSTRACT: Introduction :** Work related musculoskeletal disorders of upper limb are one of the most common occupational disorders around the world. The pattern of occurrence of WRMSDs and its relation with ergonomic intervention among housekeepers has not been widely reported. The aim of this study was to conduct a questionnaire survey for musculoskeletal disorders among the housekeepers.

**Methods :** A randomized questionnaire survey was conducted among housekeepers. Subjects fulfilling inclusion criteria were taken. Disorders of the arm, shoulder and hand Questionnaires used as outcome measure. 100 subjects from different hostels were taken. After taking the consent, the DASH questionnaire was given to them and the answering procedure was explained to them and they responded accordingly. The participants were divided into two groups group A with age 20-39 and group B with age 40-59. Then using the t-test the disorder were seen according to the age group.

**Result and Discussion :** All the participants completed the study and used for data analysis. There was significant ( $p < 0.05$ ) decrease in pain in neck at activity in Group A compared to Group B. Thus, Group A showed more significant effect of ergonomic improvement than Group B. Hence, ergonomic intervention showed beneficial effect to reduce musculoskeletal disorders in housekeepers.

**Conclusion :** From this study it can be concluded that exercise with ergonomic intervention are effective in relieving upper extremity work related musculoskeletal disorders.

**Key words :** upper extremity work related musculoskeletal disorders, disabilities of arm, shoulder and hand.

Housekeeping are the upper limb musculoskeletal disorders are the most common health problem in the workplace accounting for considerable economic loss [1-7]. Musculoskeletal pain are impairments of body structures such as tendons, muscles, joints, ligaments, nerves, bones, or a localized blood circulation system caused or aggravated by the work [7-10]. While upper limb musculoskeletal disorders are defined as conditions which affect the soft tissues (tendons, muscles, joints, ligaments, and nerves) of the upper limbs [9,11-13].

Housekeeping is a physically demanding job that includes many tasks and housekeepers suffer from exposure to many high-risk factors for upper limb MSDs [14]. Many of the tasks are repetitive in nature such as bed making, buffing and vacuuming, emptying garbage, tidying, dusting, and cleaning floors. Moreover, housekeepers are engaged in push-pull task that result biomechanical strain factors such as joint torque, compressive and shear forces, and their influencing variables like specific muscle activity, body positioning, the direction of exertion, and workspace environment [13,15].

Adverse events due to upper limb represent a major source of disability globally and have a significant socio-economic impact [2, 19, 20]. Moreover, employees with upper limb MSDs experience physical and mental suffering and temporary or permanent limitations in their professional activities [21]. Many factors can be associated with upper limb MSDs. Different studies conducted showed that repeated lifting of heavy objects, prolonged bending of the overstretching, low job control, and low supervisor support are significantly associated factors with upper limb MSDs [16, 22, 23]. Furthermore, upper limb MSDs were not only

### I. CHAPTER 1

#### INTRODUCTION

associated with physical workplace factors but also with psychosocial factors like stress, lack or poor communication, and work ambiguity[24–26].

There is strong evidence that technical ergonomic measures and several kinds of interventions including organizational and personal measures can reduce the occurrence of upper MSDs [7, 27–32]. However, in most African countries including Ethiopia, little is known about the risk factors associated with and upper limb MSDs among hostel housekeepers. There is also little empirical evidence about the magnitude of the problem in Ethiopia. Therefore, this study aimed to determine the magnitude of and upper limb MSDs and identify the associated risk factors among hostel housekeepers.

“Occupational injury” is generally defined as an injury arising out of or in the course of employment resulting from the action of a physically or chemically traumatizing agent. Work related musculoskeletal disorders or occupationally related cumulative trauma disorders are syndromes characterized by discomfort, impairment, disability or persistent pains in joints, muscles, tendons or other soft tissues with or without physical manifestation.<sup>[1]</sup> Other predisposing factors to WMSDs include genetic predispositions, mental stress, physical conditioning, age and obesity, etc.<sup>[2]</sup> It is like that design of work place equipment or the environment or both and training workers in ergonomic principles may reduce the risk of workers developing these work related musculoskeletal disorders. At work, static muscle loading may occur because of prolonged awkward postures or the need of stabilize or manipulate tools or control.<sup>[3]</sup> High risk sectors include nursing facilities, air transportation, food processing, leather tanning and heavy and light manufacturing (vehicles, furniture, electronics products).<sup>[5]</sup>

Upper extremity musculoskeletal disorders are also highly prevalent in manual-intensive occupations, such as clerical work, postal service, cleaning, industrial inspection and packaging.<sup>[6]</sup> Many studies shows that there is high occurrence of pain in workers. Housekeeper’s job activity involves repetitive movements of cleaning, moping, sweeping which may lead to occupational related injuries in upper extremity.

According to the review of

epidemiological studies from 1966 to June 2004 the point prevalence of upper extremity musculoskeletal disorders in workers ranged from 30% to 47%.<sup>[7]</sup> The annual prevalence of pain in working populations ranged from 19% to 48%.<sup>[8]</sup> Recent studies shows that 81.48% sweepers shows pain while working. Prevalence of difficulty in activity of daily living in sweepers 54.54% and joint affected of upper extremity ranged is 81.8%. In sweepers, 22.72% people affected with pain and 31.81% people affected with shoulder pain.<sup>[9]</sup> Overuse injuries, Rotator cuff tendonitis, Traumatic injuries, Degenerative problems may develop in shoulders from many years of task specific work.<sup>[10]</sup>

Occupational risk factors includes Heavy physical work Sustained trunk posture ( stooping, reaching ), Prolonged sitting, Frequent bending and twisting of trunk, Lifting, lowering, pushing and pulling activities, Exposure to whole body vibration<sup>[11]</sup>

Ergonomic proves effective to reduce occupational disorders. Physical ergonomic factors like equipment design, improvement in posture, reduction in forces, proper lifting technique, work place modification may achieve as much as benefits to improve in health. Ergonomics can be considered a design philosophy that focuses on supplying a product that ensures safety, ease of use, comfort and efficiency.

Thus continued application of a combination of regular exercise, relaxation training, ergonomic intervention, work organization and work modification, team work, work- rest cycle and effective communication between the worker and supervisors helps in reducing musculoskeletal disorders among the hostel housekeepers.<sup>[12]</sup>

Ergonomic design and training intervention have been heavily promoted for the prevention of work related upper limb disorders. Victor CW Hoe et al shows that ergonomic factors correlate with musculoskeletal symptoms. Ergonomic training is also focused on modifying risk factors through education and empowerment of workers.<sup>[3]</sup>

Ergonomic focuses on the point where both the technological side of production and human side connects. The combination of the two interests ergonomists- the inter relationships of humans and their tools.<sup>[13]</sup> It focuses on the study of work performance with emphasis on worker safety and productivity. ergonomics focuses on humans and their interactions with

the environment.<sup>[14]</sup>

Hence this study was carried out to check prevalence of upper extremity work related musculoskeletal disorders in hostel housekeepers; To assess the effect of work place ergonomics training along with exercise intervention for upper extremity musculoskeletal disorders in hostel housekeepers.

### THE AIM OF IS STUDY

It was to compare effect of ergonomics along prevalence of upper limb musculoskeletal pain in hostel housekeeper's.

### NEED OF THE STUDY

Musculoskeletal disorders are described as the disorders of the muscles, nerves, tendons, ligaments, joints, cartilage and spinal discs. The term work related musculoskeletal disorders(WRMSD) implies to the musculoskeletal disorders which are worse and long lasting due to work conditions.<sup>1</sup>

WRMSD represents the most leading causes of the occupational injuries and are mostly caused by repetitive manual labor, lifting of heavy loads, overexertion and working in an awkward posture. These disorders have a serious impact on the quality of life and may cause restriction from work, absenteeism or even there can be a need to change job for the employees.<sup>2</sup>

Health care industry has also been affected by work related musculoskeletal disorders. Hostel workers include not only the health care providers but also the individuals who form the support staff and perform duties of cleaning, security, medical waste disposal and clerical work. In addition to these counselors, community health workers, emergency medical service workers and volunteers are also included.<sup>3</sup>

The ergonomic feature of a physical work is considered to be a risk factor for developing musculoskeletal disorders which include the rapid work pace, repetitive movements, forceful exertions, non-neutral body postures and vibrations.<sup>4</sup> Housekeeping is considered as one of the major workforce in the hostel industry. Moreover there is a tendency to recruit low wage workers. Female work force is considered to be more dominating and is characterized by low job control, low wages and few opportunities for career advancement. These factors may add to the perpetuation of WRMSD in this population and There is a evidence to state that the low wage jobs results in a higher burden of illnesses, injury and

disability.<sup>5</sup>

The injuries and illnesses might affect the performance of the work of the cleaners and hence might affect their efficiency. The tasks which are performed by the cleaners are very labor intensive and many of the cleaners may have to work in a limited time which leads to increase in their physical and mental stresses. Various tasks performed by the cleaners in the hostels are supply of towels, toilet items and cleaning materials using carts, keeping the storage areas neat and tidy. Cleaning of clinics, patient's rooms, pushing and pulling of furniture, sweeping and mopping the floor, washing windows, walls, ceilings, woodworks. Cleaners are required for preparing of the rooms for the meetings , arrange media equipments.<sup>6</sup>

There are numerous studies conducted to understand the emergence of WRMSD among health care workers, but only few addressing similar problems in the housekeeping staff of a hostel . The demands of housekeeping clearly indicate that housekeeping staff in a hospital may be considered as a vulnerable group, Little efforts have been made to identify the risk of injuries and prevalence of musculoskeletal disorders in this vulnerable group. Hence this study would like to address the housekeeping staff population in India.

### OBJECTIVES OF THE STUDY

- To find the prevalence of work related musculoskeletal injuries in housekeeping staff of a hostel.
- To calculate the risk score for occupational injuries

### HYPOTHESIS

- The prevalence of work related musculoskeletal disorders in housekeeping staff is high.
- Housekeeping staff of a hostel are at risk to develop a work related musculoskeletal disorder.

## II. CHAPTER -2

### LITERATURE REVIEW

#### RAHMAN AND HOSSAIN,(2010)

stated that one of the most common findings in garment industries is poor housekeeping i.e. untidiness, disorder, poor storage of materials and stock. Such disorder and clutter not only reduces productivity by "blocking" the smooth flow of materials through the factory, it often represents a fire hazard as boxes, thread, trimmings and other

combustible material is left everywhere. It also can encourage vermin and their associated health hazards.

It is all too common to see frayed wiring, broken plug sockets and wires dangling close to workers in many parts of a garment industry. Not only is there the 19 danger of electrocution, there is the possibility of starting a fire. When considering the poor housekeeping in many industries with combustible materials all over the floors and workbenches, it is easy to see how industry fires can start if the electrical wiring is in poor condition and not maintained on a regular basis (Ashokkumar, 2013).

Analytical results of hostel employer records of housekeeper injuries combined with evidence from earlier surveys showed that housekeepers face disproportionate rates of workplace injury, with strains and sprains as the leading type of injury, accounting for nearly half of all housekeeper cases. The contribution of working conditions and overexertion were also the leading cause of housekeeper injuries [Fru06].

**KINGMA AND VAN DIEEN (2008)** did a comparative study of sitting posture on an office chair versus exercise ball to find out static and dynamic postural loadings during computer work on 10 female subjects and reported that sitting on an exercise ball resulted in 33% more trunk motion and 66% more variation in lumbar EMG. However, the fifth percentile and average lumbar EMG were also higher when sitting on an exercise ball with 38% and 78% respectively. In addition, more spinal shrinkage occurred when sitting on an exercise ball than office chair. Arm flexion was reduced, but trapezius activation was unaffected when sitting on an exercise ball.

**LYNN AND NIGEL (1993)** studied RULA (Rapid Upper Limb Assessment) a survey method developed for use in ergonomics investigation of work places where work related upper limb disorders are reported. This requires no special equipments in providing a quick assessment of the posture of the , trunk and upper limbs along with muscle function and the external loads experienced by the body and has proven its reliability and validity for use as a screening tool or incorporated into a wider ergonomics assessment of epidemiological, physical, mental, environmental and organizational factors.

**TSANG AND MAK (2004)** studied to establish the test-retest reliability of sit-and-reach test and to determine the capacity of sit-and-reach test to predict mobility of patients recovering from

acute stroke and concluded that performance in sit-and-reach test was reliable and can significantly predict the mobility of patients with acute stroke at discharge.

**DEVERUX et al.(2002)** conducted a study on 891 computer operators and technicians out of 1514 office workers to investigate the potential interaction between physical and psychosocial risk factors at the workplace that may be associated with symptoms of musculoskeletal disorders of and upper limb. They found out workers highly exposed to both physical and psychological workplace risk factors were more likely to report symptoms of musculoskeletal disorders than workers highly exposed to one or other. There was a definite interaction between physical and psychosocial risk factors in the workplace that increased the risk of reporting symptoms of upper limbs.

**SCHELL et al.(2008)** conducted a study to identify the association between stress biomarkers shoulder and back pain in healthy media workers and found that the individuals in working life with a high level regenerative/anabolic activity has less pain than others.

**ANACLAUDIA GASTAL FASSA et al (2005)** conducted an epidemiologic survey assessed the prevalence of musculoskeletal disorders in several anatomic sites in children aged 10–17. The study found an increased risk of musculoskeletal pain and back pain among children working in manufacturing and domestic services when compared with non workers and workers in retail. The exposure to awkward posture and heavy physical work increased the risk of musculoskeletal pain and were important intermediate variables in the association between work activity and this outcome. Awkward posture, monotonous work, and noise increased the risk of back pain and were important mediators in the association between work activity and back pain.

**DANIELLE,et al (2000)** analyzed the occupational risk factors of shoulder pain. 29 Studies were included in the review; three case-control studies and 26 cross sectional designs. The median method score was 60% of the maximum attainable score. Potential risk factors related to physical load and included heavy work load, awkward postures, repetitive movements, vibration, and duration of employment. Consistent findings were found for repetitive movements, vibration, and duration of employment (odds ratio (OR) 1.4–46 in studies with method scores • 60%). Nearly all studies that assessed psychosocial risk factors

reported at least one positive association with shoulder pain, but the results were not consistent across studies for either high psychological demands, poor control at work, poor social support, or job dissatisfaction

**VAN DER WINDT (2000)** in their study it was revealed the prevalence of 12-month shoulder pain varied from 6-40% in different working populations. The study consisting of 7,217 adults (aged > 30 years) about 30% reported having had shoulder pain during the previous month. The risk factors for shoulder pain were related to heavy physical workload, awkward postures and long work experience, repetitive movements and duration of employment were associated with of shoulder pain.

**VIKARI JANNETURA et al (2001)** conducted a study to find the impact of psychosocial factors on the computer use factors in the development of musculoskeletal disorders in the computing workplace. A questionnaire-based study was undertaken to test this hypothesis in a sample of 67 call center workers. It was found that overall; computer use factors were significantly associated with self-reporting of musculoskeletal disorder symptoms, whereas psychosocial factors had no such association. However, certain individual psychosocial factors emerged as having a significant association with musculoskeletal disorder symptoms. The findings suggest that specific areas of call centerwork have associations with poor worker health and possible long-term musculoskeletal disorder problems. These areas appear to be workload and particular management-worker relations, rather than computer use.

**HANSSON AND WESTERHOLM (2001)** investigated the prevalence of musculoskeletal disorders and trends with psychosocial risks, across age and gender. The study group consisted of 200 female and 132 male employees from varied occupations within Ireland, ranging from age 18-66 years. The most prevalent symptoms of musculoskeletal disorders were for the lower back, shoulder and neck regions. The prevalence of age and gender differences was evident for these regions. There was a general trend for increasing prevalence with age.

### III. CHAPTER 3

#### METHODOLOGY

This study was conducted on 100 housekeepers working in Hostel. Written informed consent was obtained from participants was given to them explanation of study.

#### Inclusion criteria

- Age group 20-60 years,
- Experience of housekeeping should be minimum of 3 months
- Minimum 8 hours working per day

#### Exclusion criteria

- Patient with neurological deficit, or any congenital defect
- Traumatic injury to upper limb.

**Procedure :** First , screening was done on 100 housekeepers and prevalence of MSP was assessed. Samples were selected who are employed to perform household activities like sweeping, mopping, dusting.

They were divided into two groups named group-A with age 20-40 and group-B with age 41-59. Conservative treatment given for the participants of group A and B. For pain, isometric exercise , stretching of upper, middle trapezius and pectorals was given. And Myofascial release for upper trapezius was also given. Home exercise was also taught to all participants, which includes retractor strengthening, Isometric exercise and self-stretching with five repetition of each exercise. Participants also advised for hot water fermentation for 10 minutes using hot water bag at home. For shoulder pain, Maitland mobilization, scapular setting exercise, shoulder isometric was given. Along with the conservative treatment ergonomic intervention was also given for 2 weeks. Ergonomic advice given to Group A. Ergonomics advice was decided according to their posture and work related problems. Advice were given in their normal routine activities like: Sweeping, Mopping, High dusting, Lifting garbage, Wringing mops, Cleaning tilewalls.<sup>[17]</sup>

Dependent variables included Numerical Pain Rating Scale (NPRS), upper limb pain questionnaire. Data was obtained for each subject on 1<sup>st</sup> day before treatment and after 2 weeks of protocol. Data was collected for each subject by calculating the average value of the variables of all the 30 subjects and then the statistics were conducted. Analysis done with the use of primer software. Parametric testing was used to compare groups since the quantitative dependant variables were reasonably normally distributed. Paired t-tests were used to compare quantitative outcomes within group. Independent t- tests were used to compare quantitative outcomes between the two independent groups. Confidence Interval was kept at 95%. Since the p value > 0.005 in this study, the groups

werecomparable.

**SOURCE OF DATA**

Subjects will be recruited from different hostels of dehradun.

**METHOD OF DATA COLLECTION**

**STUDY DESIGN:** Cross sectional study

**SAMPLING TECHNIQUE:** Purposive sampling.

**SAMPLE SIZE:**220

**INCLUSION CRITERIA**

- Housekeeping staff in different hostels of dehradun.

- Gender: males and females
- At least six months of experience

**EXCLUSION CRITERIA**

- Injuries due to trauma
- Workers who have any other musculoskeletal problems prior to their current work
- Workers who have any congenital and structural problem

**TOOL OF THE STUDY**

- Upper limb pain questionnaire (ADLs)
- Nordic musculoskeletal pain questionnaire

**UPPER EXTREMITY PAIN QUESTIONNAIRE**

**Patient Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Please indicate all areas where you are experiencing pain:

Upper Arm (Front / Back / Medial / Lateral)     Lower Arm (Front / Back / Medial / Lateral)

Elbow (Medial / Lateral)     Wrist (Medial / Lateral)     Hand (Top / Bottom)

How long have you had pain?

Is your pain rapidly getting worse? Yes / No

Is your pain secondary to major trauma (car accident, fall from height, sports)? Yes / No  
 If yes, describe in detail:

Is your pain secondary to minor trauma or repetitive stress from work or sports? Yes / No  
 If yes, describe in detail:

Do you have a history of cancer or blood clots? If Yes, Describe: Yes / No

Have you recently experienced fever, chills or unexplained weight loss? Yes / No

Have you recently experienced a bacterial infection, IV drug use or immune system suppression from corticosteroids, transplant or HIV? Yes / No

Are you experiencing pain that cannot be made to feel worse or better with any specific movement or position? Yes / No

Is your pain associated with other symptoms in your arms (numbness, tingling, burning, etc.)? Yes / No  
 Describe in detail:

Is your pain associated with difficulty balancing or gripping? Yes / No

Is your pain associated with changes in neck or shoulder function? Yes / No

Is your pain induced by coughing, sneezing, straining, or bending forward? Yes / No

Is your pain associated with numbness or tingling in your arms or hands? Yes / No

What specifically aggravates your pain?

<input type="checkbox"/> Sitting	<input type="checkbox"/> Standing	<input type="checkbox"/> Coughing	<input type="checkbox"/> Sneezing
<input type="checkbox"/> Gripping	<input type="checkbox"/> Lying Down	<input type="checkbox"/> Walking	<input type="checkbox"/> Lifting
<input type="checkbox"/> Computer Work	<input type="checkbox"/> Driving Car	<input type="checkbox"/> Jumping	<input type="checkbox"/> Stretching
<input type="checkbox"/> Bending Forward	<input type="checkbox"/> Bending Back	<input type="checkbox"/> Bending to Left	<input type="checkbox"/> Bending to Right
<input type="checkbox"/> Bowel Movements	<input type="checkbox"/> Pushing / Pulling	<input type="checkbox"/> Running	<input type="checkbox"/> Squatting
<input type="checkbox"/> Arms overhead	<input type="checkbox"/> Other, describe:		

What specifically alleviates your pain?

<input type="checkbox"/> Nothing	<input type="checkbox"/> Lying Down	<input type="checkbox"/> Hot Packs	<input type="checkbox"/> Cold Packs	<input type="checkbox"/> Massage	<input type="checkbox"/> Manipulation
<input type="checkbox"/> Exercise	<input type="checkbox"/> Stretching	<input type="checkbox"/> Traction	<input type="checkbox"/> Electrical Stimulation	<input type="checkbox"/> Ultrasound	
<input type="checkbox"/> Medications, describe:					
<input type="checkbox"/> Resting in specific position, describe:					
<input type="checkbox"/> Other, describe:					

How would you describe your pain?

Dull                       Aching                       Burning                       Sharp / Stabbing                       Electrical

Pins / Needles                       Deep                       Superficial                       Tingling                       Numbing

Other, describe:

Does your pain spread? Yes / No

If it spreads, where does it start and where does it go?

If it is pin-point pain, where is it?

On a scale of 1 to 10, 1 being very minimal pain and 10 being the worst pain you can imagine, circle how you would rate your pain:

At its best: 0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10

At its worst: 0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10

On average: 0-----1-----2-----3-----4-----5-----6-----7-----8-----9-----10

What % of the time do you experience your pain?

Daily: 0%-----25%-----50%-----75%-----100%

Weekly: 0%-----25%-----50%-----75%-----100%

Monthly: 0%-----25%-----50%-----75%-----100%

Does your pain interfere with your ability to:

Sleep, describe:

Work, describe:

Exercise, describe:

Other, describe:

At what time of the day is your pain at its worst?

At what time of the day is your pain at its best?

Have you experienced this pain before? Yes / No

**History of Previous Evaluations / Treatments for Your Pain**

Who have you seen previously for your pain? Describe who, when, diagnosis and treatment previously received:

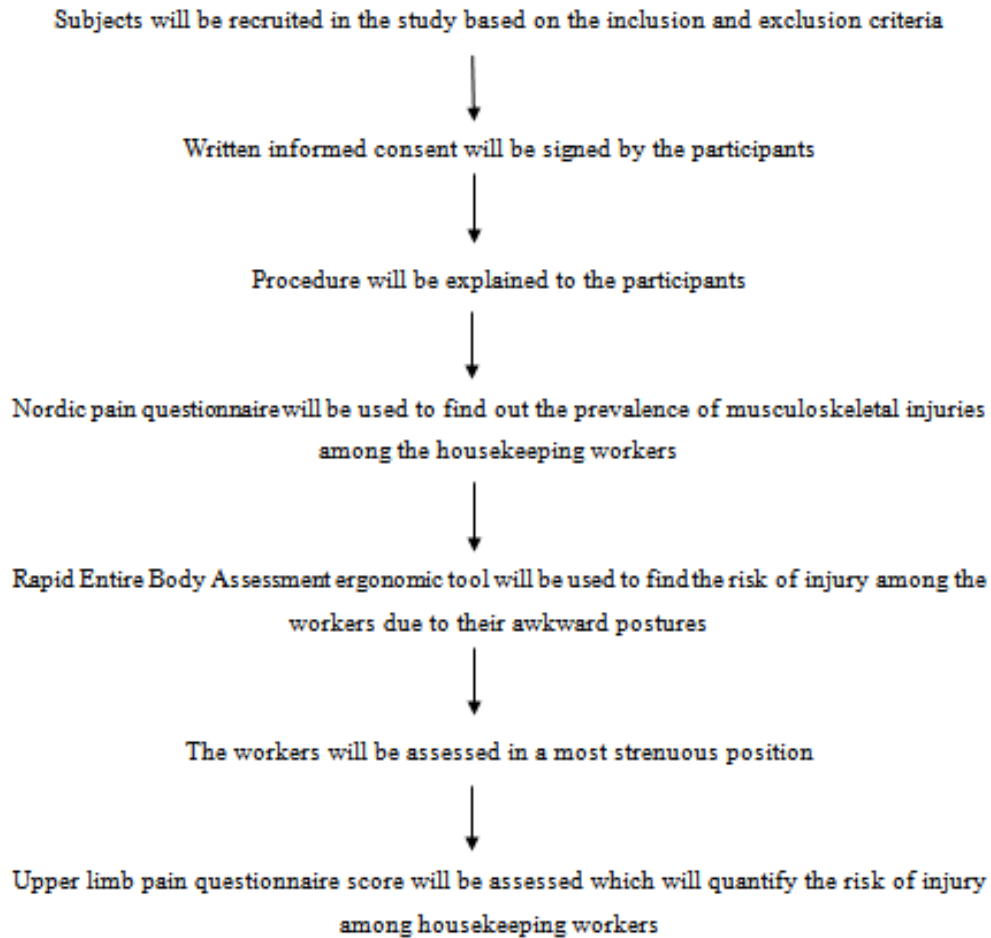
Have you received any special tests previously for your pain i.e. MRI, X-ray? Describe:

Which previous treatment(s) did you find most beneficial?

Which previous treatment did you find least beneficial?

What do you think is causing your pain?

**PROCEDURE:**



**STATISTICAL ANALYSIS:**

- Nordic pain questionnaire will be summarized using Mean, Standard Deviation and Percentages.
- UEPQ score will also be summarized using Mean and Standard Deviation.

**IV. CHAPTER 4  
RESULT AND DISCUSSION**

A total 80 Housekeepers were screened, 30 were participated in study. Table 1 shows the demographic characteristics of participants. The two groups did not differ significantly in terms of their age, working hours and years of experience.

**FORMULAE USED FOR DATA ANALYSIS**

1. Mean

$$\bar{X} = \frac{\sum x}{n}$$

n= number of subjects  
 $\sum x$ = each subject value

$\bar{X}$ = mean

2. Standard deviation



$$\sigma = \sqrt{\frac{\sum(X - \bar{X})^2}{n}}$$

X = value of the variable

$\bar{X}$  = arithmetic mean

n = number of observation

### 3. T - Test

$$t = \frac{x - \mu_0}{s/\sqrt{n}}$$

**Table 1** Demographic Variables (n=65)

Characteristic	N	%	Mean	SD
<b>Gender</b>				
Male	39	60.0	-	-
Female	26	40.0		
<b>Age</b>				
<20	3	4.6		
21-40	52	80.0	29.9	8.4
>41	10	15.4		
<b>Working Experience (Year)</b>				
1-5	61	93.8	2.4	2.5
>6	4	6.2		
<b>Weekly Working Time (Hours)</b>				
40-50	65	100.0	46.5	3.1
>51				
<b>Body Mass Index(BMI)</b>				
Underweight	2	3.1	Normal	
Weight	47	72.3	23.5	2.8
Overweight	14	21.5		
Obesity	2	3.1		
<b>Hand Dominance</b>				
Right-handed	53	81.5	-	-
Left-handed	12	18.5		

Figure 2 showed the number of self-reported symptoms occurring in the last 12 months which the highest MSDs experienced among male room attendants was lower back with a percentage of 51.3% while the lowest prevalence involving shoulders and ankles/feet with a percentage of 0% for both. Meanwhile the highest musculoskeletal trouble among female room attendants involving

wrists/hands and low back with a percentage of 69.2% for both while the lowest prevalence among them were neck and ankles/feet with a percentage of 3.8% for both. The highest prevalence among room attendants both male and female was low back region with a percentage of 60% while the lowest prevalence was ankles/feet with a percentage of 1.5%.

Number of Self-Reported Symptoms

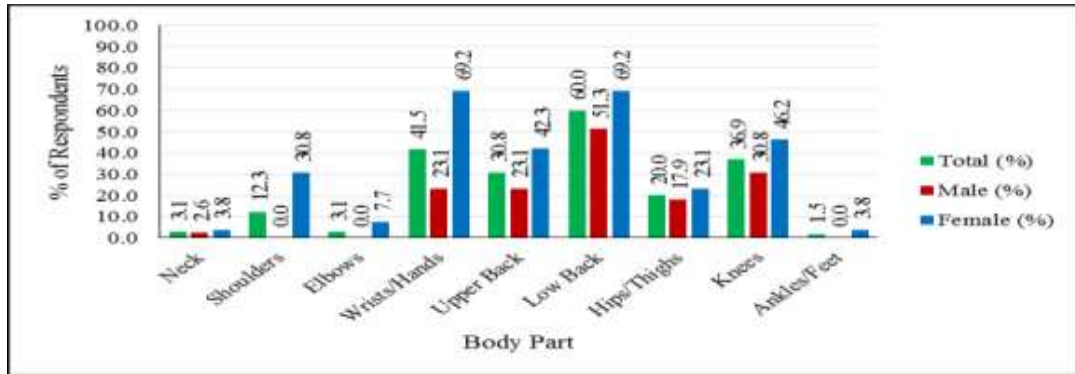


Figure 2 Percentages of Nordic Questionnaire Respondents with Body Part Trouble in Last 12 Months

**Reported Lower Back, Neck and Shoulder Trouble**

According to Table 2, during the past 12 months, none of room attendants sought a professional for any musculoskeletal trouble, meanwhile there was 1 (1.5%) room attendant had been hospitalized due to lower back problem which lead to change in job or duty. The highest body part trouble experienced by room attendants was lower back (60%) followed by shoulder (12.3%) while the least body part trouble experienced by them was neck (3.1%). Most of room attendants (32.3%) suffered lower back trouble for about 8 to 30 days, followed by 24.6% for more than 30 days total in the last 12 months. There were also 3.1% of room attendants who

suffered lower back trouble for about 1 to 7 days in the last 12 months. Lower back symptom severe enough and resulted to reduce room attendants' leisure activity with a percentage of 7.7% and work activity with a percentage of 1.5%. However, 9.2% of room attendants reported that they were prevented from work for about 8 to 30 days while 4.6% of them were prevented from work for about 1 to 7 days in the last 12 months due to lower back trouble. Besides, there were 3.1% of room attendants who experienced neck trouble and 10.8% of them had shoulder trouble for about 8 to 30 days in the last 12 months. Not to mention that there was 1 (1.5%) room attendant reported had shoulder trouble for about 1 to 7 days in the last 12 months.

Table 2 The Prevalence of Musculoskeletal Symptoms by Body Parts among hostels housekeepers (n=65)

Symptoms	Lower Back, % (n)	Neck, % (n)	Shoulder, % (n)
Any trouble ever	60.0 (39)	3.1 (2)	12.3 (8)
Ever had in accident	0 (0)	0 (0)	0 (0)
Change job or duty	1.5 (1)	0 (0)	0 (0)
Total time with trouble last 12 months			
0 days	0 (0)	0 (0)	0 (0)
1-7 days	3.1 (2)	0 (0)	1.5 (1)
8-30 days	32.3 (21)	3.1 (2)	10.8 (7)
More than 30 days, but not every day	24.6 (16)	0 (0)	0 (0)
Everyday	0 (0)	0 (0)	0 (0)

Reduce of work activity last 12 months	1.5 (1)	0 (0)	0 (0)
Reduce of leisure activity last 12 months	7.7 (5)	0(0)	0(0)
Total time prevented work last 12 months	4.6 (3)	0 (0)	0 (0)
1-7 days	9.2 (6)	0 (0)	0 (0)
8-30 days	0(0)	0(0)	0(0)
More than 30 days	0 (0)	0 (0)	0 (0)
Sought a professional	1.5 (1)	0(0)	0(0)
Hospitalized			

Hostels housekeeper's also had high prevalence of musculoskeletal symptoms which prevented them from doing their normal work and some of them had certain body parts trouble in last 7 days. Table 3 is presented 12-month prevalence of musculoskeletal symptoms and work interference by anatomical region. For the body parts'' trouble in last 12 months had been discussed as shown in Figure 1.

Based on Table 3, the highest prevalence of musculoskeletal symptoms among Hostels

housekeeper's which prevented them from doing normal work involving lower back (13.9%) followed by upper back (6.2%) and the least prevalence among them were knees and hands/wrists which both at 1.5%. Some of room attendants had high prevalence of musculoskeletal symptoms in the last 7 days which involved lower back (20%) and upper back (3.08%) while the least prevalence among them were hands/wrists and hips/thighs which both at 1.5%.

**Table 3** Twelve-month Prevalence of Musculoskeletal Symptoms and Work Interference by Body Region (n=65)

<u>Anatomical Region</u>	<u>Any trouble last 12 months</u> <u>.(n)</u>	<u>Prevented from normal work, %</u> <u>(n)</u>	<u>Trouble last 7 days,</u> <u>%(n)</u>
<b>Upper Extremity</b>			
Shoulders	12.3 (8)	0 (0)	0 (0)
Elbows	3.1 (2)	0 (0)	0 (0)
Hands/Wrists	41.5 (27)	1.5(1)	1.5 (1)
<b>Lower Extremity</b>			
Hips/Thighs	20.0 (13)	0 (0)	1.5 (1)
Knees	36.9 (24)	1.5 (1)	0 (0)

Ankles/Feet	1.5(1)	0(0)	0(0)
<b>Axial Skeleton</b>			
Neck	3.1 (2)	0 (0)	0 (0)
	30.8		
Upper back	(20)	6.2 (4)	3.1 (2)
	60.0		20.0
Lowerback	(39)	13.9(9)	(13)

Low back and wrists/hands pain are widespread problems among hostels housekeeper's in this study. The majority of selected subjects also reported several ergonomic problems involving awkward posture and highly repetitive motion due to their housekeeping tasks such as cleaning room, mopping and polishing toilet. Besides that, workers involving heavy lifting usually associated with low back pain especially in manufacturing industry (Kadikon & Rahman, 2016).

According to previous study, the highest prevalence of musculoskeletal disorders among hostel housekeeper's was low back (52.7%), followed by wrists/hands (46.5%) and the least prevalence was elbow region (27.3%) (Jong-Yu et al. 2004). These results strongly supported by previous research which found that symptoms in the lower back were most prevalent (49%) followed by the wrists/hands (43%), ankles/feet (35%), and shoulders (25%) (Kirtigandha et al. 2011). Furthermore low back pains are a common complaint among Hostels housekeepers due to their bad working posture for housekeeping tasks (Andrews, 2009). Additionally, the highest prevalence among hostel housekeeper' s in Las Vegas was reported for very severe pain in the lower back with a percentage of 40% and upper back with a percentage of 38% (Krause et al.2005).

There were 205 workers in housekeeping service which more than 24% of them experienced workplace musculoskeletal injuries involving back injuries which caused by overexertion (Cheng & Chan, 2009). However, heavy workloads are correlated with musculoskeletal symptoms such as low back pain, shoulder injuries, bursitis of the knee, neck and wrist pain (Liladrie, 2010).

In one questionnaire study based on Work Environment Authority, it is proven that during the period of 1997 to 2001 about 46% of Hostels housekeeper's had trouble in the upper back, 43 % had pain every week in their hip, leg, knee and

ankle. 39 % had pain and discomfort in the lower back (Swedish Work Environment Authority, 2005). Meanwhile according to previous study of 941 Las Vegas housekeepers, 83% of them were taking pain medication for musculoskeletal discomfort due to work and 62% were forced to visit a doctor and prevented from normal work due to MSDs (Catherine, 2007).

In term of ergonomic hazards which involved in housekeeping tasks, most of the time room attendants experienced awkward postures such as bending over or kneeling or reaching overhead for a long time while making beds or cleaning tasks (The Work Comp Experts, 2012). Cumulative injuries of body parts most affected due to awkward posture for room attendants were back (40%), hands/wrists (22%), shoulder (13%) and other (25%) (SRI-Ergonomics, 2016).

## V. CHAPTER 5

### CONCLUSION

It can be concluded that exercise and ergonomic intervention are effective in relieving upper extremity work related musculoskeletal disorders. However, on comparison ergonomic intervention showed more better results to alleviate the pain.

A higher proportion of hostel housekeepers were found to be affected by neck and upper limb musculoskeletal disorders in Gondartown. Age, rest period taken, repetitive movement, reaching/overstretching, organization concern for health and safety, and satisfaction were the work-related risk factors significantly associated with neck and upper limb MSDs. Therefore, ergonomic, organizational, and personal measures, which focus on minimizing repetitive movement and awkward working position and facilitating rest break with exercise, are important to reduce neck and upper limb musculoskeletal disorders among hotel housekeepers.

### LIMITATION OF THE STUDY

1. Not undertaking ergonomic audits of workstations and activities was one of the limitations of the study.
2. This study was a questionnaire-based cross-sectional study, the possibility of recall bias could not be ruled out since more serious and recent pains or troubles remembered better than less serious and older one.

### DECLARATION

I hereby declare that the dissertation "PREVALENCE OF UPPER LIMB MUSCULOSKELETAL PAIN AMONG HOSTEL HOUSEKEEPER'S" is the original work done by me at Department of Physiotherapy, Dolphin (PG) Institute of Biomedical & Natural Sciences, Dehradun, Uttarakhand. This work part or full has not been submitted to any other University.

### Dedication

To the almighty,  
for offering their blessings that made me strong up the hurdles of life.

To my parents,  
Whose love and sacrifice over the years have opened Countless Opportunities.

To my Teachers  
Who took me to this position.

To my Friends

To have provided me with continuous  
Inspiration and Encouragement

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Finally, I thank God for giving me such a valuable place on this world and blessing me with

knowledge and wonderful life with which I am able to mark myself by completing this study successfully.

### LIST OF ABBREVIATIONS

ART, active release technique;  
DSTM, dynamic soft tissue mobilization;  
DDMT, dynamic deep muscle tissue

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