Work Related Musculoskeletal Problems Faced By the Washroom Cleaners Working In Malls

Dr. Manjit Kaur Chauhan[1], Ms. Priyanka Patel[2]

[1]Associate Professor and [2]M.Sc. in Resource Management & Interior Design, Department of Resource Management, SNDT Women's University, Juhu, Mumbai – 400 049, Maharashtra, India

Abstract: **The present study focuses on the musculoskeletal problems faced by the washroom cleaners working in malls of Mumbai City. Cleaning activities are considered to be physically demanding and should be done without exposing workers to the risks of accidental injury or work-related ill health. Numerous investigations have shown, however, that cleaners are at risk of developing MSDs of the back, neck, shoulders, elbows, hands and lower limbs as a result of their work [1].**

Here, an attempt has been made to study and assess the job activities and work related musculoskeletal problems and other postural problems especially among the women workers working as housekeepers/cleaners in the Malls of Mumbai City. For the study a sample of 30 housekeepers was selected from 5 similar types of malls (based on size and the number of the visitors). An Interview Schedule was developed based on the observations and the pilot study in the malls OWAS technique was used to assess the various postures adopted at work using photographic technique. The activities performed by housekeepers were cleaning floor, walls, commodes, sinks, and mirrors and throwing the sanitary waste. The finding of the study revealed that 53.3% and 26.6% females felt that the overall job to be very heavyand heavy respectively. Whereas 46.6% and 30% females perceived throwing sanitary waste and commode cleaning to be heavy tasks respectively. It was also seen that all these activities were repeated minimum for at least 5 – 7 times and sometimes 8 – 10 times daily by the housekeepers thus leading to excessive bodily pain and discomfort due to repetitive movements involved. Almost all the women workers reported of having pain in neck, shoulder, wrist, low back and knee. But in terms of intensity of pain, the workers had very severe pain in Low back (96.7%), wrist (76.7%) and shoulder (70%), followed by upper back (60%) and neck (53.3%) region. The overall job was rated as very heavy. Activities like cleaning platform, sink and commode were rated as heavy activities. Similarly the postural analysis by OWAS technique put these activities into action category – 3 where corrective measures were needed as soon as possible. Thus, confirming to the result of RPE rating as heavy activities for cleaning platform, sink and commode. The study proposes to recommend of having training programs for maintaining right posture at work, use of ergonomically designed equipment's for cleaning, regular medical check-ups and to have exercise regime for workers and finally to the designers of the washroom in the malls to design keeping in mind the stress it is going to put on the cleaners while cleaning and not just aesthetics.

*Keywords***: Housekeepers, cleaning, posture, washroom cleaners. MSD, OWAS.**

1.   INTRODUCTION

Over the past few years there has been tremendous increase in the number of malls in almost all metropolis cities of India and especially in Mumbai City. Malls being the commercial shopping and entertainment centers' in cities there is a stiff competitionto stay in the market and satisfy the customers or visitors. This has significantly increased pressure on marketers for sustainability resulting in organizational restructuring to cut costs and to increase revenue flows [2]. The management of these malls has significantly diminished on the investment on the housekeepers and cleaners and thus started outsourcing them from agencies. Due to this the job of housekeepers have become unstable, less satisfying simultaneously increase in job stress and health problems [3].

Work Related Musculoskeletal Disorders (WRMSD's) are common health problem throughout the world. Many researches on health issues and musculoskeletal disorders among cleaners have been reported from various countries, especially in USA, Australia, Europe, U.K and others. Very few studies have been conducted in India. In one of the study on cleaners it was concluded that the job of cleaning is very demanding and involves various awkward work postures putting stress on different body parts like arms, shoulders, legs, back and neck as they have to work in a small and confined area leading to deterioration of health [4]. Similarly the need was felt to identify the WMSDs among washroom cleaners of malls in Mumbai and the intensity of perceived body pain.

For most of us, cleaning is a particularly interesting type of work for several reasons: it is subject to a fairly strict sexual division of labour [5, 6, 7]; it is considered to be a traditional task for women; and even though cleaning is associated with significant risks for musculoskeletal problems [8, 9] and with health problems derived from exposure to cleaning products [10,11], many employers and even some union activists believe that cleaning rooms is a natural and undemanding activity, done without problems by many women. Generally cleaning job is acknowledged to be low in status resulting in poor wages, unpleasant work, seen as a peripheral job rather than main job [3] and no respect for the cleaner. All this has considerable impact on lowering the self-esteem, physical and mental health of the cleaner. Since the cleaner's job is considered low status the management doesn't even consult them when purchasing cleaning equipment's especially for their use, neither choice is given to them nor pre testing is done. Many a times the equipment's are not ergonomically viable but still the workers have to work with them. Such poor ergonomic design can have considerable implications for physical injuries to the body, over both the short and long term, yet these and other physical challenges of cleaning are generally underestimated. Considering the type of work and work pressures and use of various equipment's for cleaning leading to health problems physically and mentally, the study was undertaken with following objectives.

Objectives of the Study:

The objectives of the study were to explore different activities performed by the washroom cleaners in the mall, to identify the workload as perceived for each of the activities by cleaners, to assess the postures adopted for different activities and finally, to identify MSD and other health problems faced by housekeepers cleaning washroom areas in malls of Mumbai.

2. SUBJECTS AND METHODS

Method: The method used for the study was Survey Method.

Locale of the Study: Five similar types of malls from Mumbai city were selected.

Sampling and Sample size: The purposive sampling method was used for the selection of samples. Thirty women washroom cleaners from five different malls, 6 from each mall were part of the study. The age of the housekeepers was ranging between 20 – 50 years.

Inclusion Criteria: Only those women worker with work experience of minimum one year as a housekeeper, having good general health status and given full consent to participate, were selected for the study.

Exclusion Criteria: The subjects who had undergone any type of surgery or with cardiovascular problems or have severe MSD problems were excluded from the study.

Study Tools: Each participant of the study was subjected to following:

1. **Observation-** Observations in the form of checklist were made to list down the activities performed by the housekeepers. The observations were also made to know how many times a particular activity was repeated in a job shift.

2. **Interview Schedule – An Interview Schedule** was developed to gather the information on:

- *Socio-Demographic Status* of the Women workers

- *Activities Performed*–To study the different activities carried out in their 10-12 hours shift.

- *RPE Scale*–The 5- Point RPE Scale was used to know the exertion experienced by the housekeepers. [12].

SCALE	RATING OF PERCIEVED EXERTION
1	Very Light
2	Light
3	Moderately Heavy
4	Heavy
5	Very Heavy

- *Body Pain Assessment* – Verbal Descriptor Scale for pain was used to assess the pain in different body parts using Body Map for pain sites.

3. **Photography Technique –** Used to assess different postures adopted by the workers while performing cleaning activity.

4. **Posture Analysis Using OWAS Technique –**OWAS is a method for the evaluation of postural load during work. The OWAS method is based on a simple and systematic classification of work postures combined with observations of work tasks. The method can be applied for the development of a workplace or a work method, to reduce its musculoskeletal load and to make it safer and more productive [13]. Based on the picture clicked and the observation made, the posture was evaluated and classified into the action category as below:

Action Category for Evaluation of Posture	
1	No Corrective Measures
2	Corrective Measure in the near future
3	Corrective Measures as soon as possible
4	Corrective Measures immediately

3.   RESULTS AND DISCUSSION

The results of the survey showed that the women washroom cleaners from the malls of Mumbai belonged to the age group of 20 – 50 years with work experience of 1 to 30 years (Table 1.). The socio – economic status of the workers was poor with educational qualification within 12th Pass category.

Table 1: Age and Work Experience of the Cleaners Working in Malls.

Malls	Age Range of Cleaners			Working Experience (years)		
	20-30yrs.(%)	30-40yrs.(%)	40-50yrs.(%)	1-10 yrs.	10-20 yrs.	20-30 yrs.
Mall A (n=6)	2(33.34)	3(50.00)	1(16.67)	-	2(33.34)	4(66.67)
Mall B (n=6)	2(33.34)	4(66.67)	-	-	3(50.00)	3(50.00)
Mall C (n=6)	1(16.67)	3(50.00)	2(33.34)	1(16.67)	3(50.00)	2(33.34)
Mall D (n=6)	2(33.34)	2(33.34)	2(33.34)	1(16.67)	3(50.00)	2(33.34)
Mall E (n=6)	1(16.67)	3(50.00)	2(33.34)	1(16.67)	4(66.67)	1(16.67)
Total (%)	8 (26.67%)	15(50%)	7(23.33%)	3(10%)	15(50%)	12(40%)

Note: Figures in parenthesis indicate percentages.

Table 1. shows that 50% of the women cleaners belonged to the age group of 30 – 40 years followed by 20 – 30 years (26.67%) and 40 – 50 years (23.33%) respectively. With respect to work experience it was observed that 50% of female cleaners had experience of 10 – 20 years followed by 20 – 30 years (40%) and 1- 10 years (10%) respectively. In a study on MSD problems among Solid Waste Collectors [14] the subjects belonged to similar age group wherein the 78.3% were above 40 years of age with more than 15 years of work experience. In another study on the issues of ageing in cleaners, the sample of cleaners in Denmark (1166 cleaners), 60% were 45 years old or greater [15].

The results of the observations made revealed that the activities performed by the washroom cleaners were highly repetitive in nature involving various awkward postureslike leaning, bending, twisting, stooping and arms raised and abducted. The activities performed included cleaning floor (sweeping & mopping), commode cleaning, sink and platform cleaning, wall cleaning, mirror cleaning and throwing sanitary waste.

Page | 294

The cleaners used various types of brushes and mopes for cleaning purposes. For example long handled mope, small handled wipers for mirrors and walls, small handled angled brush for commode, scrubbers, synthetic absorbent cloth for wiping sink and platform, etc. While cleaning it was seen that they adopted various awkward postures especially leaning forward with one orboth arms abducted when cleaning wash basin, walls, mirrors, platform as the depth of the platform was too high especially for women workers with short stature. Commode cleaning was another task leading to awkward posture which included lots of frequent bending and twisting to reach to clean.

Table 2. Describes the activities and posture adopted while performing daily cleaning activities in the washroom of the malls.

Table 2: Description of Activities Performed, Equipment's Used, Postures Adopted and Assessment of Postures Using OWAS Technique

Posture No.	Activities Performed	Equipment Used	Posture Adopted	*Action Category of OWAS
1.	**Cleaning floor**	Long Handled Mope	Standing and forward and backward bending with repetitive movement of arms and wrists.	2
2.	**Cleaning Walls**	Duster / wiper with small handle	Standing on toes & Forward Bending on one leg / leaning with arms abducted above shoulder level	2
3.	**Cleaning Mirror**	Duster / wiper with small handle	Standing on toes & Forward Bending on one leg/ leaning with arms abducted above shoulder level	2
4.	**Sink & Platform Cleaning**	Wiper / scrubber / small brush with handle	Standing on toes & Forward Bending & twisting / leaning with arms abducted below shoulder level and reaching to extremes	3
5.	**Commode Cleaning**	Short handled brush	Standing on toes & Forward bending, stooping and twisting with arms abducted above shoulder level	3
6.	**Throwing away Sanitary Waste**	Cart to put dustbin and pull / push	Forward Bending / leaning with arms abducted below shoulder level and pulling/pushing cart	2

Note: *Action Category 2 – Corrective measures needed in near future.

*Action Category 3 – Corrective measures needed as soon as possible.

OWAS technique was used to assess the various posture assumed by the cleaners. The results presented in table 2. revealed that sink, platform and commode cleaning activities needed urgent attention as they involved higher risk postures that needed immediate corrective measures. This may be associated with the fact that these activities are performed in varied, unstable and strained postures for longer period of time. This also can be associated with the sizes of the commodes and platforms. It was observed that in almost all malls the depth of the platform was of huge concern for cleaners. For commode cleaning the issue was size of the toilet and to top it up the problem as how to reach to clean the sides and backside cleaning of commode areas. This puts excess of stress on cleaners. For the otheractivities performed the problem was not much pronounced but precautions need to be taken so that an MSD problem does not develop. The workers were suggested to keep trunk straight and not bend to unacceptable limits while doing cleaning job and take short pauses in between to break the monotonous and repetitive nature of work. The workers were also suggested to keep posture stable while usingequipment'sand use adjustable features of equipment's as provided.

It is interesting to note from the table 3. that almost in all the malls 80 − 100 % of the cleaners perform each activity at least 5 to 7 times per day per shift. In malls A, B and C some activities like cleaning full washroom areas especially wash basin and commode are performed 8 -10 times per day respectively. The reason could be the number of people coming to these malls and using washroom might be more than other malls. Further it can also be associated with the results of OWAS (table 2) that these activities i.e., wash basin, wall cleaning and commode cleaning activities needs immediate action. Hence it can be mentioned here that carrying out these activities for longer duration and in awkward posture needs to be addressed immediately to minimize the MSD problems of the workers. The workers need to involve in some exercises to relax the static loading from repetitive work to reduce the discomfort and pain.

Table 3: Frequency of Cleaning Different Areas in Washroom on Daily Basis.

Activity	Frequency of Cleaning	Mall A Frequency (%)	Mall B Frequency (%)	Mall C Frequency (%)	Mall D Frequency (%)	Mall E Frequency (%)
Washroom	2 to 4	0%	0%	0%	0%	0%
	5 to 7	10%	0%	100%	80%	50%
	8 to 10	**90%**	**100%**	0%	20%	50%
Wash Basin	2 to 4	0%	0%	20%	0%	0%
	5 to 7	20%	**80%**	50%	20%	50%
	8 to 10	**80%**	20%	30%	**80%**	50%
Floor Cleaning	2 to 4	0%	0%	20%	0%	20%
	5 to 7	**100%**	**80%**	60%	60%	60%
	8 to 10	0%	20%	20%	40%	0%
Wall Cleaning	2 to 4	0%	0%	0%	0%	0%
	5 to 7	**80%**	**100%**	20%	20%	**80%**
	8 to 10	20%	0%	**80%**	**80%**	0%
Commode Cleaning	2 to 4	0%	0%	0%	0%	0%
	5 to 7	**100%**	60%	20%	**80%**	60%
	8 to 10	0%	40%	**80%**	20%	40%
Mirror Cleaning	2 to 4	0%	0%	0%	0%	0%
	5 to 7	50%	**100%**	**80%**	**80%**	**80%**
	8 to 10	50%	0%	20%	0%	20%

To study the pain in different body part as perceived by the cleaners 5 – point Verbal Descriptor Scalewas used (Table 4). Body Map was used to identify the site of pain and intensity of pain was based on Verbal Pain Intensity Scale starting from 0 as no pain and 1 – 5 for mild pain to worst possible pain.

Table 4: Intensity of Pain Experienced by the Washroom Cleaners (n=30).

Site of Pain	5 Point Scale of Pain (Verbal Pain Intensity Scale)						Total Pain (from 1 - 5)
	No Pain (0)	Mild Pain (1)	Moderate Pain (2)	Severe Pain (3)	Very Severe Pain (4)	Worst Possible Pain (5)	
Neck	-	6 (20%)	3 (10%)	5 (16.7%)	16 (53.3%)	-	**30 (100%)**
Shoulder	-	-	1 (3.3%)	8 (26.7%)	**21 (70%)**	-	**30 (100%)**
Arm	28 (93.3%)	1 (3.3%)	1 (3.3%)	-	-	-	02 (6.7%)
Upper Back	-	-	4 (13.3%)	8 (26.7%)	18 (60%)	-	30 (100%)
Lower Back	-	-	-	1 (3.3%)	**29 (96.7%)**	-	**30 (100%)**
Wrists	6 (20%)	1 (3.3%)	-	-	**23 (76.7%)**	-	**24 (80%)**
Elbow	29 (96.7%)	1 (3.3%)	-	-	-	-	01 (3.3%)
Thigh	23 (76.7%)	7 (23.3%)	-	-	-	-	07 (23.3%)
Knee	-	-	**24 (80%)**	6 (20%)	-	-	**30 (100%)**
Calf	-	-	-	-	-	-	-
Feet / Ankle	23 (76.7%)	7 (23.3%)	-	-	-	-	07 (23.3%)

Source: [16, 17].

Note: Figures in parenthesis indicate percentages.

The respondents on general health enquiry reported to be overall in good health. But when asked in relation to their occupation they reported of having various bodily pains. Almost all the cleaners reported of having Neck, Shoulder, Knee, Upper and Lower Back pain ranging from mild pain to very severe pain. 96.7% and 76.7% reported of having very severe pain in Lower back and wrist respectively; followed by shoulder (70%), upper back (60%) and Neck pain (53.3%). Around 24% reported of having moderate pain in knee while 26.7% reported severe pain in upper back and shoulder.

The subjects werealso asked to rate the cleaning activities on 5 – Point RPE Scale [12]. The results of table 5 showed that 46.6% rated throwing away waste as heavy followed by (30%) cleaning commode and (23.3%) sink and platform cleaning. On overall rating of the job 53.3% cleaners rated job as very heavy, followed by 26.7% rating as heavy and 13.3% rated as Moderate.

Table 5: Rating of Perceived Exertion asExperienced by the Washroom Cleaners (n=30).

Malls	Very Heavy 5	Heavy 4	Moderate 3	Light 2	Very Light 1
Mall A (n=6)	2	2	1	1	0
Mall B (n=6)	3	2	1	0	0
Mall C (n=6)	4	1	1	0	0
Mall D (n=6)	2	2	1	1	0
Mall E (n=6)	5	1	0	0	0
Total (%)	16 53.33%	8 26.67%	4 13.33%	2 6.67%	0 0%

In a study on cleaners similar findings were reported with 49% suffering from low back, 41% having wrist and hands pain, 38% shoulder pain and 35% with neck pain [18] . Similarly in another study on cleaners higher levels of musculoskeletal pain and discomfort in lower back (46%), 42% shoulder pain, 39% wrist and hands, 33% neck and 24% knees were reported [19]. Similar findings concluding severe and very severe pain experienced in the lower back (62%), upper back (59%), upper arms or shoulders (54%) were also reported by other researchers. Severe pain was also reported in neck, hands and knees [20].

Overall the study revealed that the major risk factor for musculoskeletal disorder is the repetitive nature of job with activities requiring varied, unstable and awkward posture. The frequency of the activities performed was ranging between 5 – 7 times per day to some activities needing 8 – 10 times of cleaning. The results of OWAS showed that wash basin, commode and wall cleaning postures need immediate action. The results of pain revealed that almost all workers reported neck, shoulder, upper back, lower back and knee pain. Onthe pain scale lower back and wrist pain was rated as most severe. The washroom workers rated cleaning job to be very heavy and throwing waste, cleaning commode and platform and sink as heavy tasks to be performed.

4.   CONCLUSION

On the basis of results of the study it can be concluded that cleaning job is low paid, very laborious, monotonous, repetitive and with high risk of MSD. Immediate actions need to be taken for improvement of the workers' health and safety first. Reduction and minimization of postural risks and MSD problems is of prime concern. The major focus should be to have proactive approach of prevention rather than thinking for treatments to be given after injuries have developed. Training programs need to be organized for the workers to teach safe methods to perform activities and how to use equipment's provided for tasks to be performed keeping in mind the ergonomics principles of work. Exercise programs and warm up sessions before the start of the job should be introduced. A small guide to good work postures and safe way of performing tasks should be provided to each worker. Most importantly regular medical check up to know the occupational health problems must be mandatory and workers should be told to report any health issue related to work as and when it is observed.

REFERENCES

[1] EU-OSHA (European Agency for Safety and Health at Work). (2008). E-Facts 39- Cleaners and musculoskeletal disorders. https://osha.europa.eu/en/tools-and-publications/publications/e-facts/efact39

[2] Bernhardt A, Dresser L, Hatton E. (2003). The coffee pot wars: Unions and firm restructuring in the hotel industry. In: Appelbaum E, Bernhardt A, Murnane R J, editors. Low-wage America: How employers are reshaping opportunity in the workplace. New York: Russell SageFoundation, p 33–76.

[3] Messing K (1998). Hospital trash: Cleaners speak of their role in disease prevention. Medical Anthropology Quarterly 12(2):168–187

[4] Kalkis H,.Roja Z and Kalkis v. (2014). Physical load analysis in hotel cleaning work. Agronomy Research 12(3), 843–850.

[5] Gaucher D. (1981) L'e´galite´ salariale des femmes: Ebauched'uneproble´matique de la discrimination sexuelle et quelquesdonne´es. In C Bernier, R Bibeau, J Dony and P Doray (eds) Travailler au Que´bec (pp 183–197). Montre´al: Albert St-Martin

[6] Messing K, Hae¨ntjens C and Doniol-Show G (1993). L'invisiblene´cessaire: L'activite´ de nettoyage des toilettes sur les trains de voyageurs engare. Le Travail Humain (55):353–370

[7] Messing, K., Chatigny, C., and Courville, J. (1998). "Light" and "heavy" work in the housekeeping service of a hospital. Appl. Ergon. 29: 451-459.

[8] Milburn PD, Barrett RS. (1999). Lumbosacral loads in bedmaking. Appl Ergonomics 30:263–273.

[9] Torgen M, Nygard C H and Kilbom A (1995). Physical work load, physical capacity and strain among elderly female aides in home-care service. European Journal of Applied Physiology and Occupational Physiology 71(5):444–452.

[10] Karjalainen A, Martikainen R, Karjalainen J, Klaukka T and Kurppa K (2002). Excess incidence of asthma among Finnish cleaners employed in different industries. European Respiratory Journal 19(1):90–95

[11] Rosenman K D, et al. (2003). Cleaning products and work-related asthma. Journal of Occupational and Environmental Medicine 45(5):556–563

[12] Varghese M A., et al (1994). A Rapid Appraisal of Occupational Workload from a Modified Scale of Perceived Exertion. Ergonomics, Vol. 37, No. 3, 485-491.

[13] Karhu, O., Kansi, P., and Kuorinka, I. (1977). Correcting working postures in industry: a practical method for analysis. Applied Ergonomics, 8(4), 199-201.

[14] Abou-ElWafa HS, El-Bestar SF, El-Gilany A-H, et al. (2012). Musculoskeletal disorders among municipal solid waste collectors in Mansoura, Egypt: a cross sectional study. BMJ Open 2012;2:e001338. doi:10.1136/bmjopen-2012-001338.

[15] Nielsen J, (1992). Work environment and health among elderly cleaners - the economic benefits and the problem of age in the cleaning trade, Aging and Work Seminar, Finland N

[16] Moore A, Edwards J, Barden J et al (2003). Bandolier's Little Book of Pain. Oxford, Oxford University Press

[17] Breivik H, Borchgrevink PC, Allen SM et al (2008) Assessment of pain. Br J Anaesth 101(1): 17–24.

[18] Weigall F., Simpson K., Bell A.F., and Kemp l.(2005). An Assessment of Manual Tasks of Cleaners. Research online, University of Wollongong. WorkCover, NSW, Sydney, Australia.

[19] Woods, V., Buckle, P., Haisman, M., (1999). Musculoskeletal Health of Cleaners, HSE Books, Suffolk. Contract research report 215/1999.

[20] Krause N.(2002). Work-related Injury and Illness among Hotel Housekeepers.

[21] Buckle P, Devereux J. (2002). The nature of work-related neck and upper limb musculoskeletal disorders. Appl Ergon, 33:207–17.

[22] Devereux J, Rydstedt L, Kelly V, Weston P & Buckle P. (2004). The role of work stress and psychological factors in the development of musculoskeletal disorders - the stress and MSD study, Research Report 273, Robens Centre for Heatth Ergonomics, Health & Safety Executive, UK.

[23] Health and Safety Executive Book. (2003). Caring for Cleaners: Guidance and Case studies on how to prevent Musculoskeletal Disorders. ISBN0 7176 2682 2 HSE books, Sudbury Suffolk, UK.

[24] Messing, K. (2004). Physical exposures in work commonly done by women. Can. J. Appl. Physiol. 29(5): 639-656. © 2004 Canadian Society for Exercise Physiology.

[25] Rosenman K D, Gardiner J C, Wang J, Biddle J, Hogan A, Reilly MJ, Roberts K, Welch E. (2000).Why most workers with occupational repetitive trauma do not file for workers' compensation. J Occ Env Med 42:25–34.

[26] Kumar R and Kumar S. (2008) Musculoskeletal risk factors in cleaning occupation—A literature review.International Journal of Industrial Ergonomics.Volume 38, Issue 2, Pages 158–170.

[27] Seifert A M., and Messing k. (2006). Cleaning Up After Globalization: An Ergonomic Analysis of Work Activity of Hotel Cleaners. Blackwell publishing. USA.

[28] Singh L.P. (2010). Work Posture Assessment in Forging Industry: An Exploratory Study in India. International Journal of Advanced Engineering Technology, Vol.I / Issue III, pp.358-366.