FEMALE DOMESTIC WORKERS OCCUPATIONAL HEALTH IN CHIMUR TOWN AND CHANDRAPUR CITY, CENTRAL INDIA

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Background: The women population in India from the lower socioeconomic strata works as "domestic workers". They are required to carry out extensive household work, often for as long as 12-14 hours a day, with minimum wages. Activities they are involved with include vegetables cutting, cooking, washing clothes, sweeping, mopping the floor, etc. While doing so they are exposed to occupational health hazards. **Objective:** To objective of the study was to access the occupational health of female domestic workers from Chimur town and Chandrapur city in the Chandrapur district of Central India. **Method:** For the study, 50 domestic workers (25 each from Chimur and Chandrapur) were identified with varying exposure period. Purposive sampling was carried out to identify the study population. Occupational health was assessed based on Peak Expiratory Flow Rate (PEFR) analysis along with an interview schedule specially designed for the study. **Result:** Occupational health problems reported by these workers include musculoskeletal, dermatological, respiratory, gastrointestinal, and eyes. A dermatological problem like the peeling of the skin was common. Exposure to dust and extreme heat of sunlight was reported by all respondents. PERF values were found to be less than expected values. No personal protective equipment was used by these workers. **Conclusion:** Owing to the extended working hours, harsh working environment, exposure to dust and chemicals, not using personal protective equipment makes these workers' occupational health under threat.

Key Words: Chandrapur, Chimur, Domestic Worker, Occupational health.

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INTRODUCTION:

Domestic workers are unskilled, semiskilled, or untrained workers and various names are used to address them such as maid, bai, aii, kamwali, jhee, ayah, and dai. Their work is temporary and uses to do their job based on monthly wages. The time and working hours are not fixed, as their hours of working depending on the suitability of the house owners (Savita, 2019) [1]. The increasing demand for domestic workers in India has been associated with the growing middle class as more women from urban middle-class households are entering the workforce, household chores have been relegated to less privileged women (Svensson, 2018) [2].

These female domestic workers owing to their extended working hours, harsh working environmental conditions, and exposure to dust and chemicals have reported many occupational health hazards. Josephson *et al*., (2003) [3] in a case study of 20-59 years old Swedish women revealed hours of domestic work per week were 40 hours, which posed a risk of developing musculoskeletal disorders, neck pain, shoulder, and lower back pain. An increase in the risk of asthma and other respiratory symptoms in cleaning workers is reported by Medina-Ramon *et al.,* (2006) [4]. Frequent uses of bleach as well as other irritant cleaning products were associated with an increased risk of symptoms of asthma and chronic bronchitis.

Laxmidevi (2018) [5] reported back pain as a major problem in these workers. Cough & cold, fever, skin problems, and respiratory diseases were observed by Augustine and Singh (2016) [6]. The musculoskeletal disorder was identified as the most important health problem by Rosano *et al*., (2004) [7]. Mukhopadhyay *et al*., (2003) [8] reported neck pain, back pain, and ankles/feet pain. Non-communicable diseases and other common diseases were identified by Hall *et al*., (2018) [9]. Fever, skin diseases, fracture, and asthma in domestic workers was reported by Siddeqa *et al*., (2018) [10]. Digestion system problems due to lack

of food and irregular eating hours, gastric problems, and diarrhea were reported by Wong (2010) [11].

The female domestic workers are neglected social elements in Indian society. At several times they are not respectably treated and have to face verbal abuse. The significant difference between urban and rural living standards in India set up the varying working environmental conditions for these domestic workers. Print and online literature review revealed that no study was carried out on the occupational health of female domestic workers from the rural set up of India. Thus, this is the identified gap in this subject domain. This study was carried out to assess the occupational health of female domestic workers in the Chimur town and Chandrapur city of Maharashtra state of central India. This study outcome will add a new understanding of occupational health problems of these workers in a rural lifestyle where technological advancement is still a distinct feature. Furthermore, the initiatives to be taken at national/state-level policy formulation and mechanism for the implementation of the same can be taken to reduce their exploitation verbally, socially, and economically and provide them a respectable job level and dignity of life.

Study Area:

Chandrapur city is a municipal corporation in Chandrapur district. It is situated at 19.57° North latitude and 78.18° East longitude and has an area of about 70.02 sq km. Chandrapur has a hot and dry climate. December is the coldest month, with a minimum average temperature of 9°C and a maximum average temperature of 23.2°C. May is the hottest month with a mean maximum temperature of 46°C and a mean minimum temperature of 28.2°C. The average annual rainfall is 1249.4 mm and the average number of rainy days is 59. As per the Census of India 2011, the population of the city was 3,20,379.

Chimur is a town in Chimur administrative block, in the Chandrapur district. It is situated at 20.29° North latitude and 79.22° East longitude. Its climate is characterized by a wide climatic condition that ranges from warm summer May temperature up to 36°C to cold winter December temperature 20°C and dryness throughout the year. Tropical climate precipitation is average 1443 mm. The population of the town as per the Census of India 2011 was 1,69,547.

MATERIAL AND METHODS:

To carry out the objective of the study, 25 domestic workers each were selected systematically from Chandrapur city and Chimur town. For identifying the sample population purposive sampling was adopted. Emphasis was laid on selecting varied exposure duration exposure to ascertain impacts of this occupation on their health. To compare the results obtained from the sample population a control population of five workers was identified as those who were doing routine household activities.

To assess occupational health, two methodologies were adopted viz. interview schedule through a specially designed questionnaire and Peak Expiratory Flow Rate (PEFR) analysis to assess lung capacity. The questionnaire was specially designed and validated by a pilot study. The questionnaire comprises of personal information, occupational exposure duration, and identification of occupational health problems, and use of personal protective equipment. The interviews were conducted during the respondent's working time, at home, or in their leisure time.

The PEFR is a measure of how well air can move out of the lungs. Breathe-o-meter (Cipla, India) was used to test PEFR (in L/min). When a person blows out through a breathe-o-meter, it measures the speed at which air is pushed out of the lungs. In people with asthma, the PEFR reading is reduced as their airways are narrowed. The breathe-o-meter is a simple and easy way to use a device to assess the health of an individual's airway. It measures the peak expiratory flow rate of individuals. When the individual blow into the mouthpiece of the instrument the pointer moves forward and the reading will be taken to check the lung capacity. It measures the airflow through the bronchi and the degree of obstruction in the airways. The PEFR value obtained was compared with the control group. Statistical analysis was carried out for the generated PEFR values for minimum, maximum, spread, standard deviation (SD), and variance. Furthermore, an attempt was carried out to correlate age and observed PEFR values.

RESULTS:

The 50 domestic workers identified for the study, were in the age group of 20-60 years. The demographic profile, education, daily working hours, and occupational health problems were assessed. Table 1 presents the demographic characteristics of the sample population.

Table 1: Demographic characteristics of female domestic workers

Characteristic	Respondent		
	Chandrapur	Chimur	Total
Gender			
Female	25 (50%)	25 (50%)	50 (100%)
Age group			
20-30	7 (28%)	4 (16%)	11 (22%)
31-40	4 (16%)	19 (76%)	23 (46%)
41-50	9 (36%)	Nil (00%)	9 (18%)
51-60	5 (20%)	2 (8%)	7 (14%)
Education			
Illiterate	3(12%)	5(20%)	8 (16%)
Literate	22(88%)	20(80%)	42 (84%)

Work profile:

Fifty respondents selected for the study were engage in the domestic work occupation. They were engaged in this occupation for several years. The working duration of these workers was of seven to eight hours per day. They start their work early morning at 8 am or 9 am and works till the evening at 5 pm or 6 pm. The domestic workers walk more than 3 km a day to complete their work and all the domestic workers were self-employed. They have been involved in household chores activities viz. cleaning utensils, washing clothes, cooking, sweeping, and floor mopping. They even work on Sundays and holidays.

Occupational health problems:

Occupational health problems reported after completion of the work include musculoskeletal, respiratory, dermatological, gastrointestinal and eyes are presented in Table 2.

Of the various occupational health problems reported by these workers, musculoskeletal problems have emerged as a major one followed by respiratory, dermatological, gastrointestinal, and eyes. It was found that 92% respondents had shoulder trouble, 80% upper back pain and knee pain, 78% lower back pain, 74% hand pain whereas neck trouble, thigh pain, and finger pain were reported by 68%.

Table 2: Occupational health problems after completion of the work

Occupational health problem	Respondent (n=50)	
	Number	Percentage
Musculoskeletal		
Shoulder trouble	46	92%
Upper back pain	40	80%
Knee pain	40	80%
Lower back pain	39	78%
Hand pain	37	74%
Thigh pain	34	68%
Neck trouble	34	68%
Finger pain	34	68%
Respiratory		
Respiratory problems	40	80%
Chest tightness	30	60%
Fatigue	10	20%
Blood pressure	10	20%
Allergic problem	5	10%
Dermatological		
Palm skin dry, thick, scaly	25	50%
Peeling skin	16	32%
Deep painful cracks on feet	3	6%
Gastrointestinal		
Cough & cold	12	24%
Fever	12	24%
Stomach pain	8	16%
Vomiting	3	6%
Diarrhoea	1	2%
Typhoid	1	2%
Malaria	1	2%
Eyes		
Eyes problems	20	40%

Respiratory problems were reported by 80% (n=40) respondent, 30 (60%) had chest tightness, whereas fatigue and blood pressure was reported by 10 (20%) each. Allergy symptoms were sneezing, itching of the nose, irritation of the eyes. The allergic problem was reported by 5 (10%) workers.

Of the sample population, 50% reported palm skin dry, thick, scaly and 32% peeling of the skin, and 6% deep painful cracks on feet (Figure 1). A total of 24% workers reported cough & cold and fever, whereas 16% had stomach pain, 6% vomiting, and

2% malaria, typhoid, and diarrhoea each. Eyes problems were reported by 20 (40%) respondents.


Figure 1: Peeling skin problem

Women's health:

The domestic workers were interviewed particularly for menstrual cycle, health care, pregnancy, etc. Of the selected domestic workers, 20 (40%) do not go for their work during menstruation. The women use readymade pads and clothes as a menstrual pad. Stomach pain during menstruation was reported by 10 (20%) respondents; whereas, 4% (n=2) reported complications during pregnancy and delivery. During pregnancy, these workers do not go to work.

Personal protective equipment:

It was observed that domestic workers do not use any personal protective equipment while carrying out domestic work. Neither this equipment is provided by their employer nor do they ask for the same.

Peak Expiratory Flow Rate analysis:

The PEFR analysis was carried out to check the lung capacity of domestic workers. Results obtained for the PEFR test (L/min) are presented in Table 3. The results are classified based on the age group.

From the results, it is observed that domestic workers have lower PEFR values than the expected values. It is further observed that the PEFR value decreases with the increase in the age of the worker. These observations highlight that, these workers owing to their exposure to house dust, chemicals used for mopping the floor, and other occupational conditions may have reduced their lung capacity and may be suffering from asthma.

Table 3: PEFR values according to the age group

Age group			
20-30		31-40	
Expected value	Observed value	Expected value	Observed value
428	400	383	380
390	300	300	290
461	450	314	300
439	430	352	350
352	350	383	380
393	390	380	370
390	360	300	290
393	390	300	290
330	320	388	380
356	350	314	300
393	300	394	350
		381	370
		383	380
		300	290
		321	300
		324	320
		343	340
		394	350
		383	380
		300	290
		383	380
		324	320
		295	300
n=11			n=23

Age group			
41-50		51-60	
Expected value	Observed value	Expected value	Observed value
288	250	294	250
321	300	300	290
295	280	212	200
312	300	295	230
294	250	291	200
294	270	294	250
330	300	200	213
293	290		
293	290		
n=9			n=7

In the case of the control group observed PEFR values were near to the expected values (Table 4). Thus, it can be said that the lung capacity of the control group is well, and they do not suffer from any lung disorder.

Table 4: PEFR values for the control group

Expected value	Observed value
309	300
294	270
322	320
311	300
294	254
n = 5	

The statistical summary of PEFR observations for respondents is presented in Table 5. From the table, it can be seen that the maximum and minimum values of each age group are different. The value of the standard deviation (SD) decreases as the age group increases. The age group of 20-30 years had a maximum standard deviation as well as variance and in the age group of 51-60 years, the minimum. Thus, it can be stated that as the age group increases PEFR value decreases.

Table 5: Statistical summary of PEFR observations

	Age group			
	20-30 (n=11)	31-40 (n=23)	41-50 (n=9)	51-60 (n=7)
	PEFR (L/Min)			
Minimum	300	290	250	200
Maximum	450	380	300	290
Spread	150	90	50	90
SD(±)	49.81	37.40	20.27	32.69
Variance	2481.81	1398.89	4111.1	1068.9

SD: Standard Deviation

Correlation to analyze the relationship between the age group and the PEFR value of domestic workers is presented in Table 6. The correlation was calculated by first calculating each age group's average and then observed PEFR values average. From the observations, it can be stated that as the age group increases the PEFR value gets reduced or decreases. Age and PEFR are strongly negatively correlated (r = -0.992). This shows that the work environment harms the lung capacity of female domestic workers.

Table 6: Correlation between age and observed PEFR value

Age group	Age average	Observed PEFR value average	Correlation
20-30	27.81	367.27	0.036
31-40	36.34	334.78	0.017
41-50	43.66	281.11	-0.116
51-60	55.71	233.28	-0.034
Overall correlation -0.992			

DISCUSSION:

As pointed out by Theodore *et al.,* (2018) [12] housecleaners are at risk through long-term exposure to the chemicals that are found in the everyday household as cleaning products. The housecleaner reported suffering from skin irritation and had a trouble breathing problem. These observations compare well with the results obtained in this study. Furthermore, Siddeqa *et al.,* (2018) [10] also attributed various skin irritants and rashes symptoms when continuous use of soaps and detergents and contact with house dust and dirt, also suffered asthma.

Anjara *et al.,* (2017) [13] reported female domestic workers' skin changes are affected due to the passage of time, due to exposure to the sun. A common skin problem is the thickness of skin, itching, and irritation. Housemaids suffering from skin problems because of wet work i.e. frequent exposure of hands to water this corroborates with the observations obtained from the study area.

Wong (2010) [11] reported the majority of the domestic workers had body pain, numbness, cramps in legs, pain in shoulder and arms also lack of sleep which is also observed from the study area.

Medina-Ramon *et al.,* (2006) [4] reported the short term effects of intermittent cleaning exposure on respiratory symptoms and Peak Expiratory Flow (PEF) with obstructive lung diseases. These results follow the results obtained from this study.

Training should be provided to these workers for maintaining proper posture and standard operating procedures to be followed while carrying out these activities may to a greater extent reduce musculoskeletal disorders. Rather than moving water-filled buckets, tubs, etc. use a flexible pipe to fill the same. Use of long handle broom should be encouraged. The traditional floor mopping (by seating position) method can be modified by using a floor mopping stick. Chemicals, soaps, and other cleaning agents used in this occupation need to be made eco-friendly with less use of harmful chemicals. While using chemicals, phenyls, and bleach for mopping the floor face mask should be

used to avoid exposure to the harmful fumes releasing from them. The traditional grass/plant origin broom to be replaced with plastic one which will minimise the dust release. Rather than using a dry method for dusting a wet method involving the use of water needs to be encouraged. As dust will get adsorbed on the duster (cleaning cloth) this will avoid re-suspension of dust and its entry into the respiratory system. Wearing sleepers while at work, drying the feet and palm after work along with applying any oil/moisturizing to them at night will reduce to a certain extent the dermatological problems. Plastic hand and feet gloves use will ensure the minimum contact with water. During winter, the use of warm water for doing household activities will minimise to a certain extent cough & cold and fever. Regular eating hours and drinking of water should be followed thus acidity, vomiting, and other problems can be controlled.

CONCLUSIONS:

The female domestic workers have occupational health problems by engaging in this occupation. The number of occupational health problems increases as the exposure duration to this occupation increases. Of the occupational health problems, the musculoskeletal has emerged as the major one. PEFR values were reduced due to exposure to dust and chemicals and exposure duration. Not using personal protective equipment augmented occupational health problems.

These workers need to be made aware of the occupational health problems of this work. Moreover, preventive and corrective measures to reduce exposure needs to be provided. These workers need to be brought under a government scheme to get facilities of insurance, medical, and others. The regular medical check-up will help to early detection of any occupational health disorder. Use of personal protective equipment needs to be encouraged. A weekly off can help to rejuvenate to some extent the health conditions of these workers and thus to reduce occupational health problems to some extent.

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Conflict of Interest : None