

Assessment of postural deviation of selected women while mopping floor in squatting and standing posture

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■ **ABSTRACT :** The study entitled assessment of postural deviation of selected women while mopping floor in squatting and standing posture was conducted in Parbhani city of Marathwada region in Maharashtra state. Thirty women aged between 25-35 years involved in mopping activity was selected purposively to determine the postural deviation of selected women while mopping the floor in squatting and standing posture. It was found that the body of selected women was deviating more at cervical, lumbar and elbow joint while mopping in squatting posture. Statistically 't' values showed a significant difference between angle of deviation at cervical, lumbar and elbow joint while mopping in squatting and standing posture. Statistically age of women in I group (25 – 30 yrs.) was highly significant with angle of postural deviation at cervical joint (0.53**) while mopping in standing posture and significantly correlated with angle of postural deviation at elbow joint (0.38*). Second group of weight (40 – 50 kg) of women was negatively highly significant with angle of deviation at cervical joint (- 0.52**) while mopping in standing posture. Negatively highly significant correlation was found in I group of height (135 – 145 cm) of women and angle of postural deviation at cervical and lumbar joint (- 0.65** and - 0.55**) while mopping in squatting posture. For II group (146 - 155 cm) of height negative significant correlation was observed with cervical joint (- 0.42*). Women in the III group (156 – 165 cm) of height showed highly significant correlation with cervical joint (0.54**) and significant correlation with lumbar joint (0.42*) while mopping in squatting and standing posture. Women in the III group (156 – 165 cm) of height showed negatively highly significant correlation with angle of postural deviation at cervical joint (- 0.58**) while mopping in squatting posture and significant correlation with angle of postural deviation at lumbar joint (0.42*) while mopping in standing posture.

■ **KEY WORDS:** Postural deviation, Mopping floor, Squatting and standing posture

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Many of cleaning tasks involve heavy manual work and are physically demanding. There is a high cardiovascular and musculoskeletal

load in many cleaning tasks (Hagner and Hagberg, 1989; Kruger *et al.*, 1997 and Kumar *et al.*, 2005). Many aspects of work and environment are not conducive to

good health. Therefore, these factors increase the risk of occupational diseases (*i.e.*, musculoskeletal disorders). Among these factors are poor working postures e.g. reaching and stooping, lack of task variation, poor ergonomic work and workplace, poor design of cleaning tools and the task including work organization such as long working hours, low salaries and uncomfortable working times.

Among all cleaning activities carried out at domestic level maintenance of floor is one of the hardest tasks because always some dirt is brought from outside and more is produced from food spillage, lint, hair or fur and dust. Mopping of the floors consists of cleaning dust and dirt from the floor surface using a wet absorbent material carrying a bucketful of water to rinse the soiled duster.

Although a lot of improvements and modernization has been introduced in domestic operations there is a need of increased awareness for more incorporation. The improved mop with long handle have been designed with mechanized squeezing system to carry out the mopping activity in a standing posture with less bending at back. The main objective is to improve efficiency, productivity and increased satisfaction of the worker without jeopardizing his/her health. Hence the present study was undertaken with the following objectives to determine the postural deviation of selected women while mopping the floor in squatting and standing posture and to find out correlation of age, weight and height, of women with postural deviation while mopping the floor in squatting and standing posture.

■ RESEARCH METHODS

The study was conducted in Parbhani city of Marathwada region in Maharashtra state. Thirty women aged between 25-35 years involved in mopping activity was selected purposively. The selected subjects were healthy and without any physical deformities and illness.

For assessment of postural deviation in squatting posture traditional cloth mop was selected and for standing posture long handle mop with basket was used. (A Basket having pedal at the base and revolving squeezer inside the basket. Mop have round base having wicks and handle to hold).

Similar type of polished mosaic tiled flooring, covering a fixed area of 10 x 12 feet was selected to carry out the experiment in the residences for mopping

the floor in squatting and standing posture.

The survey was conducted with the help of prepared questionnaire to find out detailed information of the women through personal interview method.

Goniometer was used for measuring the postural angle at lumbar, cervical and elbow region. Postural analysis of the respondents at lumbar region, cervical region and elbow region was carried out by calculating angle of deviation while performing mopping activity.

't' test was used for assessing the differences in variables. Correlation co-efficient was assessed to find out the association between the variables.

■ RESEARCH FINDINGS AND DISCUSSION

Majority 53.3 per cent of the women were in the age group of 31-35 years while 46.6 per cent of the women were in the age group of 25-30 years. With reference to the family type it was found that 66.6 per cent of the women belonged to nuclear family while only 33.3 per cent of the women were from joint family. Regarding the family size it was found that 53.3 per cent of the women were having 2-4 members in the family while 33.3 per cent and 13.3 per cent of the women were having 5-6 and above 6 members in the family, respectively.

Monthly income of the family it was observed that 86.6 per cent income of women was ranging between Rs. 10000-15000/- While 10 and 3.3 per cent of selected women were in the income group ranging between Rs. 15000-20000/- and Rs. 20000/- and above, respectively. Majority 43.3 per cent of selected women were secondary school educated followed by high school (30%) and college (26.6%). Majority of the women were engaged in household activities (70%) while 30 per cent women were engaged in small scale enterprises.

Regarding body weight of selected women shows that 46.6 per cent and 53.3 per cent of the women were having body weight ranging between 40-50 kg and 51-60 kg, respectively. In the context of body height majority of the women were in the height range of 146-155 cm followed by 135-145 cm (23.3%) and 156-165 cm (20%), respectively.

Angle of postural deviation of body of the women while mopping the floor in squatting and standing posture is shown in Table 1. It is evident from the table that at cervical joint, the mean angle of postural deviation of women while mopping in squatting posture was 8.76°

ranged from 6⁰-15⁰. While it was minimum for mopping floor in standing posture *i.e.* 3.63⁰ ranged from 2⁰- 5⁰.

At lumbar joint the mean angle of postural deviation of women while mopping in squatting posture was 12.33⁰ ranged from 8 to 20⁰. The mean angle of postural deviation of women at lumbar joint while mopping in standing posture was 3.83⁰ ranged from 2 to 6⁰ which was minimum as compared to squatting posture.

In case of elbow joint the mean angle of postural deviation was 7.56⁰ ranged between 5 to 10⁰ while mopping floor in squatting posture. The mean angle of postural deviation of women at elbow joint while mopping floor in standing posture was 4.5⁰ ranged from 3 to 7⁰.

Calculation of ‘t’ values showed a highly significant difference between angle of postural deviation at cervical, lumbar and elbow joint while mopping floor in squatting and standing posture. The results of the study are in line with study conducted by Sawant (2012) in which the results showed reduction in postural angle at lumbar, cervical and elbow joint when the washing cloth was carried out in improved method.

Table 2 indicate correlation of age, weight and height of women with postural deviation while mopping the floor in squatting and standing posture.

Age :

It is evident from the table that the mean age of the I group (25-30 yrs) was 27.07 yrs and mean age of II group (31-35 yrs) was 34 yrs. Correlation coefficient test revealed that I age group (25-30 yrs) of the selected women was highly significantly correlated with angle of postural deviation at cervical joint (0.53**) while mopping in standing posture and also showed a significant correlation with angle of postural deviation at elbow joint (0.38*) while mopping floor in squatting posture.

Weight :

The mean weight of the I group (40-50 kg) was 48.07 kg and mean weight of the II group (51-60 kg) was 55 kg. Weight of selected women was correlated with postural deviation while mopping the floor in squatting and standing posture. There was a negative highly significant correlation between I group of weight (40-50 kg) with mopping floor in standing posture (- 0.52**). It was found that as the weight of women increases their angle of deviation at cervical joint decreases while mopping floor in standing position.

Height :

The mean height of the I group (135-145 cm), II

Table 1 : Angle of postural deviation of women while mopping the floor in squatting and standing posture

Posture	Postural deviation(⁰) at cervical joint			Postural deviation (⁰) at lumbar joint			Postural deviation (⁰) at elbow joint			
	Mop	Range	Average	't' value	Range	Average	't' value	Range	Average	't' value
Squatting (Cloth mop)		6 – 15	8.76 ± 2.84	9.5 **	8 – 20	12.33 ± 3.46	13.07**	5 - 10	7.56 ± 1.65	9**
Standing (Basket mop)		2 – 5	3.63 ± 1.03		2 – 6	3.83 ± 1.08		3 - 7	4.5 ± 1.008	

Table 2 : Correlation of age, weight and height, of women with postural deviation while mopping the floor in squatting and standing posture

Personal variables	Mean	Postural deviation (⁰) at cervical joint		Postural deviation (⁰) at Lumbar joint		Postural deviation (⁰) at Elbow joint	
		Squatting 'r' Value	Standing 'r' Value	Squatting 'r' Value	Standing 'r' Value	Squatting 'r' Value	Standing 'r' Value
Age							
25 - 30	27.07 ± 2.20	0.08 ^{NS}	0.53**	-0.06 ^{NS}	0.08 ^{NS}	0.38*	0.26 ^{NS}
31 - 35	34 ± 1.50	0.12 ^{NS}	0.128 ^{NS}	-0.07 ^{NS}	-0.27 ^{NS}	0.32 ^{NS}	-0.11 ^{NS}
Weight							
40 - 50	48.07 ± 2.94	0.25 ^{NS}	-0.52**	0.16 ^{NS}	-0.19 ^{NS}	-0.25 ^{NS}	-0.18 ^{NS}
51 – 60	55 ± 2.96	0.13 ^{NS}	0.06 ^{NS}	-0.28 ^{NS}	0.26 ^{NS}	0.33 ^{NS}	0.16 ^{NS}
Height							
135 - 145	142.28 ± 1.97	-0.65**	-0.33 ^{NS}	-0.55**	0.27 ^{NS}	0.07 ^{NS}	0.18 ^{NS}
146 - 155	149.82 ± 2.69	- 0.42*	-0.02 ^{NS}	0.32 ^{NS}	-0.03 ^{NS}	-0.30 ^{NS}	-0.24 ^{NS}
156 – 165	161.33 ± 1.96	0.54**	-0.58**	0.42*	-0.36*	-0.20 ^{NS}	-0.31 ^{NS}

NS=Non-significant, * and ** indicate significance of values at P=0.05 and 0.01, respectively

group (146-155 cm) and III group (156-165 cm) were 142.28 cm, 149.82 cm and 161.33 cm, respectively. It is clearly seen from the table that women in I group of height (135-145 cm) showed negative highly significant correlation with angle of postural deviation at cervical (-0.65**) and lumbar joint (-0.55**) while mopping in squatting posture. The women in the II group of height (146-155 cm) showed negatively significant correlation with angle of postural deviation at cervical joint (-0.42*) while mopping in squatting posture. It was found that as the height of women increases their angle of deviation at cervical joint and lumbar joint decreases while mopping floor in squatting posture.

While women in the II group of height (156 – 165 cm) showed highly significant correlation with angle of postural deviation at cervical joint (0.54**), and significant correlation with lumbar joint (0.42*) while mopping in squatting posture. A negatively highly significant correlation was observed with angle of postural deviation at cervical joint (-0.58**), and negative significant correlation at lumbar joint (-0.36*) while mopping in standing posture. Indicated that as the height of selected women increased the angle of deviation at cervical and lumbar joint decreased.

Conclusion :

It can be concluded that majority of women were in the age group 31-35 years, belonging to nuclear families with 2-4 family members and earning monthly income Rs. 10000 – 15000/-, having body weight ranging between 51-60 kg and range of body height 146-155 cm

The body of selected women was deviating more at cervical, lumbar and elbow joint while mopping in squatting posture. Statistically 't' values showed a significant difference between angle of deviation at cervical, lumbar and elbow joint while mopping in squatting and standing posture.

Statistically age of women in I group (25 – 30 yrs.) was highly significant with angle of postural deviation

at cervical joint (0.53**) while mopping in standing posture and significantly correlated with angle of postural deviation at elbow joint (0.38*).

Second group of weight (40-50 kg) of women was negatively highly significant with angle of deviation at cervical joint (-0.52**) while mopping in standing posture.

Negatively highly significant correlation was found in I group of height (135-145 cm) of women and angle of postural deviation at cervical and lumbar joint (-0.65** and -0.55**) while mopping in squatting posture. For II group (146 - 155 cm) of height negative significant correlation was observed with cervical joint (-0.42*). Women in the III group (156 – 165 cm) of height showed highly significant correlation with cervical joint (0.54**) and significant correlation with lumbar joint (0.42*) while mopping in squatting and standing posture. Women in the III group (156 – 165 cm) of height showed negatively highly significant correlation with angle of postural deviation at cervical joint (-0.58**) while mopping in squatting posture and significant correlation with angle of postural deviation at lumbar joint (0.42*) while mopping in standing posture.

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