Himachal Journal of Agricultural Research 43(1): 54-59 (2017)

Postural analysis of women involved in the spice packing activity

Neena Vyas, Aruna Rana, Seema Sundhu and Madhu Dadwal
Department of Family Resource Management, College of Home Science
CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur-176 062, India.
Corresponding author: neena_vyas@yahoo.co.in

Received: 20.06.2017; Accepted:28.07.2017

Abstract

In spice industry, women workers spend time in performing different activities. Women generally work under number of strains like inefficient tools, awkward posture and poor environmental conditions that not only affect their work efficiency but also their health adversely. The present study "Postural Analysis of Women Involved in the Spice Packing Activity" was undertaken to find out the health status of women workers involved in spices industry and to measure the ergonomic cost of work in the spice packing activity. Random sampling technique was used in selecting 60 women involved in spice industry. RULA (Rapid Upper Limb Assessment) posture analysis sheet was used to access working posture. The results revealed that maximum number (37) of respondents always used the sitting posture while performing the packing activity. Majority of the respondents sometimes spent more than 3 hours while performing the packing activity. Majority of the respondents reported the problem of itching in neck, swelling in feet and stiffness in wrist. The results of RULA analysis depicted the high risk in the working posture while packing the spices.

Key words: Posture, musculo skeletal disorders, spices, grip strength.

India is the land of spices. At present, the country produces two million tonnes of different varieties of spices and hold first position in the world (Prabhavathi *et al.* 2013). Human resources are the biggest asset of many countries and play a significant role in the industrial development. In spice industry women workers spend time in performing different activities in various awkward positions which lead to different musculo-skeletal disorders. These activities being static as well as repetitive may give rise to fixed body position, continued repetition of movements and concentrated force on hand or wrist without significant recovery between the movements (Velga *et al.* 2012). In spices industry a large number of women are employed in packing activities and are facing so many health problems. They generally work under number of strains, poor environmental conditions and use inefficient tools that not only affect their work efficiency but also their health adversely.

Various Indian spices are reported to possess antimicrobial as well as medicinal properties. Spices are used in several forms; fresh or dried, whole or crushed, ground or powdered. Using dried spices entails advantages such as easy handling, longer shelf life and higher taste intensity compared to fresh ones. However, the aroma of dried spices is less than fresh, and the fiavours can be oxidized resulting in losses during milling, storage and packing operations (Matthews *et al.* 2011). Women have to work harder and their efficiency cannot be achieved mainly because work places are not ideally designed. Hence, to obtain maximum efficiency in work with least cost there should be an ideal relationship between work, worker and workplace. Space that people require depends upon the elbow room needed for their job and for their psychological satisfaction. Hanspal (1985) indicated in her study that elbow height increases with an increased change in body posture. Mittal (1981) reported that energy expenditure was higher at ground level while stitching clothes as compared to sitting on chair.

The man-machine relationship has to be very close for better work efficiency, maximum body comforts and good health of the worker. Ergonomic

cost of work may vary due to the differences in the type of machines, equipment and furniture design used for work, environmental factors vis-à-vis relative humidity, light intensity, noise and temperature etc. Thus, keeping the above facts in mind, the present study was undertaken to study the ergonomic cost of women's work involved in spice packing activity with the objectives to determine the health status of women involved in packing industry and to measure the ergonomic cost of women's work involved in the spice packing activity.

Methodology

Locale: The present study was conducted in two blocks of Kangra district of Himachal Pradesh i.e. Panchrukhi and Nagrota Bagwan blocks, where women were involved in packing of spices.

Selection of sample: Random sampling technique was used to select a sample of 60 women respondents in the age group of 20-60 years involved in spice packing activity.

Data collection tool: Interview-cum-Observation sheet

Parameters studied: The interview schedule included questions cum observation facts regarding the physiological parameters of the respondents in existing working conditions as well as the kind of work postures adopted and their musculoskeletal problems while carrying out the spice packing activity.

Data Analysis: Data were compared at 5 per cent level of significance. Simple averages, percentages and mean scores were also used to analyze data collected through survey method. Analysis of results pertaining to laboratory experiments were done by using paired "t" test.

Results and Discussion

The most important aspect to success in any venture is education. Figure 1 indicates that a very small percentage i.e. 3.33 per cent of the respondents were educated up to higher secondary, whereas maximum 43.33 per cent of the respondents were educated upto primary level followed by 18.33 per cent of respondents who were illiterate. Figure 2 shows that majority of the women (46.66 %) were in the age group of 56-60 years as compared to 1.66 percent women who were below 30 years of age. Figure 3 shows the years of working experience of the women in the spice factory. Majority of the percentage (60 %) were having an experience of 10-20 years. Troup and Chapman (1969) reported that body weight has a direct bearing on the metabolic rate of person while performing manual work. Heavier person would have a greater metabolic rate and concomitant circulatory load, which could lead to earlier fatigue or cardiovascular problems. On the other hand a heavier person is usually stronger than his lighter counterpart and usually has the mass necessary to counter balance the handling of the large object.

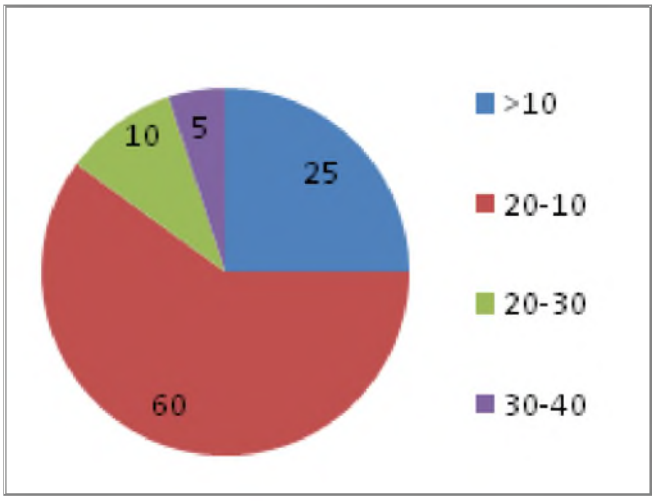

Figure 1. Education qualification of the respondents

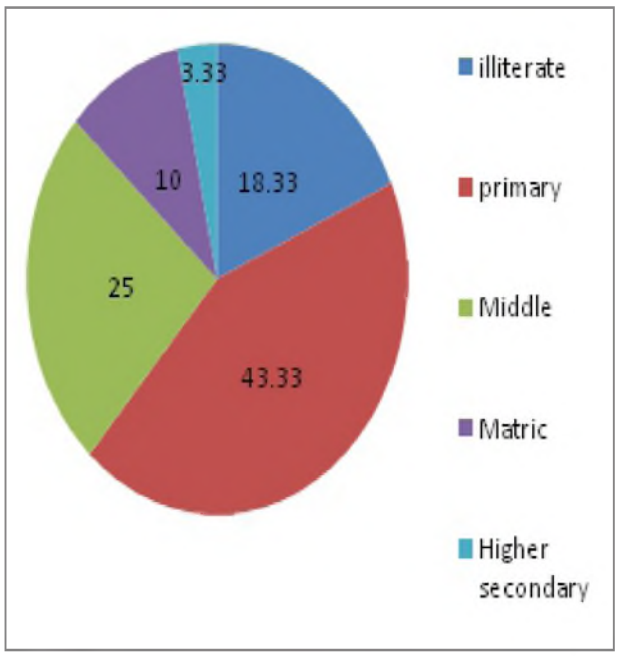

Figure 2. Average age of the respondents

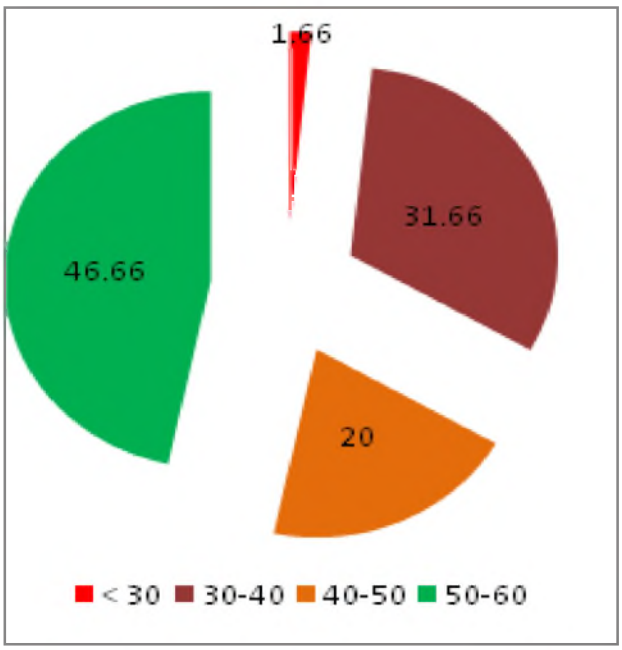

Figure 3. Working experience of the respondents (years)

Data in Table 1 indicate that the majority of respondents i.e. 61.66 per cent always sat on the floor while packing the spices followed by 25 per cent of respondents who sometimes adopted the kneeling posture. The data further elicits that 13.33 per cent of respondents preferred squatting posture for the given activity. Puri (1992) did a study on physiological cost of grinding spices and concluded that sitting on *phiri* caused less fatigue as it consumed less energy as compared to grinding when squatting on ground, standing at counter level or sitting on *patra.*

Data in Table 2 indicate that cent per cent of respondents performed cleaning and drying on alternatives days whereas packing was done daily. It is also clear from the table that the posture while performing these activities that is cleaning, drying and packing was changed between 0 to 2 times. On the basis of the observations and respondent's responses, the light in the room was found insufficient while carrying out the cleaning and packing activity, so the respondents' eyes were much fatigued by the end of the day.

Cardiovascular responses measured by working heart rate in existing conditions have been depicted in Table 3. It can be seen that mean heart rate before activity was 81.01 beats/min. and was lower than the heart rate recorded while carrying out the activity which was 88.95 beats / min.. Murali *et al.* (2007) also found that the working heart rate was significantly higher than resting heart rate of the selected household and farm activities. The highest energy expenditure was observed while collecting firewood (9.9 kJ/min) and lowest energy expenditure was recorded while preparing food (7.7 kJ/min.). Thus, increase in heart rate during activity was observed. The reason may be the continuous sitting posture leading to fatigued muscles, twisted trunk and repetitive motion of hands causing occupational stress. Pheasant (1991) conducted research on ergonomics work and health and stated that heart rate is better index for overall physiological demand of work than energy expenditure. According to him, for continuous work women heart rate should not be more than 35 beats/min higher than at resting level. The results of the present study reveal that the physiological cost of packing activity was within the permissible limits.

It is observed from Table 4, that mean blood pressure before activity was lower than that during the activity. Thus, there was an increase in the blood pressure during activity.

Table 1. Distribution of the respondents according to posture adopted during packing activity **n=60**

Posture	Always	Sometime
Stooping	-	-
Squatting	-	8(13.33)
Kneeling	-	15(25.0)
Floor Sitting	37(61.66)	-

*Figure in parenthesis indicate percentage of respondents: *Multiple responses

Table 2. Distribution of the respondents according to Performance Interval, Postural Change and Room Light **n=60**

Activity	Performance Interval		Postural Change		Room Light	
	Alternate days	Daily	0-2 times	More than 2 times	Sufficient	Insufficient
Cleaning	60(100)	-	60(100)	-	-	60(100)
Drying	60(100)	-	60(100)	-	-	-
Packing	-	60(100)	60(100)	-	-	60(100)

*Figure in parenthesis indicate percentage of respondents

Table 3. Distribution of the respondents according to average heart rate while performing the packing activity **n=60**

Heart rate (beats/min.)	Before Activity	During Activity
Mean	81.01	88.95
STD.DEV	± 20.92	± 29.10
Difference		7.9
STD. Error of Difference		4.6
T		1.71*

*significant at 5% level