



PERFORMANCE OF DHANLAXMI SERRATED SICKLE FOR REDUCING DRUDGERY OF FARM WOMEN WORKER IN PADDY HARVESTING

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Abstract:

In Vidarbha region traditionally paddy is harvested manually by using sickle. Mainly harvesting is done by women worker only. Harvesting is one of the tedious and back breaking tasks in paddy cultivation. In view of problem Krishi Vigyan Kendra, Chandrapur and Gadchiroli introduced Dhanlaxmi serrated sickle developed by Panjabrao Deshmukh Agriculture University for paddy harvesting to farm women. However to test the performance of serrated sickle in drudgery reduction during paddy harvesting fifteen number of farm women workers in the age group of 20-40 years were selected. Both the sickles local and serrated compared among same selected farm women workers. The mean values of age, weight, height were measured to be 30.9 years, 40.9 kgs., and 154.3 cm respectively. It was observed that the mean values of increase in heart rate over rest (Δ HR) were 24.5 beats/min and 32.6 beats /min for serrated and local sickle resp. The mean values of area harvested per hour were 136.6 m² and 158.2 m² for serrated and local sickle respectively. The corresponding increase in heart beats per m² of area harvested was 11.3 and 13.9. It indicates from data that the differences in mean values of Δ HR and increase in heart beats per m² of area harvested, 18.7% drudgery reduced by use of Dhanlaxmi serrated sickle as compared to local sickle.

Keywords- Serrated sickle, drudgery reduction, farm women worker, heart rate

Introduction:

In India, women the important segment of farming community alone performs more than 70 per cent of on farm activities. However the nature and extent of their involvement differs with the variation in agri-production systems which can range from being managers to landless labourers. In overall farm production, women's average contribution is estimated to range from 55% to 66% of the total labour with percentage much higher in certain regions (Anilkumar Singh 2012). Even within the region, their involvement varies widely among different ecological sub-zones, farming systems, castes, classes and stages in the family cycle. In some field operations like sowing, inter cultivation and harvesting, women remain numerically predominant compared to men. Among the agricultural operation farm women share 84 per cent of harvesting activity including reaping, winnowing, drying, cleaning and storage (Chaudhry 2009). In paddy cultivation women play crucial role throughout the country from transplanting to harvesting and post-harvest operations. Almost 70 per cent of transplanting and its associated activities are performed by women. (Karunanithi and Tajuddin, 2003).

The farm women put in hard physical labour beyond their capacity. In relation to drudgery faced by women in different farm activities based upon opinion of farm women it has been reported that maximum drudgery

perceived by the respondent were in rice transplanting and harvesting (Sirohi, 1996 & Singh et al, 2006). Harvesting is identified as one of the most drudgery prone tasks on calculated drudgery index (34) (Oberoi & Singh, 2001). Harvesting is generally done either in squatting or bending posture and workload involved is quite high. The workers also get injured during operation due to abrasion/cut on finger/toes due to sickle. National center for women in agriculture (NRCWA) reported 26.5% health hazards faced by farm women due to harvesting activity in Orissa.

Women performed most drudgery prone task in agriculture with the same traditional implements developed ages ago causes considerable drudgery and in turn affects the health of rural women. The plight of the farm women in this regard is alarming as they are constraining by illiteracy, poor health, unemployment, low technical knowhow and skills. Drudgery of farm women in various field operations could be reduced by providing improved tools and equipment. (S. P. Singh 2009). Improved sickle is basically made up of good quality steel for cutting and has serrated edge. It is expected that this type of sickle would require less effort for cutting and would reduce drudgery in harvesting operation. Improved sickle was more suitable for crop harvesting by farm women and their preference was shown towards improved sickle as compared to the

sickle traditionally used by them. (Reeta Mishra & U. P. Singh 2012). The productivity of farmers using serrated sickles is higher than that of farmers using non serrated sickles. (D. Sutjann, 2000). Use of improved serrated sickle by the farm women is desirable for cutting of fodder & cereal crops due to fact that reduces drudgery and saves the time and money. Hence such improved technology need to be demonstrated on large scale among rural farm women (H. S. Patel, B. Singh, 2013). One of the ways to substantially reduce drudgery is to make women aware of latest drudgery reducing technologies and motivate them to adopt the same (Maya choudhry 2009).

In view of above concluded studies the present study was carried out to create awareness among farm women and to motivate them for adoption of Dhanlaxmi serrated sickle for paddy harvesting by experimental learning to know how Dhanlaxmi sickle contribute towards their drudgery reduction.

Materials and Method:

Performance of Dhanlaxmi serrated sickle developed by Dr. Panjabrao Deshmukh Agriculture University, Akola was compared with local sickle of Sindewahi region for reduction in drudgery during harvesting of paddy crop. The important specifications of sickles are shown in Table 1.

Fifteen number of farm women workers involved in paddy cultivation operations were selected to harvest the paddy variety PKV HMT. Selected subjects were of normal health falling between the age group of 20-40 years. Physical characteristics age, weight and height of all subjects were recorded and their mean values measured were 30.9 years, 40.9 kgs, and 154.3 cms respectively. Trials were conducted at Krishi Vigyan Kendra Sindewahi farm in the month of December 2011-12. Subjects were given practice of operation of Dhanlaxmi sickle for 2 days. Each trial was of 30 minutes duration. Between the two trials 15 minutes rest was given to subject. Three replications were done for each treatment. Data on resting and working heart rate were recorded by using available instrument stethoscope. Data on area

harvested also recorded and per cent reduction in drudgery were calculated.

Result and discussion:

The Table 2 depicts data on heart rate responses of farm women during harvesting. It can be seen that during harvesting with Dhanlaxmi serrated sickle the average working heart rate was 119.6beats/min and average Δ HR was 24.5 beats /min recorded lower values than local sickle as 123. 4 beats/min, 32.6 beats /min. The corresponding values for increase in heart rate for area harvested were 11.3 beats/m² for serrated sickle while 13.9 beats/m² for local sickle. Data indicates that there is 18.7% reduction in drudgery by use of Dhanlaxmi serrated sickle. The findings of the study are in conformity with (Gite & Agrawal 2000) reported Δ HR 27beats/min and 11.1beats/m² heart rate increase for area harvested. Drudgery reduced 16.5%by use of serrated sickle. (S.P. Sing2012) also reported lower work pulse values (19&20) by vaibhav and Navin serrated sickle than local sickle value (21) and reduction in drudgery during harvesting of paddy (Alka singh, et.al 2014) reveals average working heart rate was110beats/min and 19.5% of working efficiency is increased by using serrated sickle.

Energy expenditure on activity performed by Dhanlaxmi and local sickle was 10kJ/min and 11kJ/min. The workload of a worker in operation of Dhanlaxmi serrated sickle was of moderate category. While operation of local sickle was of heavy category as per the classification of workload given by Varghese et.al.(1994). Whereas regarding work out put it is seen that mean values of area harvested was 136.5 m²/h by Dhanlaxmi sickle which was lower than local sickle 156.3 m²/h which might be due to basic differences in operation of sickles and women was not habituated with operation of serrated sickle. Reliability of the findings supported by Gite & Agrawal (2000) and S.P. Sing (2012) found area harvested by improved serrated sickle was lower than local sickles as local sickle used by workers since childhood but there was no significant difference in work output.

Table 1: Specification of local and Dhanlaxmi sickle

S. No.	Particular	Sindewahi sickle	Dhanlaxmi sickle
1	Weight	262 gm.	200gm
2	Length of sickle	325 mm	345mm
3.	Length of handle (wooden)	114mm	140mm
4	Diameter of handle	33mm	30mm
5.	Material used for blade	Mild steel	High carbon steel
6.	Type of edge	Plain	Serrated
7.	Operation of sickle	Stem cut by pulling force	Stem cut by sawing action

Table 2: Mean ergonomical parameters of farm women workers during harvesting of paddy crop. (N=15)

Ergonomical parameters	Local sickle	Dhanlaxmi serrated sickle
HR (rest) beats/min	90.9	90.0
HR (work) beats/min	123.4	119.6
Δ HR beats/min	32.6	24.5
Increase in HR beats/m ²	13.9	11.3
Work output m ² /h	158.2	136.6
Energy expenditure kJ/min	11	10

Conclusion:

Dhanlaxmi and local sickle were compared for reduction in drudgery during harvesting of paddy. It was seen that by use of Dhanlaxmi serrated sickle there was 18.7% reduction in drudgery. The physiological workload of farm women was categorized as moderate work. Low output obtained which might be due to basic differences in operation of sickles and women were not habituated with operation of serrated sickle. Output can be higher by repeated use and practice with serrated sickle.

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