Progressive Research – An International Journal
Volume 15 (2) : 106-108 (2020)
Print ISSN : 0973-6417, Online ISSN : 2454-6003

Society for Scientific Development in Agriculture and Technology
Meerut (U.P.) INDIA

ERGONOMIC EVALUATION OF FARM WOMEN DURING MAIZE HARVESTING BY IMPROVED SICKLE AT PANCHMAHAL DISTRICT OF GUJARAT

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ABSTRACT

The study was carried out at village Dudhwa and Bhadroli, under the adopted cluster area of KVK, Panchmahal (Gujarat), in *Kharif* season (2010–2011, 2011–2012) to determine the physical fitness, time and activity profile and physiological stress of Farm women at the time of harvesting of maize activity. Use of improved serrated sickle was compared to traditional sickle was tested on farm women to improve work efficiency and to reduce the drudgery of women. A technically prepared serrated sickle was tasted on 45 farm women to improve work efficiency and reduce the drudgery of women. The data of improved and local sickle were compared. The results revealed that 18.5% of work efficiency increased by using serrated sickle as an average, the workload was under acceptable limit for day- long work with normal rest pause for studied sickles.

Key words *: Drudgery, ergonomic evaluation, improved sickle.*

Agriculture is an unorganized sector where majority of the women labour is engaged either in their own field and other field, activities like weeding, cutting, uprooting, Picking/doffing, transplanting removal of stalk and stubble, threshing was found to be maximum drudgery involved agriculture activities performed by women. Drudgery is generally conceived as physical and mental strain, agony, monotony and hardship experienced by farm women while performing these farm operations.

The women play a significant and crucial role in agricultural development and allied field including livestock production, horticulture, post harvest operations etc. is a fact taken for granted but ignored. The nature and extent of women's involvement in agriculture varies greatly from region to region. Even within the region. Also their involvement varies widely among different ecological sub -zones, farming system, castes, classes etc. but regardless of these variations, there is hardly any activities in agricultural production in which women are not actively involved.

The general trend existing in rural India is limited resources available to women because of low socio-economic status in the society and within that limited access to resources, there exists a strong disparity that, most of the women's earning goes towards nutritional security of the households. Most women cannot invest in the technology. Introduction to new technology in agricultural operation adopted by farm women leading to mechanization will reduce to drudgery and improve the efficiency. About 78 percent of economically active women are engaged in agriculture compared to 63 percent of men. Almost 50 percent of rural women are classified as agricultural laborer and 37 percent as cultivators. In such condition where participation of women in agriculture is as high as 95 per cent, the women need to have the précised agricultural tools and implements.

METERIALS AND METHODS

The study was carried out with 45 farmwomen among normal health without any major illness involved in crop harvesting activity, each falling between the age group of 25 to 45 years. The field experiment was conducted in the month of March to May 2014-2016 for crop harvesting and bundling activity. A uniform time of 6 hours was given for the crop harvesting activity by theoretically equipped serrated sickle and traditionally made local sickle and 1.5hour in bundling activity per day headed for farm women.

During the experiment, the anthropometric rod and weighing balance were used to measure the physical Characteristics like height and weight. Stop watch was used for recording time. The heart rate was recorded by using the heart rate monitor. Based on the heart rate records the following parameters were calculated :

Average heart rate during rest and work.

The energy expenditure was estimated from the heart rate (1).

Energy expenditure (kj/s) = 0.159 Average heart rate (beats/min) – 8.72.

HR (beats/min) = Average working heart rate-average heart rate during rest.

Output (m^2/h) = area covered duration/average time.

Cardiac cost of worker per unit of out (beats/m^2 area covered) = HR duration part

Table-1 : Physical characteristic of selected respondents. (N=30)

S. No.	Physical characteristic	Mean	S.D.
1.	Age	30.33	+9.82
2.	Height	155.50	+1.52
3.	Weight	48.50	+2.47

Table-2 : Farm women Opinion on the use of simple sickle and improved sickle for maize harvesting.

Factor assessed	Maximum Attainable score	Attainable score		Per cent attained score over Maximum		Remark	
		Simple sickle	Improved sickle	Simple sickle	Improved sickle	Simple sickle	Improved sickle
Stress factor	10	5	9	50.0	90	Acceptable	Highly acceptable
Work out put	10	6	9	60.0	90		
Tool factor	15	11	14	73.33	93.33		
Field acceptability	15	10	13	66.66	86.66		
Over all	50	32	45	64	90		

Table-3 : Evaluation of performance data of different parameter of farm women while crop harvesting. (N=45)

Particular	Mean	S.D.
Type of implements used	Local sickle	Serrated sickle
Time (hrs.)	6	6
Number of bundle harvested	28 + 2.50	39 + 3.00
Average working heart rate (beats/mean)	103 + 3.99	111 + 5.57
Average heart rate during rest (beats/mean)	81 + 3.55	87 + 3.80
HR (beats/mean)	23 + 3.87	25.50 + 3.52
Area covered/output (m^2/h)	71 + 3.92	88 + 3.92
Energy expenditure (kj/s)	10.90 + 0.57	13 + 2.29
Cardiac cost (beats/m^2)	19 + 3.81	16.50 + 2.40
Reduction in drudgery (%)	-	18.00
Increase in efficiency (%)	-	18.50

RESULTS AND DISCUSSION

To evaluate the harvesting through ergonomic point of view, 45 respondent were selected in the age group of 25 to 45 years were selected at random and average age of the respondent engaged in crop harvesting operation was conducted 30.33 years measuring body height of 155.50 cm and weight as 48.50 kg, respectively (Table-1).

The opinion of farm women on the use of simple and improved sickle for harvesting of crop is presented in table-2. The percentage of attained Score for simple sickle was found to be 64% while in case of improved sickle, it was 90 per cent. Thus rate of perceived opinion for improved sickle fall in the category of highly acceptable tool as compared to simple sickle.

Table-3 depicts that 18.50%of working efficiency increased by using serrated sickle as one farm women harvested and bundled an average of 39 bundles each by using serrated sickle while only 28 bundles each of was harvested and bundled through local sickle in given time frame of 6 h for harvesting activity. Physiological stress revealed that output recorded by serrated sickle was 88 m^2 /h as compared to local sickle by which 71 m^2/h areas harvested. (2) also stated that improved sickle resulted in higher field capacity than simple sickle because of less pushing force required operating the sickle, which resulted in higher cutting speed and also found increased output with better harvesting efficiency and reduced drudgery by using serrated sickle.

CONCLUSIONS

Serrated sickle is women friendly tool because the assessment of technology increases the efficiency and reduces drudgery and it avoids bending and squatting posture. Serrated sickle provides safety to the workers due to its better construction and reduces musculoskeletal disorders. It is necessary to maintain proper posture during performing these types of activities. Serrated sickle saves about 18% cardiac cost of worker per unit of output over traditional practices. It does not require sharpening of cutting edges frequently.

This is a kind of women empowerment. It lessens the exertion and fatigue. Women feel comfortable; they earn money by reducing the labour. Their social life increases and they feel empowered in society. Hence, there is need to initiate women oriented researches in agriculture. As discussed earlier women have a different agronomical characteristic than men, design of women friendly tools

and equipment is required. Work station should be adjustable to make it comfortable for women during performing agricultural activities.

REFERENCES

1. Varghese M.A., Saha P.N. and Atreya N. (1994) A rapid appraisal of occupational workload from modified scale of perceived exertion. *Erogonomics 37(3):* 485-491.
2. Mishra R., Singh Y.P., Mishra Y.D., Singh S. and Singh H. (2013). Dissemination of improved Sickles for female agriculture workers for crop harvesting. *Technofame 2(1):* 118-123.
3. Singh A., Gutam U.S., Singh R. and Paliwal D. (2014) Ergonomic study of farm women during wheat harvesting by improved sickle. *Afr. J. Agric. Res.,*1386-1390.
4. Singh S.P. (2012).Physiological worked of farm women while evaluating sickle for paddy harvesting, *Agric. Eng. Int. CIGR J. 14(1):* 82-88.
5. Singh S. and Arora R. (2010) Ergonomic intervention for preventing musculoskeletal disorders among farm women. *J. Agri. Sci, 1(2):* 61-71.

Received : February-2020 Revised : February-2020 Accepted : March-2020