Assessing the occupational health hazards in paddy cultivation practices in the coastal region of Andhra Pradesh

ABSTRACT

India is one of the largest producers of rice and ranks second in the world in production All the cultivation practices in paddy are done manually by the farm labour due to various reasons such as lack of money, small land holding size, lack of awareness on improved tools, high operational cost of machinery, etc… Cultivation practices involved so much drudgery which ultimately reducing the efficiency and productivity of work. Drudgery is usually regarded as physical and psychological strain, fatigue and monotony, and hardship experienced by humans. To assess the work-related health hazards, the present study was planned in the East and West Godavari districts of Andhra Pradesh. 60 females and 60 males constitute the present study based on the specific practices done by the males and females. A modified Nordic questionnaire was prepared to assess the work-related health hazards and assigned mean ranks by using appropriate statistical tools. Results found that in land preparation pain in the body (2.87), in irrigation tingling/ numbness in hand got the highest weighted mean (2.17), in manure and fertilizer application pain in the body (2.58), in pesticidal spray irritation in eyes/blurred vision (2.82), in threshing pain in the body (2.77), in load carrying pain in the body (2.82) has got the highest weighted mean which were the male- specific activities. Whereas in uprooting tingling/numbness in hand (2.83), in transplanting tingling/numbness in hand (2.97), in weeding and harvesting tingling/numbness in hand (3.00), in winnowing tingling/numbness in hand (2.37) have got highest weighted mean which were the female-specific activities. If they continue to work manually, they may face serious health problems which finally affect various factors such as the efficiency of work, productivity of work, the standard of living, healthy life, etc…So, it was suggested that they could go for the improved tools that are easily available and can reduce the drudgery to some extent.

Keywords: Health hazards, Drudgery, work efficiency, productivity of work.

I. Introduction

India is one of the largest producers of rice and ranks second in the world in production. it is the staple food for the major part of Asia and the rest of the world population. Almost all cultivation practices in paddy were doing manually by the farmers. Drudgery is usually

regarded as physical and psychological strain, fatigue and monotony, and hardship experienced by humans. In doing all the practices, they are adopting awkward postures as well as highly repetitive movements which results in physical strain. As a result, the productivity of the work and efficiency of the worker are greatly reducing. By working in awkward postures during a particular agricultural activity rice farmers suffer from pain in different parts of their body, especially in the lower back, knee, ankle, feet, and shoulder regions (Das and Gangopadhyay, 2011). Gangopadhyay *et.al*., 2010 also suggested that working in a squatting and awkward posture for a prolonged period may lead to musculoskeletal disorders especially low back pain among the different groups of workers. In rice cultivation, Manual rice transplanting is a high labor-demanding operation and is directly associated with human drudgery. Bhushan *et.al.,* 2016 found in their study that most of the respondents were using traditional tools and implements for a long time. These traditional tools and implements cause many health hazards among women due to a lack of knowledge and information, as they take body-related pain as a normal part of work. Generally, Indian women feel more work for a long time without rest and perform many roles in society and family. This drudgery or fatigue results in feeling tired, sleepiness, physical or mental stress, exhaustion, and pain in body parts. So, it is often said that each one of the farm women suffers from drudgery while performing various activities. Reported that women working in agriculture usually have to make do with archaic tools or a lack of proper tools at all which can also be unsafe, hazardous, and unhealthy was reported by Tripathi *et.al.,* 2021.

Chakraborty *et.al.,* (2022) conducted a study to find out the present status and awareness of 120 farm women about drudgery reduction technologies in Rajgarh district, Madhya Pradesh. Findings revealed that most of the farm women were of middle age and illiterate. The trend of nuclear type of families existed which were of medium size. Most of the farm women belonged to the OBC category having annual family income of less than Rs 1,00,000 as the majority were marginal farmers with small size of herds. Very few of them (10.00 percent) had complete Pucca houses. Maximum participation of farm women was found in animal dung collection and its disposal (90.50 percent) followed by picking of vegetables (88.50 percent), storage (85.00 percent), manual harvesting (82.00 percent), weeding (80.00 percent) and drying and cleaning of grains (80.00 percent). Among all the activities, manual harvesting was considered a drudgery-prone operation/difficult-to-perform activity by 66 percent of respondents followed by weeding (63.00 percent), threshing (60.00 percent), picking of vegetables (44.00 percent) and thinning (43.00 percent). The majority (82.50 percent) of

farm women had a low level of awareness about drudgery-reducing tools and implements. Choobineh *et.al.,* (2007) observed that Rice cultivation is associated with Gender disparities and the occurrence of musculoskeletal disorders among rice farmers by recognizing the wide range of ergonomic risk factors. As per the current study, most of the respondents that are 99 percent face the problem of pain in different regions of the body, including the low back (93.8 percent), shoulder (60.9 percent), hand (53.6 percent), and knee (80.9 percent), as a result of abnormal posture (99 percent) and excessive repetitive job (95 percent) over the period. twin groups of rice farmers experienced the most difficulty during operations such as excavating (87.7 percent), planting seeds (82.7 percent), hauling crops (99 percent), and harvesting (90.9 percent). Farmers were also exposed to extreme physiological and temperature stress, which ceased their capability to carry out their other daily activities.

II. Material and methods

a. Data Description:

The locale of the present study was the coastal region of Andhra Pradesh in which we have selected two districts namely East Godavari and West Godavari. 60 samples who were in the age group between 20-40 years were selected from each district which constitutes 30 male farmers and 30 female farmers respectively. Thus, the total sample size constitutes to 120. The sample has been selected in such a way that the population should have BMI (Body Mass Index), CC(Calf-Circumference), MUAC (Mid-upper Arm Circumference), and percent body fat values in the normal range. This is because to get the physically fit sample for credible results.

Table 1. Parameters, their measurement, and normal range of values

S.No	Parameters	Definition	Normal range	Measured tool
1	BMI (Body Mass Index)	It is an approximate measure of whether someone is over- or underweight, calculated by dividing their weight in kilograms by the square of their height in meters.	18.5 to 24.9 for both males and females.	Measuring tape and weighing machine
2	CC (Calf Circumference)	It was measured as the maximum horizontal	26.0cm to 29.9cm for males	Measuring tape

		distance around the left calf as the subject stood upright.	25.0 to 28.3 cm for females.	
3	MUAC (Mid-upper Arm Circumference)	MUAC was measured at the midway point between the olecranon process of the ulna and the acromion process of the scapula.	22.9cm to 25.6cm for males 22.8 to 25.4 cm for females.	Measuring tape
4	Percent body fat	It was estimated with the help of biceps measurement, triceps measurement, Subscapular measurement, and Supra-iliac measurements of a body.	8 to 19 percent for males 21 to 32 percent for females.	Skin fold callipers

b. Occupational Health Hazards:

Various occupational health hazards have been noticed among the farmers separately among the men and women in the paddy cultivation practices in which men are doing Land preparation, Irrigation, Manure, fertilizer application, Pesticidal spray, Threshing, and Load carrying activities and women are doing Uprooting, Transplanting, Weeding, Winnowing, and Harvesting. During the interview, the responses of farmers were taken into consideration. The participants were interviewed about any kind of health hazards affecting different body parts during every activity associated with paddy cultivation. The frequency and percentage of occupational health hazards faced by the farmers have been assessed. Weighted mean and ranks were assigned appropriately.

Table. 2 Frequency and scores for the occupational health hazards

Frequency	Score
Frequently	**3**
Sometimes	**2**
Rare	**1**

Never	**0**

III. Results

a. Physiological parameters:

Table. 3 Values of various physiological parameters

S.No	Parameter	Mean value	Standard Deviation
1	BMI (Body Mass Index)	24.5 (M&F)	+ 2.5/-2.5 (M&F)
2	CC (Calf-Circumference)	28.2cm (M) 26.95cm (F)	+2.9/-2.9 (M) +2.85/-2.85 (F)
3	MUAC (Mid Upper Arm Circumference)	24.65cm (M) 23.75cm (F)	+3.15/-3.15 (M) +2.95/-2.95 (F)
4	Percent Body Fat (Biceps, Triceps, Subscapular, and supra iliac measurements)	13% (M) 23.5% (F)	+3.0/-3.0 (M) +1.5/-1.5 (F)

***M= Male and F= Female**

The above table mentioned that all the physiological parameter values for the respondents found to be in the normal range which indicated that they are fit for doing the cultivation practices.

b. work related health hazards

Table.4 showing the weighted mean and ranks for different health hazards in male-dominated activities in paddy cultivation (N=60)

Activities	Land preparation		Irrigation		Manure and fertilizer application	
	WM	Rank	WM	Rank	WM	Rank
Skin irritation and Allergy	1.32	VIII	0.15	VII	2.22	IV
Irritation in eyes/ blurred vision	1.20	IX	0.00	VIII	2.03	VIII
Poisoning	0.00		0.00	VIII	2.20	V
Cut/ wounds and bruises injuries	2.53	IV	0.73	VI	0.27	XI

Breathing problems and congestion	2.43	V	0.00	VIII	1.62	X
Pain in the body, fatigue	**2.87**	**I**	1.48	IV	**2.58**	**I**
Tingling / Numbness in hand	2.72	II	**2.17**	**I**	2.48	II
Biting of insects	1.53	VII	2.00	II	2.10	VII
Slip, Trip, and Fall	2.22	VI	1.13	V	1.78	IX
Chemical Hazards	0.00	X	0.00	VIII	2.47	III
Dehydration and Heat Stress	2.57	III	1.63	II	2.18	VI

WM= weighted mean

contd….

Activities	Pesticidal spray		Threshing		Load carrying	
	WM	Rank	WM	Rank	WM	Rank
Skin irritation and Allergy	2.48	III	2.18	IV	0.00	V
Irritation in eyes/ blurred vision	**2.82**	**I**	2.25	III	0.00	V
Poisoning	2.47	IV	0.00	IX	0.00	V
Cut/ wounds and bruises injuries	0.85	X	0.00	IX	0.00	V
Breathing problems and congestion	2.55	II	1.98	V	0.00	V
Pain in the body, fatigue	2.55	II	**2.77**	**I**	**2.82**	**I**
Tingling / Numbness in hand	2.43	VI	2.58	II	2.75	II
Biting of insects	1.60	IX	1.17	VII	0.00	V
Slip, Trip, and Fall	1.83	VIII	0.08	VIII	1.55	IV
Chemical Hazards	2.45	V	0.00	IX	0.00	V

Dehydration and Heat Stress	1.95	VII	1.95	VI	1.87	III

WM= weighted mean

The above table clearly mentioned that in Land preparation pain in the body, fatigue have got the highest weighted mean; in Irrigation tingling or numbness in hand; In Manure and Fertiliser application pain in body, fatigue; In Pesticidal spray irritation in eyes/ blurred vision; In Threshing pain in the body, fatigue; In Load carrying pain in the body, fatigue have got the highest weighted mean respectively.

Table.5 showing the weighted mean and ranks for different health hazards in female-dominated activities in paddy cultivation (N=60)

Activities	Uprooting		Transplanting		Weeding	
	WM	Rank	WM	Rank	WM	Rank
Skin irritation and Allergy	0.55	VI	2.32	IV	2.33	IV
Irritation in eyes/ blurred vision	0.00	VII	0.00	VIII	0.00	VIII
Poisoning	0.00	VII	0.00	VIII	0.00	VIII
Cut/ wounds and bruises injuries	1.73	V	1.77	V	1.88	VII
Breathing problems and congestion	0.00	VII	0.00	VIII	0.00	VIII
Pain in the body, fatigue	2.48	III	2.87	II	2.85	II
Tingling / Numbness in hand	**2.83**	**I**	**2.97**	**I**	**3.00**	**I**
Biting of insects	2.23	IV	1.67	VI	1.95	V
Slip, Trip, and Fall	2.23	IV	1.35	VII	1.92	VI
Chemical Hazards	0.00	VII	0.00	VIII	0.00	VIII
Dehydration and Heat Stress	2.55	II	2.45	III	2.55	III

WM= weighted mean ***contd…***

Activities	Harvesting	Winnowing

	WM	Rank	WM	Rank
Skin irritation and Allergy	2.20	V	0.00	VII
Irritation in eyes/ blurred vision	1.52	VII	2.35	II
Poisoning	0.00	IX	0.00	VII
Cut/ wounds and bruises injuries	2.55	III	0.00	VII
Breathing problems and congestion	0.00	IX	2.12	III
Pain in the body, fatigue	2.88	II	1.62	V
Tingling / Numbness in hand	**3.00**	**I**	**2.37**	**I**
Biting of insects	2.37	IV	0.00	VII
Slip, Trip, and Fall	0.17	VIII	1.60	VI
Chemical Hazards	0.00	IX	0.00	VII
Dehydration and Heat Stress	1.98	VI	1.88	IV

WM= weighted mean

The above table clearly mentioned that in all the female specific activities, viz, Uprooting, Transplanting, Weeding, Harvesting, and Winnowing Tingling/ Numbness in the hand have got the highest weighted mean.

IV. Conclusion

All the cultivation practices in paddy were doing manually which results in the various occupational/ work related health hazards. Due to these hazards productivity and efficiency of workers is greatly reducing which ultimately resulting in the low standard of living, malnutrition, decreased access to the credit, etc. If the scientists or extension personnels from KVKs, State departments officials can arrange some mass campaigns regarding the work-related health hazards to make aware of the disadvantages of manual practices, it can be useful for the farmers to adopt the improved tools available for the paddy cultivation.

V. References

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