



Front line demonstrations on cotton made protective garments- A safety measure for farm women

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ABSTRACT : Cotton picking is a tedious job with considerable drudgery exclusively handled by women. Fatehabad of Haryana is a predominantly cotton growing district. Women in the region face severe health hazards due to cotton picking. In cotton picking, women faced problems of pain in shoulder and hands and experience a lot of fatigue. Drudgery reducing technology for specific operations for the farm women engaged in cotton picking was a felt need of the region. Body part discomfort analysis in agricultural operations by farm women, indicated that maximum discomfort score was found in right palm followed by lower back (3.44) and neck (3.42). Minimum discomfort was found in left elbow (1.14) and right elbow (1.58). It is concluded from the results that in cotton picking, farm women face very severe to moderate discomfort in some of the body parts like right palm, left palm, neck and right shoulder. To minimize body discomfort, there is a need to provide them ergonomic intervention in the form of protective gloves, picking bag and capron while picking cotton. Due to intervention earning of the beneficiaries was increased by 44 per cent in cotton picking.

Key words : Discomfort score, efficacy, ergonomic, front line demonstrations, protective garments

Agriculture continues to be an important component of Indian economy. Though its share in national output has declined, it still contributes around 14 per cent to national GDP and provides employment to around 52 per cent of the work force. However, several challenges of Indian agriculture are causes of concern of different stakeholders of this sector.

It has been observed that women are less likely to be involved in more mechanized and capital intensive farm geared to market oriented production. Women lack technological knowledge and have limited access to skills in the use of new techniques, lack of official support and information results in their developing rigid attitude. They are responsible for more labour intensive work that requires pain staking

physical effort, patience and perseverance. Thus, women use their hands or simple tools to broadcast seeds and fertilizers, hand weed and harvest, pick fruits and vegetable manually and carry produce on their back.

Agriculture work is not free from hazards of various types of gravity, farm workers face numerous occupational and health hazards. In case of women these get appreciated mainly due to prevalence of malnutrition, anemia, frequent child birth, long work hours, and poor postures. Problems related to environment like worker work in open all through the day in hot sun, dust, cold and rain. This apart from other effects causes them to sweat, eye irritation, allergies, breath lessness and body ache.

Most of works performed by farm women

are tedious, tiring as well as time consuming. They cause fatigue and drudgery. All these factors results in physical and mental fatigue. Ergonomic, risk factors are found in jobs requiring repetitive forceful or prolonged exertions of the hands, frequent or heavy lifting (Kirkhom, 2010). Women workers face severe health hazards in picking, in terms of cuts and wounds in hands, hardness of skin, blisters and abrasions. Moreover, skin allergies due to chemical sprays were commonly an acute problem to 30 per cent for the pickers. They were using their own devised methods for protecting themselves against these hazards (Bal *et al.*, 2013). Keeping in mind front line demonstrations were conducted for technology transfer to mitigate health hazards by ergonomic intervention in cotton picking.

Locale of study: The present study was conducted in Fatehabad district of Haryana state. Out of six blocks, four blocks namely Bhattu, Bhuna, Ratia and Fatehabad were selected purposively as major cotton growing blocks. From each block two villages were selected randomly by covering 100 rural women who attended vocational training on protective garments.

Dissemination of interventions: The recommended and specifically designed protective garments developed by CCS HAU, Hisar were demonstrated by KVK Fatehabad in selected villages. The pick bag made of cotton fabric and designed as per the anthropometric measurements of women is used for picking and collecting cotton. Shaped pockets are provided in the front and below the waist line, which makes it user friendly. Cushioned belts avoid strain on shoulder, hand and neck. It thus reduces the drudgery while picking the cotton. Cotton picking bag, protective gloves, capron and masks were the protective tools promoted by the KVK through various activities listed below.

Out of 600 beneficiaries of vocational training, 100 rural women were selected for further analysis after using the recommended technologies in peak season of cotton picking as per intervention provided for use of recommended tools. The respondents were asked to use conventional methods for one month and evaluation was done on two parameters *i.e.* cotton collection capacity and safety and comfort in picking cotton. For 2nd month they were provided intervention kit and evaluation was done accordingly. Body posture discomfort score was calculated on five points

Table 1. Activities carried out by KVK, Fatehabad on cotton made protective garments

Programme/activities	Number	Beneficiaries
Field Days	04	400
Labour day celebration	04	380
Frontline demonstration	100	2000
Organization of Exhibitions and Kisan melas	2	800
Farmers scientists- Interaction programmes	4	800
Vocational trainings on garment construction	20	600

continues by providing scores to each category *i.e.* Severe Discomfort (4); Discomfort (3); Somewhat discomfort (2); Least discomfort (1) and No discomfort (0). Perceived feasibility of ergonomic intervention was worked out on five attributes. In present context, the feasibility has been defined as the extent to which farm women have perceived the technology in terms of different attributes namely relative advantage, physical and cultural compatibility, simplicity, complexity and practicability. The attributes, thus, selected were quantified in terms of respondents perception regarding technologies.

As per the perusal of Table 2 it was found that 72 per cent respondents reported strain on shoulder by using conventional bag. However it was reduced to 5 per cent by using recommended intervention. 67 per cent respondents faced problem in hand while using conventional bag which reduced to 12 per cent with recommended cotton picking bag. Regarding working efficiency related parameters, it is evident from data that majority of the farm women *i.e.* 70 per cent take more than one h in picking one loading (one *Jholi*) in conventional bag followed by 10 per cent in less than ½ h, whereas in cotton picking bag which is designed as per anthropometric

measurements 60 per cent respondents take less than half h in picking one load. This trend showed that cotton picking bag provided during intervention programme helped them to collect more cotton as compared to conventional bag. This seems to be logistic because the bag is designed and stitched ergonomically and per anthropometric measurements. Cushioned straps make it comfortable on shoulder when reduced stress and hinders pain in hand and back. It's well shaped pocked in front reduces unnecessary body movements subsequently, it takes less time in cotton picking as compared to conventional bag. Further, all the respondents found it multiple uses potential, so consistency of use increases accordingly. These findings are in consonance with Gandhi *et al.*, 2012, Dahiya and Yadav 2014.

Perceived adoption feasibility of ergonomic intervention was worked out on five attributes. Regarding relative advantage adoption feasibility index score was found 97.33 per cent. However, out of five attributes of relative advantage four were found having rank 3 namely monetary benefit (MS 3), consistency of use (MS 3), time saving (MS 3) and multiple use potential (MS 3). It may be concluded that all the

Table 2. Perceived acceptability of cotton picking bag by farm women

n=100

Health related parameter	Conventional bag		Cotton picking bag	
	Frequency	Percentage	Frequency	Percentage
Strain on shoulder	72	72	5	5
Pain in hand	67	67	12	12
Pain in back	28	28	12	12
Pain in neck	5	5	-	-
Working efficiency related time taken for one loading				
Less than ½ h	10	10	60	60
1 -2 h	70	70	2	2
Provision of modification as per body measurements	-	-	80	80
Multiple use potential	2	2	80	80

respondents found the technology relatively advantageous on four attributes expect low initial cost (MS 2.6), respectively.

Regarding compatibility attributes adoption feasibility index was found 76.67 per cent. Physical compatibility got highest MS 2.60 followed by cultural compatibility (MS 2.40), situational and relational compatibility (MS 2.20) and social compatibility MS 2.10, respectively.

As regards simplicity complexity, adoption feasibility index was found 69.33 percent. All the respondents perceived increase in efficiency (MS 3), by using ergonomic intervention. It was followed by application simplicity MS 2.60, cognitive simplicity (MS 2), reversibility (MS 1.60) and resource simplicity MS 1.20.

Regarding practicability attribute, adoption feasibility index was found 80.83 per cent. All the respondents perceived that by using the intervention results were visible (MS 3.0). It was followed by triability (MS 2.40) and provision of modification (MS 2.40) and communicability MS 2. It may be concluded from the results that the intervention was perceived highly feasible on many parameters like monetary benefits (MS 3). Consistency of use (MS 3), time saving (MS 3), multiple use potential (MS 3), visibility of results (MS 3) and increase in efficiency of farm women (MS 3). The results are in consonance with Yadav *et al.*, 2010 and Gandhi *et al.*, 2012, 2014.

CONCLUSION

It was concluded by the results of the study that the provided technologies succeeded in reducing aches in the body at different

regions. Majority of the women found reduced strain and pain in shoulder and hand. The working efficiency of respondents increased with the use of protective tools which provided protection while picking cotton. Performance evaluation was worked out and it was found that intervention given in form of front line demonstration on ergonomic kit was drastically

Table 3. Perceived adoption feasibility of recommended ergonomic intervention by women n=100

Attribute	WMS	Mean score	Rank
1. Relative advantage			
Low initial cost	130	2.6	VII
Monetary benefit	150	3.0	I
Consistency of use	150	3.0	I
Time saving	150	3.0	I
Multiple use potential	150	3.0	I
Total	AFI= 97.33 per cent		
2. Compatibility			
Cultural compatibility	120	2.40	X
Physical compatibility	130	2.60	VII
Situational compatibility	110	2.20	XIII
Social compatibility	105	2.10	XVI
Relational compatibility	110	2.20	XIII
	AFI= 76.67 per cent		
3. Simplicity complexity			
Cognitive simplicity	100	2.0	XVII
Application simplicity	130	2.60	VII
Adoption simplicity	60	1.20	XX
Resource simplicity	80	1.60	XIX
Reversibility	150	3.0	I
	AFI= 69.33 per cent		
4. Practicability			
Communicability	100	2.0	XVII
Visibility of results	150	3.0	I
Demonstrability	110	2.20	XIII
Triability	120	2.40	X
Provision of modification	120	2.40	X
	AFI= 74.67 per cent		
	Overall AFI= 80.83 per cent		

WMS- Weighted Mean Score; AFI- Adoption feasibility index

helpful in reducing health hazards and increasing their efficiency in terms of picking operation per day. Perceived feasibility was found very high on adoption attributes by all women farmers.

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Received for publication : November 12, 2019

Accepted for publication : May 7, 2020