

A Comparative Analysis on Knowledge and Adoption Level of Farmwomen Regarding Fruit and Vegetable Preservation Technologies: A Micro Study by KVK, Ganjam-I

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Authors' contributions

This work was carried out in collaboration among all authors. Author SKS designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AP and BG collected the data through interview schedule. Authors CD and AKC tabulated and refined the data. Author PKP managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

The study was conducted during 2017-2019 in Ganjam district with the objective to find out the effectiveness of training programme of Krishi Vigyan Kendra (KVK), Ganjam-I, on knowledge and adoption level of trainee farmwomen regarding fruit and vegetables preservation technologies. A total 400 respondents were selected for the study which includes 200 trainee farmwomen from the adopted villages, where Krishi Vigyan Kendra Ganjam-I, had conducted training programmes in the area of fruit and vegetables preservation technologies and 200 non-trainee farmwomen

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selected from villages which were not covered by the KVK. The data revealed that majority, (i.e., 72.50 percent) of Trainee Farm-Women were having medium level of knowledge regarding Fruit and Vegetable Preservation technology, followed by those (20.00 percent and 7.50 percent) having high and low level of knowledge, respectively. Whereas, in case of Non-trainee farmwomen, all of them had low level of knowledge regarding Fruit And Vegetable Preservation technologies. Further the analysis of adoption scores of Trainee Farm-women revealed that (79.50 percent) of Trainee Farmwomen had medium level of adoption, followed by (20.50 percent) those having high level of adoption and (18.50 percent) are having low level of adoption as far as Fruit and Vegetable Production technologies are concerned, while in case of Non-Trainee Farm-women, all of them were having low level of adoption. This indicates that there has been significant difference between the trainees & non-trainees with regard to their Knowledge and Adoption of fruit and vegetables preservation technology.

Keywords: Effectiveness; training; knowledge; adoption; preservation technologies.

1. INTRODUCTION

India is the second largest producer of the fruits (81.285 million tonnes) and vegetables (162.19 million tonnes) in the world, has been bestowed with wide range of climate and physio-geographical conditions and as such is most suitable for growing various kinds of horticultural crops such as fruits, vegetables, flowers, nuts, spices and plantation crops [1]. Fruits and vegetables are an important supplement to the human diet as they provide the essential minerals, vitamins and fiber required for maintaining health. Fruits and vegetables account for nearly 90% of the total horticulture production in the country [2]. Fruits and vegetables account for the largest portion of that wastage. 18% of India's fruit and vegetables production valued at Rs. 13300 crore is wasted annually.

About 30% of the fruits and vegetables grown in India get wasted annually due to lack of proper cold storage infrastructure which is a cause of concern. After harvest, fruits and vegetables are liable to accelerated physiological, chemical, and microbial processes that invariably lead to deterioration and loss of wholesomeness. Keeping all these facts under consideration, value addition of surplus vegetables and fruits could be one of the ways to minimize the loss. In a country like India, where half of the productive workforce are women, they have been playing a great role since ages as far as value addition of fruits and vegetables are concerned.

Rural women often manage complex households and pursue multiple livelihood strategies. Their activities typically include producing agricultural crops, tending animals, processing and preparing food, working for wages in agricultural or other

rural enterprises, collecting fuel and water, engaging in trade and marketing, caring for family members and maintaining their homes. Many of these activities are not defined as "economically active employment" in national accounts but they are essential to the wellbeing of rural households [3,4,5,6].

Agriculture is the backbone of the Indian economy. Women play a vital role in building this economy [7,8] Over the years, there is a gradual realization of the key role of women in agricultural development and their vital contribution in the field of agriculture, food security, horticulture, processing, nutrition, sericulture, fisheries, and other allied sectors. In horticultural sector, women play a significant role in different operations such as nursery raising, planting, weeding, harvesting and seeds storage, whereas men mainly take care of marketing aspects. Thus the role of women are conned to major field operations [9,10].

The Krishi Vigyan Kendras'(KVKs) is an agricultural extension centre in India. The name means 'Farm Science centre' designed by Indian Council of Agricultural Research for speedy transfer of technology to the farmer's field [11] KVK of the district is playing a catalytic role for the socio-economic development of the farmers. The team of multi disciplinary scientists placed in the KVK assesses, refines and disseminates technologies related to agriculture and allied sectors. There are two KVKs functioning in the district Ganjam. Krishi Vigyan Kendra, Ganjam-I is operating at Bhanjanagar with 11 blocks, similarly KVK, Ganjam-II is operating at Berhampur with rest 11 blocks.

As per the defined activities Krishi Vigyan Kendra Ganjam-I, conducts many training programmes

exclusively for farmwomen with the aim to make them competent in performing various activities related to agriculture and allied sector. These programmes are being organised since inception of KVK, as per the thrust areas and training needs identified. KVK, Ganjam-I, has been conducting training programmes in Fruit and Vegetable Preservation technologies for Farmwomen in adopted villages. This study focuses on the level of knowledge and adoption of different technologies related to Fruit and Vegetable Preservation between the trainees and a control group.

2. MATERIALS AND METHODS

The study was conducted in Ganjam district of Odisha state. This district comprises of 22 blocks, from which four blocks namely Bhanjanagar, Jagannathprasad, Belaguntha and Aska were selected for the study purposively because these blocks are adopted by KVK, Ganjam-I for undertaking various mandatory activities. 200 trainee farmwomen trained by KVK, Ganjam-I, in fruit & vegetable preservation technologies were purposively selected for the study and in order to assess the impact of the selected training programmes on trainee farmwomen, an equal number i.e., 200 number of non-trainee farmwomen were also selected randomly from other 4 blocks of Ganjam district, namely Seragada, Dharakote Polosara and Beguniapada. These blocks had not been covered by KVK, Ganjam-I but there are quite a good number of Women Self Help Groups operating and practicing fruit and vegetable preservation. From each specified block, an equal number of villages (i.e. 2 villages from each block) were selected for the study.

The data were collected through personal interview method, the two groups, i.e., trainees and non-trainees of specified programmes were compared with respect to two dependent variables, selected for the study, viz. gain in knowledge and adoption.

Type of category =

$$\frac{\text{Maximum score} - \text{Minimum score}}{\text{No of categories}}$$

The scores were categorized into low, medium, high and to test the significance of difference between mean knowledge and adoption score of trainees and non-trainees, correlation, unpaired t-test was employed.

3. RESULTS AND DISCUSSION

3.1 Impact of Fruits and Vegetables Preservation Training on Gain in Knowledge by Trainee Farmwomen

The frequency distribution and mean knowledge score with respect to Fruit and Vegetable Preservation training was worked out in Table 1. A perusal of figures in table indicated that the majority of Trainee Farmwomen (72.50%) had medium level of knowledge of Fruit and Vegetable Preservation; whereas high and low level of knowledge was reported by (20.00 and 7.50 per cent) of Trainee Farmwomen, respectively, by Trainee Farmwomen. In case of Non- Trainee Farmwomen, all of them were having low level of knowledge regarding techniques of fruits and vegetables preservation. As evident from Table 1, the mean knowledge score of Trainee Farmwomen and Non- Trainee Farmwomen were found to be 28.61 and 3.87, respectively. That meant, the mean score of Trainee Farmwomen was substantially higher (639.28%) than the score obtained by Non- Trainee Farmwomen. To test the significance of difference between mean knowledge score of Trainee Farmwomen and Non- Trainee Farmwomen, unpaired (independent samples) t-test was applied. The calculated t-value (33.674) was found to be highly significant at 0.5 per cent level, thereby suggesting a significant gain in knowledge by Trainee Farmwomen because of the training they have received from KVK.

The mean knowledge score of Trainee Farmwomen was 639.28 per cent higher than Non-Trainee Farmwomen. In other words, scores of gain in knowledge for Trainee Farmwomen were 6.4 times more as compared to Non-Trainee Farmwomen. Such a highly difference could be because of the reason that the information imparted through Fruit and Vegetable Preservation training programme might have been due to new and scientific (standardized technique), which was not available to Non- Trainee Farmwomen through any other supplementary sources. This finding corroborates those of Damisa et al. [12], Dhaka [13] and Mehta et al. [14].

It may be readily inferred from the above results that as far as gain in knowledge regarding Fruit and Vegetable Preservation was concerned training had a definite and visible impact on Trainee Farmwomen when compared with Non-Trainee Farmwomen.

3.2 Impact of Fruits and Vegetables Preservation Training on Extent of Adoption of Trainee Farmwomen vis-à-vis the Adoption-level among Non-trainee Farmwomen

The frequency and mean scores regarding Trainee Farmwomen and Non- Trainee Farmwomen regarding adoption of Fruit and Vegetable Preservation techniques were worked out, and +have been presented in Table 2. Data revealed that majority of Trainee Farmwomen (79.50%) had medium level of adoption regarding Fruit and Vegetable Preservation techniques; whereas, 20.50 per cent of them had high level of adoption, which meant that no respondent was having low level of adoption of Fruit and Vegetable Preservation techniques. In case of Non- Trainee Farmwomen, all of them had low level of adoption of Fruit and Vegetable Preservation techniques.

The mean adoption scores of Trainee Farmwomen and Non- Trainee Farmwomen, in terms of adoption of Fruit and Vegetable Preservation techniques, were found to be 14.03 and 1.92, respectively, as indicated in Table 2. The calculated t- value (42.593) was found to be highly significant at 0.5 per cent level of significance. In other words, the adoption of Fruit and Vegetable Preservation technologies by the trainees was 6.3 times higher than that in case of non-trainees. The higher level of adoption may be attributed due to the higher knowledge gain by

the trainee as explained in the preceding sub-heading. Knowledge-gain and extent of adoption by the trainees were directly proportional, as the knowledge-gain increased the adoption of Fruit and Vegetable Preservation technologies also increased with corresponding level. In other words, this phenomenon may be explained on the basis of very low (practically nil) adoption by non-trainees due to the lack of information on Fruit and Vegetable Preservation technologies. Since information imparted through training programme was scientific (standardized technologies), it was not possible for non- trainees to adopt them without going through the Fruit and Vegetable Preservation training programme. This research finding is line with the findings of Singh [15], Sharma et al. [16] and Singh et al. [17].

3.3 Association between Selected Traits of Trainee Farmwomen and Impact of Fruits and Vegetables Preservation Training Programme on Trainee Farmwomen

The association was studied by using correlation analysis under following sub-heads :

1. Correlation of selected traits with gain in knowledge
2. Correlation of selected traits with the extent of adoption.

Table 1. Distribution of respondents on the basis of their level of knowledge related to fruits and vegetable preservation

Knowledge level	Categories		Total (N=400)
	Trainees (n ₁ =200)	Non-Trainees (n ₂ =200)	
Low (< 20)	15 (7.50)	200 (100.00)	215 (53.75)
Medium (21-40)	145 (72.50)	0 (0.00)	145 (36.25)
High (> 40)	40 (20.00)	0 (0.00)	40 (10.00)
Total	200 (100.00)	200 (100.00)	400 (100.00)
Overall score	28.61	3.87	t-value = 33.674***

Figures given in parentheses indicate percentages. *** P<0.5

Table 2. Distribution of respondents on the basis of their extent of adoption of techniques of preservation of fruits and vegetables

Adoption level	Categories		Total (N=400)
	Trainees (n ₁ =200)	Non-Trainees (n ₂ =200)	
Low (< 9)	0 (0.00)	200 (100.00)	200 (50.00)
Medium (10-18)	159 (79.50)	0 (0.00)	159 (79.50)
High (> 18)	41 (20.50)	0 (0.00)	41 (20.50)
Total	200 (100.00)	200 (100.00)	400 (100.00)
Overall score	14.03	1.92	t-value= 42.593***

Figures given in parentheses indicate percentages. *** P<0.5

3.3.1 Correlation of selected traits with gain in knowledge

The correlation analysis of independent variables with gain in knowledge was worked out, and has been presented in Table 3. As indicated in the table, age, family size, family type, land-holding and social participation were found to have negative but significant correlation with gain in knowledge of trainee farmwomen as regard to Fruit and Vegetable Preservation training.

Age was found to have a negative but significant association with gain in knowledge regarding Fruit and Vegetable Preservation training. It indicated that with increase of age, there was decrease in gain in knowledge. Hence, younger farmwomen gained more knowledge through Fruit and Vegetable Preservation training programme than older farmwomen. Thus, the fact, “younger people group” are more and more prone to change than older people is well justified here, also, as far as Fruit and Vegetable Preservation training are concerned.

Education of trainee farmwomen was found to be positively and significantly related to their gain in knowledge. This indicated that with the increase in education level, the gain in knowledge regarding Fruit and Vegetable Preservation training also increased.

Table 3. Association between selected traits of farmwomen and gain in knowledge regarding fruit and vegetable preservation training

Traits	'r' value
Age	-0.17786**
Education	0.19113**
Family size	-0.20745***
Family type	-0.28816***
Land holding	-0.18938**
Social participation	-0.20809***
Extension contacts	0.07915
Mass media exposure	0.06173

* Significant at 5 per cent level;

** Significant at 1 per cent level;

*** Significant at 0.5 per cent level

The plausible explanation for this result may be that: education might have provided a platform to people to learn more and gain more information in a given learning situation. The course content and the information of Fruit and Vegetable Preservation training programme had been such that it required basic education as a pre-requisite for understanding. Because of this

reason also, education was found to be correlated significantly with knowledge gain from Fruit and Vegetable Preservation training; the relationship with family size, family type and gain in knowledge about Fruit and Vegetable Preservation was found to be negative and highly significant. This result meant that farmwomen from big families and joint family gained less knowledge through Fruit and Vegetable Preservation training programme. This is because; they could not concentrate more due to hectic pressure of household chorus. In other words, higher the family size, lower shall be the knowledge gain as far as Fruit and Vegetable Preservation training was concerned.

Land-holding was found to be negatively and significantly correlated with gain in knowledge. It meant that an increased land-holding (as independent variables) resulted in decreased gain in knowledge with regard to Fruit and Vegetable Preservation technologies. This meant higher the land-holding lesser would be the gain in knowledge.

Social participation was found to be negatively and significantly correlated with gain in knowledge with regard to Fruit and Vegetable Preservation technologies. It meant higher the social participation lesser would be the gain in knowledge. This may be due to the fact that only the older women are involved in social participation than the young ones. Moreover, the knowledge of Fruit and Vegetable Preservation technologies required younger educated farmwomen.

Extension contact and mass media exposure showed non-significant relation with the gain in knowledge of farmwomen regarding Fruit and Vegetable Preservation training programmes. These respondents had not been exposed to such change agents, who will orient them about preservation technology. It meant that the change in these traits would bring about the corresponding change in knowledge gain, however, that might not be significant, statistically.

3.3.2 Correlation of selected traits with the extent of adoption

The correlation coefficient value presented in Table 4 indicated that age, family size and family type showed a negative but significant relationship with the extent of adoption of Fruit and Vegetable Preservation training programme. On the other hand, education, social participation and mass media exposure was found to have positive and significant correlation with the extent of adoption.

Age and adoption was found to have negative correlation. It meant that higher the age, lower shall be the adoption. It can be inferred, here, that the younger farmwomen had a tendency to adopt methods learned through Fruit and Vegetable Preservation programmes.

Education was found to be significantly and positively correlated with the extent of adoption. This meant that educated farmwomen had a better tendency to adopt Fruit and Vegetable Preservation methods. Higher the education better shall be the adoption could be a logical inference from this result. Family size and family type had negative and significant relationship with the extent of adoption regarding Fruit and Vegetable Preservation. The trends were found to be same, as was the case apropos gain in knowledge, which has been already explained in the preceding sub-headings. It meant that family size as well as family type affected the extent of adoption, negatively but significantly. Social participation and mass media exposure were found to be positively and significantly related to the extent of adoption. It meant that more the social participation and exposure to mass media, higher shall be the adoption. These variables were providing opportunity to the farmwomen for gaining information, which in turn, strengthened their tendency to adopt Fruit and Vegetable Preservation technologies.

Land-holding and extension contact were found to be non-significantly correlated with the extent of adoption. It meant that change in these traits would bring about the corresponding change in extent of adoption, although at statistically non-significant level.

Table 4. Association between selected traits of farmwomen and extent of adoption regarding fruit and vegetable preservation training

Traits	'r' value
Age	-0.17669**
Education	0.13008*
Family size	-0.15023**
Family type	-0.17886**
Land holding	-0.03421
Social participation	0.14925*
Extension contacts	0.07326
Mass media exposure	0.15143**

* Significant at 5 per cent level;

** Significant at 1 per cent level;

*** Significant at 0.5 per cent level.

4. CONCLUSION

The higher level of knowledge & adoption of Fruit and Vegetable Preservation technologies may be attributed due to the higher knowledge gain by the trainees. Knowledge-gain and extent of adoption by the trainees were directly proportional, as the knowledge-gain increased the adoption of Fruit and Vegetable Preservation technologies also increased with corresponding level. In other words, this phenomenon may be explained on the basis of very low (practically nil) adoption by non-trainees due to the lack of information on Fruit and Vegetable Preservation technologies. Since information imparted through training programme was scientific (standardized technologies), it was not possible for non-trainees to adopt them without going through the Fruit and Vegetable Preservation training programme. Therefore, it could be employed that more & more such training programmes in Fruit and Vegetable Preservation may be conducted which would be beneficial for Farmwomen in particular & farming community in general.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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