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Impact of nutrition education on gain in knowledge of rural women to achieve nutritional food security

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Abstract
Context: Household food security is essential for any person to have an adequate and balanced food intake. However, to attain good health and nutritional status requires not only access to food but also sufficient and appropriate knowledge and skills to prepare a variety of foods to family members in the right quantities and combinations. Nutrition education is recognized as a vital tool for empowering rural women and helping them to maintain better health in all aspects of life.
Objective: This study aimed to evaluate the impact of a training program on gain in knowledge and change in attitudes of rural women regarding nutrition education to achieve nutritional food security.
Methods: The study was conducted at Krishi Vigyan Kendra, Mandkola, CCSHAU, Hisar, with a sample size of 120 rural women belonging to the scheduled caste families. Each group of 30 women received training on various aspects, including a balanced diet, sources of nutrients, different cooking methods, nutrient conservation, food hygiene and sanitation, the importance of green leafy vegetables, low-cost nutritious recipes, value-added pearl millet products, and fruit and vegetable preservation.
Results and Discussion: The results indicated that more than 70.00 to 81.00 percent of women had significant improvement in knowledge after participating in the five-day intervention program on nutrition education. More than 70.00 percent of women became fully skilled and confident in preparing a balanced diet, low-cost nutritious recipes, value-added pearl millet products, and fruit and vegetable preservation. The overall impact of the training was recorded at 72.59 percent.
Significance: Trained women become empowered with the new knowledge, skill and change their attitude regarding nutrition education which will improve their own and family nutritional status while incorporating these value added nutritious products in their daily diet. The knowledge gain and changed attitude of rural women will definitely lead towards rural transformation and preparation of value added products, not only fulfill nutritional security but also contribute towards their family income.

Keywords: Krishi vigyan kendra, nutrition education, rural women, training and knowledge

Introduction

In India food and nutrition problems continue to be formidable. As per the nationally representative survey, NHFS-5, 35.3% of under five children are stunted (NFHS 5, 2019). Several recent studies show the persistence of economic inequalities with respect to nutrition improvements over the last two decades. Based on the 1996 World Food Summit, Food security is defined when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. The four main dimensions of food security are physical availability of food, Economic and physical access to food, Food utilization and stability (World Bank Report). Household food security is a prerequisite for any person to have an adequate and balanced food intake. However to attain good health and nutritional status, people need sufficient knowledge and skills to grow, purchase, process, prepare, eat and feed to their families a variety of foods, in the right quantities and combinations. This requires a basic knowledge of what constitutes a nutritious diet and how people can best meet their nutritional needs using available resources (Bhushanam GV, Rani MU. (2013) [3]. Nutrition education is an important measure to improve food and nutrition security, since food and nutrition insecurity are the main reason for poor nutritional status of the people (Alka and Mall R. 2019) [1]. It plays a significant role in providing a long-term and effective solution to the problem of malnutrition, particularly among school children (Sati & Dahiya, 2012; Ramchandran, 2013) [12].

Nutritional knowledge is essential for the proper management of food, understanding the importance of different food groups, meeting nutritional requirements for various age groups, preserving food, and preparing value-added products.

Nutrition education is recognized as a vital tool for empowering rural women and helping them maintain better health in all aspects of life. Women play a key role in selecting, preparing, and serving food to their families. Equipping them with proper knowledge of low-cost, nutritious alternatives is essential for ensuring good quality nutrition within households. Therefore, it is very important to educate rural women through training and demonstrations on the importance of a balanced diet, food hygiene and sanitation, value-added products, and low-cost nutritious food in daily diets to improve both family and societal nutritional status. Various efforts are being made by the government and other organizations to empower rural youth, particularly women. Krishi Vigyan Kendras (KVKs) play a important role in capacity building by providing vocational training programs tailored to rural women's needs. As grassroot-level institutions, KVKs are dedicated to offering need-based, skill-oriented training courses (Nazir *et al*., 2012) [8].

Training is a vital tool for achieving, sustaining, and accelerating development. It refers to the acquisition of knowledge, skills, and competencies through vocational or practical education that enhances specific capabilities. Training serves as the foundation of apprenticeships and provides a structured framework for human resource development. With rapid advancements in technology and innovation, training has become an increasingly powerful instrument for improving livelihoods and living conditions. Keeping these facts in mind, this study was designed to assess the impact of training on nutrition education among rural women to achieve nutritional food security.

Methodology

The present study was conducted at Krishi Vigyan Kendra (KVK), Mandkola, CCS Haryana Agricultural University, Hisar, Haryana state during the year 2021-2023. A total of 120 scheduled caste rural women respondents (30 in each group) were purposively selected based on their interest in attending the nutrition education intervention program. A five-day training program was organized separately for each group at KVK, Mandkola. The well-structured intervention program comprised of motivational lectures, demonstrations, and hands-on training. Lectures covered topics such as: balanced diet, sources of nutrients in the diet, different cooking methods, nutrient conservation techniques, food hygiene and sanitation and importance of green leafy vegetables. In addition, demonstrations were conducted on the preparation of low-cost nutritious recipes, value-added pearl millet products, and fruit and vegetable preservation. Printed literature on nutrition was also provided to each participant. Impact of the training was assessed in-terms of knowledge gain and attitude change. The data were collected personally before and after the training by using pre-structured interview schedule.

Results and Discussion

Assessment of nutritional knowledge among women respondents

Table 1 reveals that, at the pre-exposure stage, only 15.00 percent of women had some knowledge about different cooking methods, followed by value-added pearl millet recipes (13.33%) and nutritious recipes (11.00%). This may be attributed to their prior participation in various one-day training programs organized by KVK from time to time. After completing the five-day training program, highest improvement was observed in Value-added pearl millet recipes (94.00%), Different cooking methods (93.00%), Low-cost nutritious recipes (92.00%), Fruit and vegetable preservation (89.00%) and Nutrient conservation (88.00%). The knowledge gain was recorded between 73.00% and 81.00%, indicating a very high level of improvement. It was evident that rural women developed a better understanding of nutrition-related aspects, leading to a significant increase in their knowledge scores. These findings align with previous research conducted by Micha, R. (2018), Rani, P., Sangwan, V. (2016), Bala *et al*. (2020), and Raut *et al*. (2024) [10, 2, 7, 9].

Table 1: Gain in knowledge of rural women about different aspect of nutrition

Aspect	Pre-Training Knowledge score (Percentage)	Post Training Knowledge score (Percentage)	Gain in Knowledge (Percentage)
Balanced diet	07.00	84.00	77.00
Source of nutrient in diet	8.33	82.50	74.17
Different cooking methods	15.00	93.00	78.00
Conservation of nutrients	10.00	88.20	78.20
Food hygiene and sanitation	15.00	87.00	72.00
Importance of green leafy vegetables	11.70	85.50	73.80
Low cost nutritious recipes	11.00	92.00	81.00
Value added Pearl millet recipes	13.33	94.00	80.70
Fruits and vegetable preservation	12.00	89.00	77.00

Impact on Change in attitude of women regarding nutrition education

It is evident from Table 2 that rural women successfully changed their attitudes toward nutrition education at the post-exposure level. These findings align with those of Malik & Verma (2014) [6], who reported that training on fruit and vegetable processing had a significant impact on knowledge gain and attitude change, with an overall training impact of 63.51%, indicating a moderate level of improvement. Similarly, studies by Micha, R. (2018) [7] and Raut *et al*. (2024) [9]. also confirmed that educational interventions were effective in changing attitudes and improving diet quality among school-going adolescents.

Table 2: Change in attitude of women regarding nutrition education

Groups	Pre-exposure (Percentage)	Post-exposure (Percentage)	Change in attitude (Percentage)
1	15.00	86.00	71.00
2	17.00	93.00	76.00
3	11.00	84.00	73.00
4	14.00	89.00	75.00

Skill acquisition of women regarding nutrition education

Skill acquisition refers to the efficiency and expertise with which a task is performed, or the ability to apply training effectively in real-life situations. Table 3 presents the skill acquisition of rural women in the preparation of low-cost nutritious recipes, value-added pearl millet products, and fruit and vegetable preservation. The results revealed that after completing the training 76.00% of rural women became fully skilled in preparing value-added pearl millet products followed by 74.00% were confident in preparing low-cost nutritious recipes and 73.00% gained expertise in fruit and vegetable preservation. These findings indicate a significant improvement in both knowledge and practical skills regarding the preparation of nutritious food products. These results align with the studies of Singh *et al*. (2020) and another study found that on post test evaluation trainees received full knowledge on land preparation, transplanting, weed manahement, harvesting and storage followed by irrigation management (98.33%) and nursery raising (93.33%)Warbaniang E.K. *et al*.(2021). Similarly, Singh, N. *et al*. (2022) [9] reported that vocational training provided by KVK empowers marginal and small farm women by equipping them with new skills, knowledge, and a positive attitude, enabling them to contribute effectively to their households and communities.

Table 3: Skill acquisitions of rural women regarding preparation of different value added products.

Products	Pre-training	Post - training	Skill acquisition
Low cost Nutritious recipes	12.00	86.0	74.0
Value added Pearl millet recipes	11.00	87.0	76.0
Fruits and vegetable preservation	11.00	84.0	73.0

Impact Assessment Index

The data presented in Table 4 highlights the Impact Assessment Index (IAI) of nutrition education and the preparation of various nutritious products. The results indicate that the calculated IAI was found 72.59%, demonstrating a very high impact of the training program. Similar findings were reported by Malik & Verma (2014) [6], who reported that training in fruit and vegetable processing significantly contributed to knowledge gain and attitude change, with an impact of 63.51%, which is considered moderate impact of training. Similarly, Bhushanam GV, Rani MU (2013) [3]. Raut *et al*. (2024) [9], confirmed that the majority of rural women experienced substantial improvements in knowledge, attitude, and skills after undergoing training. These findings emphasize the effectiveness of structured training programs in enhancing the nutritional knowledge and skills of rural women, ultimately leading to better food security and improved dietary practices.

Table 4: Impact Assessment Index of rural women regarding nutrition education and preparation of value added products N=120

Knowledge/ Attitude	High (3)	Medium (2)	Low (1)	Total
Highly favourable (3)	52 (3×3) 468	15 (3×2) 90	02 (3×1) 6	69
Favourable (2)	23 (2×3) 138	13(2×2) 52	02 (2×1) 4	38
Somewhat favourable (1)	4 (1×3) 12	05 (1×2) 10	04 (1×1) 4	13
Total	79	33	8	60

$$\text{Impact Assessment Index IAI} = \frac{\sum \text{fi} \times \text{ci}}{\text{N} \times \text{X} \times \text{Y}} \times 100$$

$$\text{IAI} = \frac{468+90+6+138+52+4+12+10+4}{60\times3\times3} \times 100 = 72.59\%$$

Conclusion

This study concludes that training on nutrition education and value-added product preparation was successfully planned and executed for rural women, leading to a significant improvement in knowledge, attitude, and skill acquisition. A notable increase in knowledge was observed when comparing pre- and post-exposure data, demonstrating the effectiveness of the intervention. Women developed a favourable attitude and enhanced skills in balanced diet preparation, sources of nutrients, different cooking methods, nutrient conservation, food hygiene and sanitation, and the importance of green leafy vegetables. Additionally, they gained practical expertise in preparing low-cost nutritious recipes, value-added pearl millet products, and fruit and vegetable preservation. The knowledge gained and the shift in attitude among rural women will contribute to rural transformation, empowering them to make informed dietary choices. This not only enhances nutritional security but also contributes to household income generation.

Authorship contribution: The first author conceptualized, did literature review and designed the research, organized training and wrote the original draft. The second author validated, analyzed the results and reviewed the draft. The third and fourth authors supervised, visualized, and edited the manuscript.

Recommendations: The study recommends scaling up training programs on nutrition education to reach more and more rural women and enhance their knowledge about food and nutrient security.

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