Assessment Of Developed Interactive Video On Kitchen Gardening To Improve The Nutritional Status Among Maternal Aged Group Women (15-49 Years)

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Abstract

Background: The most prevalent issues in India's rural areas are malnutrition and poor health. One of the main reasons for malnutrition is the lack of access to different food products for the poor. Other causes include low purchasing power, ignorance, big family sizes, a lack of cleanliness and hygiene, and the body's inability to absorb the nutrients from food.

Objective: The goal of this study was to create an awareness level by educational intervention through the developed interactive video on kitchen gardening of maternal aged group women (aged 15-49 years).

Methodology: 100 women in the maternal age group women (15-49 years) were chosen from the Prayagraj District villages of *Mahewa Purab Patti* and *Mahewa Pashchim Patti*. 100 respondents were recruited to participate in the control group (N=50) and experimental group(N=50). In order to raise nutritional awareness among women in their maternity years, an interactive film was created as a component of the ICT intervention in Hindi. The further experimental group was divided into two groups E1 (N=25) and E2 (N=25) due to COVID regulation on mass gatherings and provided the same educational session. We looked at the impact of the intervention on both the control group and the experimental group, who did not follow the advised diet and were at risk for malnutrition.

Results: Results showed that the interactive video-based nutrition education sessions, which emphasized the value and method of kitchen gardening, had a significant advantage in terms of improving the eating habits of the maternal-aged group. Through kitchen gardening advice and safety measures, rural women gain the authority to apply it to vacant lots nearby and improve food supply, which either directly or indirectly affects their well-being and state of health.

Conclusion: The results support the need for new scientific and evaluation-based approaches to the creation and evaluation of ICT tools and field training in kitchen gardening through experts or organizations.

Keywords: Maternal malnutrition, kitchen gardening, interactive video, nutrition education

Introduction

Micronutrient deficiencies affect almost a third of the world's population (1). Growth is impeded, disease risk and duration are increased, work productivity is decreased and social and mental development is slowed. The most prevalent issues in India's rural areas are malnutrition and poor health. One of the main reasons for malnutrition is the lack of access to different food products for the poor. Other causes include low purchasing power, ignorance, big family sizes, a lack of cleanliness and hygiene, and the body's inability to absorb the nutrients from food and the secondary factor are preventive foods including pulses, vegetables, milk, and fruits are rarely consumed (2).

Every home may regularly receive fresh vegetables from a kitchen garden, which is crucial from both a dietary and financial standpoint. In developing nations like India, kitchen/home gardens have been found to be crucial in enhancing rural households' access to food security. Fruits and vegetables are consumed by purchasing them from the market, but they cannot be a regular part of everyday life for every small and disadvantaged family. This is crucial in rural places where individuals have little access to markets and meagre incomes. Fruits and vegetables are grown on a homestead give household's access to vital nutrients that may not be easily accessible or within their financial means. Vegetables are essential to a person's diet, so the rural generation needs to be made aware of their value (3).

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The kitchen garden falls under the category of bio-intensive participatory innovation that can offer availability, access, and consumption in appropriate numbers and types that supply micronutrients by not only requiring calories but also lacking in resources**(4)**. About two-thirds of the world's population suffers from iron deficiency, which lowers everyone's ability to function. A nutrition garden's primary goal is to supply the family with healthy, fresh veggies every day. A family's year-round needs for fruits and vegetables can be completely met by a professionally planned nutritional garden. The issue of hunger will mostly be addressed through site-specific initiatives like the promotion of nutrition gardens (5). The nutritious garden concept attempts to provide a constant supply of vegetables to suit the family's daily needs from the available area by employing home wastes and organic fertilizer, including water.

Significance of Nutrition garden

In the 2022 Global Hunger Index, India ranks **107th** out of 121 countries with sufficient data to calculate 2022 GHI scores. With a score of **29.1**, India has a level of hunger that is **serious** (6). The issue of hunger will mostly be addressed through site-specific initiatives like the promotion of nutrition gardens. A nutrition garden's primary goal is to supply the family with healthy, fresh veggies every day. A family's year-round needs for fruits and vegetables can be completely met by a professionally planned nutritional garden. The importance of including locally accessible fruits and vegetables like papaya, mango, guava, and green vegetables in a person's daily diet is emphasized through nutrition awareness initiatives(7). Therefore, every household or individual has a crucial role in transforming the barren ground in their immediate surroundings into a living kitchen garden where regionally distinctive seasonal fruits and vegetables are grown. The purpose of this study was to analyze the results from participant families reported and compared before and after the education intervention to determine the effect of practicing the kitchen garden on their diet.

Materials And Methods

Study Design

Strategies of educational activities intended to encourage the voluntary adoption of eating and other nutrition-related behaviours that are beneficial to health and wellbeing are referred to as nutrition education. In order to highlight the socioeconomic profile and awareness of the importance of food and diet, one-on-one contact between the researcher and the pregnant and breastfeeding mothers was required.

Selection of Participants

The case-control study was carried out in the village of Prayagraj to evaluate the effect of nutrition gardens on family nutritional consumption and socioeconomic status. The study included two villages *Mahewa Purab Patti* and *Mahewa Pashchim Patti* from Prayagraj district's maternal aged group women who were between the age group of 15 to 49 years. 100 maternal aged group of women were selected on the basis of the information collected through the assessment tool developed i.e. pre-assessed questionnaire and recorded baseline information like socio- demographic profile (gender, age, educational status, family income and food habits), anthropometric measurement (height, weight, BMI), dietary intake pattern (food frequency ratio, 24-dietary recall method, and specific question regarding food and kitchen gardening) of the respondents. After taking the nutritional-status related information, they were further divided into an intervention group (N=50) and a control group (N=50).

Ethical Consideration

The Department of Public Health, Shalom Institute of Health and Allied Sciences (SIHAS), SHUATS, Prayagraj, received ethical review and permission from the research ethics committee. The participants in the study verbally agreed. Throughout the study, privacy and confidentiality were maintained. The information was solely acquired for this study, and for the sake of this publication, it was rendered anonymous.

Educational Intervention

To assess the pre-awareness level among the selected respondents, a specific questionnaire was formulated and evaluated by the experts from the Department of Food, Nutrition and Public Health, ECHS, SHUATS, Prayagraj to gather information regarding maternal care, benefits, and procedure of kitchen gardening. Based on the recorded data through the questionnaire, it was felt that creating awareness through educational intervention brings desirable changes in attitudes and practices among the respondents. In the selected village, three educational sessions with a total of 50 maternal aged group participants were held at the *Anganbadi Kendra*. The impact of educational intervention, experimental group was distributed in E1 (n=25) and E2 (n=25) and provided educational session by exposing interactive video based on the importance and procedure adopted during kitchen gardening. The effectiveness of educational intervention has been assessed by using pre-structured questionnaire before and after the education session by both groups: the control (not involved in the educational session) and the experimental group.

Development of an Interactive video on the benefits of kitchen gardening to promote the gardening skills

Title of the interactive video

The interactive video entitled "*kitchen gardening sambandhit mahatavpurna jankari tatha kuposhan ke nivaran me iska mahatava*" contains knowledge regarding kitchen gardening and organic fertilizer.

Content

The content related to the benefits of kitchen gardening, fruits, and vegetable crops and their production with a lesser amount of investment like using locally available or household sources such as manure or seeds for planting. The interactive video consists of information by an expert from the Department of Horticulture, through the direct interaction method like a personal interview with the researcher. Expert had 20 years of research experience in vegetable science. He had published several research papers and books in his corresponding field.

Recording of the video

The Department of Mass Media and Communication professional used a DSLR (Digital Single Lens Reflex) and recording equipment to create the interactive video. The interactive video was based on a personal interview in which the researcher asked each expert question individually and received responses about the relevant issue.

Language

The Hindi language was used for making the interactive video so that the rural women were easily attaining knowledge.

Script

For the recording of the interactive video, the questionnaire was formulated which consist of five specific questions regarding kitchen gardening including (1) introduction to kitchen gardening (2) Procedure (3) benefits of kitchen gardening (4) tips and precautions regarding plantation and kitchen gardening.

Tools: Different types of tools were used to formulate the video which is enlisted below:

Kinemaster video formulation application: The video was created using the Kinemaster application since it is simple to use, manage, and create. It also offers a lot of cutting-edge features. The music can be combined and managed in accordance with the clips, graphic interchange format (GIFs), and the graphics during the creation of the video. The Android video editing app Kinemaster only functions in landscape orientation. It can be zoom in on the movie, crop the frames, add colour, and sound, and download it in HD or Full HD.

Mixing Audio: The application was used to synchronize the audio with the created characters in the moving picture. In order to help the audience perceive and comprehend the content, the film has evolved through the addition of related video images and graphic interchange format (GIF) files. Both the vocal and the background audio were blended using the kinemaster application and a mixing audio program. Since the audio was captured live, it is also included in the expertly shot video.

Editing- The interactive video was scored by the experts on the basis of timing, title, picture quality, and sound quality. The above-listed feature was again corrected by the researcher. Further, it was re-evaluated by the experts for final scoring.

Duration of the interactive video: the total duration of the interactive video was 11:18 minutes.

Statistical Analysis

The results of the pre-and post-education questionnaires were evaluated statistically. A chi-square test was used to compare the data from before and after the intervention, with 0.001 sets as the level of significance. To assess its relevance and interpret the results, the analysis of the data was performed manually using the proper Analysis of Variance methodology (ANOVA), Critical Difference, and the chi-squared test(8).

RESULTS

Baseline Assessment

Out of the 100 respondents, the majority of the respondents were found to be malnourished by checking their clinical examination, which revealed this by their stunted appearance, wasting appearance, and micronutrient deficient diseased symptoms.

Table 1. Assessment of the pre awareness level regarding to basic nutrition among the selected respondents

S No.	Particulars	Responses	Control Group	Pre Data	Post Data After First time education period	Post data (after 15 Days) After Second time education period	Post data (after 30 Day) After Third time education Period	Chi square	Table value
			N=50	N=50	N=50	N=50	N=50		
			No (%)	No (%)	No (%)	No (%)	No (%)		
1.	Meaning of Kitchen Gardening	Yes	8 (16.00)	14 (28.00)	20 (40.00)	35 (70.00)	50 (100)	45.64*	9.488
		No	42 (84.00)	36 (72.00)	30 (60.00)	15 (30.00)	00		
2.	Knowledge regarding the micronutrient rich food sources during maternal period	Yes	10 (20.00)	13 (26.00)	17 (34.00)	35 (70.00)	42 (84.00)	34.58*	9.488
		No	40 (80.00)	37 (74.00)	33 (66.00)	15 (30.00)	8 (16.00)		
3.	Knowledge regarding the procedure of kitchen gardening	Yes	11 (22.00)	11 (22.00)	19 (38.00)	37 (74.00)	50 (100)	46.69*	9.488
		No	39 (78.00)	39 (78.00)	31 (62.00)	13 (26.00)	00 (00.00)		

Table 1 indicated the selected respondents' level of expertise in kitchen gardening. Prior to the educational intervention, 8 respondents from the control group and 11 respondents from the experimental group demonstrated adequate knowledge about kitchen gardening. Twenty (40 percent) respondents from the experimental group responded favourably after receiving nutrition education. After the interval of 15 days, an educational session was given and it was found that 35 respondents (70 percent) responded favourably. At the final intervention (after 15 days intervals from the second time an educational session was provided) it was found that the awareness level had risen from 22 to 100 percent. Due to their lack of awareness about kitchen gardening during pre-exposure, the majority of respondents in the control and experimental groups did not establish any type of kitchen garden in their neighbourhood. The increasing number of respondents' positive responses during educational intervention proved that nutrition education was found effective to make them aware of the benefits of kitchen gardening.

Table 1 demonstrated the educational intervention in the maternal aged group (aged 15-49 years) had a significant increase in post-knowledge scores. After providing nutrition education for the first time, the of 17(34 percent) respondents of experimental group have shown positive responses among the 50 respondents. After an interval of 15 days education were provided again and it was estimated that 35(70 percent) respondents shows positive outcomes. After the final intervention, 42 respondents showed positive responses whereas, 13 respondents aware of the micronutrient-rich food sources. During pre-exposure, the majority of respondents from the control and the experimental group had less knowledge due to the lack of knowledge regarding micronutrient-rich foods and related kitchen gardening, poor socio-demographic profile and awareness. The increasing number of respondents' positive responses during educational intervention proved that nutrition education was found effective to make aware of them sufficiently and this effect was statistically significant. Results from the studies have recommended consuming high-quality dietary protein in order to ensure adequate intake of various nutrients, particularly those that are cause for concern (9). Research findings showed that the most iron-rich foodstuffs in each food group should be included in relevant publications and records for education, production, and consumption data (10).

Table 1 also depicted the level of knowledge regarding the procedure of kitchen gardening among the selected respondents. After providing nutrition education, the post-exposure data of the respondents was found high as compared to pre-exposure data. Post-exposure results showed 50 respondents having increased knowledge related to kitchen gardening whereas, 11 respondents scored positive responses in the pre-exposure test. The increasing number of respondents' positive responses during educational intervention proved that the nutrition education was found effective to make aware about the facts associated with kitchen gardening. Similarly, the primary goal was to increase the availability of vegetables and nutrients at the family level. Pre- and post-training questionnaires were utilized to measure participants' understanding of various areas of kitchen gardening. Vegetable availability for family and individual consumption improved as a result of the study. Vegetable consumption rose from 172 to 278 grams per person per day on average. Training programs have also helped to raise the general level of knowledge among those who have benefited from them(11).

Arokas and Ghoragali determined the impact in WRRI's kitchen gardening training in as part of the watershed project. The results of the research show that in the study region, kitchen gardening has increased environmental beauty and income for producers to some amount (12).

Table 2 Gain in Knowledge at different stages through the exposure of Interactive Video

Groups	Mean knowledge Scores								Gain in knowledge		Actual gain in knowledge	Total Gain in Knowledge
	Pre Exposure		Post Exposure After 24 hours		Post Exposure After 15Days		Post Exposure After 30Days		(N=50)	(%)		
	(N=50)	(%)	(N = 50)	(%)	(N=50)	(%)	(N=50)	(%)				
Control Group (n=50)	5	10	11	22	8	16	10	20	5	10	-	
Experimental Group E1 (n=25)	7	14	13	26	18	36	20	40	13	26	8	15
Experimental Group (n=25)	10	20	14	28	20	40	22	44	12	24	7	

Table 2 shows the knowledge level of control and experimental groups at different stages just prior to and after the intervention. The respondents were frequently asked questions by the researcher about the kitchen gardening, meaning, tips, and process which was shown in the interactive video. It was found that Knowledge level had increased 46 percent from the pre-exposure mean of 18 percent in experimental group E1 and 40 percent from the pre-exposure mean of 22 percent in experimental group E2. Therefore, among the total experimental group (50 respondents), 19 respondents gained knowledge from educational intervention by an interactive video about kitchen gardening and its benefits for the rural population. Similarly, the study have summarized that the uses of interactive video as a medium for teaching and learning are found effective, clear, and interesting in this research (13).

Discussion

Malnutrition is a key contributor to the burden of disease. The current study has demonstrated the need of education intervention based on peoples' health status and socio-demographic profile. More than half of all fatalities in children under the age of five worldwide are attributed to malnutrition, with the majority occurring in low- and middle-income countries (14). Their clinical signs and symptoms significantly emphasized by the presence of micronutrient-deficient diseases like pale nails, eyes and tongue, thin hair and nails, and dry eyes among the selected maternal age group women. Low energy intake (eating less frequently and in smaller portions) and a lack of nutritional diversity are characteristics of maternal and pediatric malnutrition. The typical diets are high in carbohydrates and saturated fats but poor in proteins, vitamins, and minerals. At the same time, hygienic conditions might differ greatly between metropolitan centers and rural locations, ranging from very poor to outstanding (15, 16).

The results showed that using educational videos directly and favorably impacts mothers' participation. The respondents' active engagement in the educational session was made abundantly obvious by their questions, comments, and discussions on the subject matter. Additionally, this video inspired the respondents to actively participate and practice the mentioned hygiene and sanitation habits at the household and personal levels. Evidence-based study makes it clear that the demonstration of kitchen gardening increased domestic vegetable production, consumption, and sharing of surplus veggies to neighbors and family members. Prior to the intervention, the respondents employed traditional methods and grew just one or two seasonal vegetables. They had to buy veggies from the market to satisfy their need. Beneficiaries from the study saw a 218.25 percent increase in vegetable output, which led to higher consumption (95.40%) and cost savings (17). Similar outcomes were seen by a study, stated that a kitchen garden's supply of fruits and vegetables would boost intake and hence lessen malnutrition (18). According to a study of urban community gardeners in the USA, food's accessibility would encourage consumption (19). Beyond the evident hunger brought on by a lack of food, we also experience hidden hunger due to micronutrient deficiencies that increase our susceptibility to infectious diseases, physical and mental impairment that lowers our productivity, and a shorter life span (20).

The study showed that there was a noticeable increase in vegetable production—by 145.12 percent—following the training and demonstration on a model kitchen garden. 47.6 percent changes in knowledge were observed and family size, land holding, experience, and training were found significantly correlated with gain in knowledge. It may be stated that, in terms of nutrient intake, calorie intake, and economic performance, kitchen gardening has proven to be a workable livelihood solution for rural people (21). Similar findings have noted that after offering training on several facets of kitchen gardens, rural women's understanding increased. According to them, training programs assisted in improving the ability of rural women by raising awareness, expanding knowledge about cutting-edge technologies, and exercising better skills that aid in rural women's empowerment (22). Following training on various topics, both reported having a greater understanding of women. According to them, training programmes helped enhance the ability of rural women by raising awareness, expanding knowledge about cutting-edge technology, and exercising improved skills that aid in the entrepreneurship that empowers rural women (23, 24). The experimental study has indicated that a web-based interactive video platform allows for the production of knowledge-rich video annotated and modularly built keeping a clear data structure, while at the same time adding depth and involvement to knowledge, enabling trainees to direct their own learning process (25).

Conclusion

As a results, kitchen gardening is an effective way to increase household food security and should be promoted and implemented across the nation. Rural women have the opportunity to work, earn money, and make good use of space and water by having a kitchen garden and it is found and summarized that uses for interactive video as a medium for teaching and learning are found effective, clear, and interesting in this research. An effective method of addressing the issue of malnutrition and food security is kitchen garden intervention. Therefore, more research is required to evaluate dietary diversity-boosting support interventions that can also increase income-generating opportunities.

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Conflict of interest

The authors declared no conflict of interest in the cause of the research.

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