



Role of Audio Visual Aids to Impart Garden-Based Nutrition Education for Preschoolers

Abhina B. ^{a++*} and Beela G. K. ^a

^a Department of Community Science, College of Agriculture, Vellayani, Kerala Agricultural University, India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Introduction: One of the most critical period in human life is the preschool years. In order to develop healthy food habits nutrition education need to be imparted at this age. There is a novel strategy to deliver nutrition education to children namely Garden-Based Nutrition Education (GBNE). Utilization of nutrition education tools can be an effective way for the delivery of GBNE.

Aim: To develop PowerPoint presentation on the importance of fruits and vegetables converts to video form and a child friendly gardening video for preschool children and assess the feasibility and acceptability.

Materials and Methods: Audio visual aids like power point presentation and videos were developed. Power point presentation on importance of fruits and vegetables was developed in such a way that it can reach the respondents and convey the intended message for preschool children with a total of 13 slides.

A documentary child friendly gardening video was constructed having a duration of nearly seven minutes with the title "Garden Based Nutrition Education" with the intention to inculcate gardening

⁺⁺ Ph.D Research Scholar;

*Corresponding author: E-mail: abhiramam1950@gmail.com;

skills among children from their early childhood years. Both the tools were developed using standardized procedures and was subjected to pre study. In order to assess the feasibility and acceptability of the developed GBNE tools it was subjected to preschool teachers/anganwadi workers and parents of preschool children. The sample consisted of 75 parents and 75 preschool teachers which was randomly selected from Kollam and Thiruvananthapuram districts of Kerala.

Results: The study reveals that, both parents and teachers finds child friendly gardening video as the most feasible and acceptable tool to impart garden-based nutrition education.

Discussion: Preschool children loves gardening ad watering. Child friendly gardening video is most involving and interesting in nature when compared to power point video.

Conclusion: Therefore it can be concluded that power point video on importance of fruits and vegetables and child friendly gardening video can be used as effective GBNE tool to teach the significance of fruits and vegetables through gardening activities.

Keywords: Garden-based nutrition education; child friendly; gardening; video; power point presentation; nutrition education; parents; teachers; preschool children.

1. INTRODUCTION

Preschool age is the critical period in the life of an individual. Intervention at this age period can make positive impacts in the diet of children [1]. Because eating habits developed at this time will be followed throughout the life style. A child is always curious about himself and also the world around him. This can be utilized to provide good food experiences. So at this time imparting nutrition education can help to promote healthy eating. Hence it should be started at early time itself when the child is ready to learn.

In order to make an impact on the food habits of children there is a new strategy named garden-based nutrition education. It is a novel concept to increase fruits and vegetables intake of children. Gardening influences child development and nature holds a prominent effect on the emotional and cognitive development of children. In the present study with the same intentions a power point presentation on the importance of fruits and vegetables and a child friendly gardening video were developed to impart garden-based nutrition education for preschool children.

2. MATERIALS AND METHODS

2.1 Garden-Based Nutrition Education Tool Development

2.1.1 Power point presentation on the importance of fruits and vegetables

Power point presentation is an application in Microsoft office package. It is accessible for most of the android phone users, laptops and computers. It is not only a mere presentation, but

also possible to include animations, recording audio, video production etc.

Designing and distribution of power point presentation:

Designing is the first stage in the development of power point presentation. Ideas after research were organized, set suitable pictures and was designed in such a way that after reaching the respondents can deliver the proposed message. Presentation was given the title "Fruits and Vegetables" and was designed on the significance of fruits and vegetables with an intention to educate the importance of fruits and vegetables. The presentation was made after the incorporation of the following themes such as: (a) parents as the role models, (b) main nutrients in fruits and vegetables, (c) benefits of good eating habits, (d) My plate and its significance, and (e) tips for parents. These sections are full of photos and plenty of tips for a healthy life. The final material was developed using pictures, animations, music and production of a video comprising all of the above things after incorporation of a background music. There are 13 slides incorporated in the presentation.

The power point presentation made into video format was uploaded in "you tube" and was shared to preschool teachers and parents of preschool children via what's app group. The link for the video form of developed power point presentation tool <https://www.youtube.com/watch?v=YOmM269Vz7Y>.

2.1.2 Video on child friendly gardening

A documentary video was created on the title "Garden-Based Nutrition Education". It contains the following themes:

- a) An introduction on garden-based nutrition education.
- b) Child friendly gardening where a vegetable garden is shown.
- c) Plants that can be grown by children and some child friendly tools.
- d) A boy engaged in gardening activities.
- e) Easy garden activities for children

Designing stage and editing stage: Designing stage in the development of video is important because of its influence on the acceptability in the audience. A theme was cultivated for the development of child friendly gardening as the first stage. After discussions with research guide the theme was fixed. An introduction by the researcher for about less than 3 minutes and a boy involved in gardening was rehearsed before the shot. The introduction was made with an intention to make the viewer's well aware of the importance of garden-based nutrition education. Shooting was done using a camera by a professional camera man at a home vegetable garden in Kulathoor.

Video shooting was done using high definition camera equipment. Editing was done with the help of an expert team. Raw materials were well arranged, extra scenes and sounds that are distracting were removed. Editing procedures were carried out in Naveen digital studio at Karakkamandapam. The final video had up to 7 minutes duration.

Distribution stage: The nutrition education video should reach a large number of respondents. So "you tube" was selected as the platform for uploading the video. Since it is the most favoured and famous page for sharing videos. The child friendly gardening video was uploaded in you tube and was shared to respondents via what's app group. The link for the child friendly gardening video: <https://www.youtube.com/watch?v=vG3sllp6un0&t=2s>.

2.2 Feasibility and Acceptability of the Developed Garden-Based Nutrition Education Tools

Feasibility and acceptability study of the developed garden-based nutrition education tools were carried out among preschool teachers/Anganwadi teachers and parents of preschool children in Kollam and Thiruvananthapuram district of Kerala.

Seventy five parents and 75 preschool teachers/Anganwadi teachers from Kollam and

Thiruvananthapuram district were conveniently selected.

Power point presentation video and child friendly gardening video was imparted to both parents and teachers. Feasibility and acceptability of the tools were assessed using structured questionnaires. Respondents were asked to fill the questionnaires shared in Google forms. For analyzing the feasibility and acceptability respondents were asked whether the tool is readable, comprehensible, interesting, relevant, attractive, gives clear message, well styled, whether a good choice for preschoolers, useful for intervention, user friendly, credible, comprehensible, and logical. Response options included 'strongly agree', 'agree', 'no opinion', and 'disagree' in order to avoid the chances of confusion in selecting the responses. Developed questionnaires were validated by committee members and was pretested.

Percentage of responses were calculated. In addition to that scoring was done. The scores were given as strongly agree = 4, agree = 3, disagree = 2 and no opinion = 1. Final score for both tools were calculated and compared for each statements.

3. RESULTS

In total 150 respondents were analyzed to assess the feasibility and acceptability of the developed tools. They are seventy five preschool teachers and 75 parents of preschool children. Power point presentation video and child friendly gardening video were shared to parents and teachers weekly.

3.1 Power Point Presentation on the Importance of Fruits and Vegetables

Table 1 indicates the percentage of acceptability and feasibility of the power point presentation developed for imparting garden-based nutrition education with fruits and vegetables as the main characters.

Contents of Table 1 shows that, 50.67% of preschool teachers and parents of preschool children strongly agrees that power point presentation is useful for intervention. Majority (53.33%) of preschool teachers and 48% of parents strongly agrees that power point presentation is user friendly. More than half of the preschool teachers agrees and parents strongly agrees that power point presentation is credible. Majority of the preschool teachers and

Table 1. Power point presentation on importance of fruits and vegetables

Statements	Strongly agree		Agree		Disagree		No opinion	
	Teacher	Parent	Teacher	Parent	Teacher	Parent	Teacher	Parent
Acceptability								
Is it useful for intervention	38 (50.67)	38 (50.67)	30 (40.00)	34 (45.33)	0	1 (1.33)	7 (9.33)	2 (2.67)
Is this user-friendly	40 (53.33)	36 (48.00)	30 (40.00)	34 (45.33)	0	2 (2.67)	5 (6.67)	3 (4.00)
Is this credible	28 (37.33)	40 (53.33)	40 (53.33)	33 (44.00)	3 (4.00)	1 (1.33)	4 (5.33)	1 (1.33)
Is this comprehensible	36 (48.00)	49 (65.33)	32 (42.67)	24 (32.00)	3 (4.00)	2 (2.67)	4 (5.33)	0
Is this readable	50 (66.67)	44 (58.67)	25 (33.33)	28 (37.33)	0	1 (1.33)	0	2 (2.67)
Is this clear	49 (65.33)	52 (69.33)	26 (34.67)	20 (26.67)	0	1 (1.33)	0	2 (2.67)
Is this logical	34 (45.33)	41 (54.67)	36 (48.00)	30 (40.00)	0	3 (4.00)	5 (6.67)	1 (1.33)
Feasibility	Teacher	Parent	Teacher	Parent	Teacher	Parent	Teacher	Parent
This tool is readable for preschoolers	25 (33.33)	23 (30.67)	40 (53.33)	29 (38.67)	6 (8.00)	11 (14.67)	4 (5.33)	12 (16.00)
This tool is comprehensible for preschoolers	22 (29.33)	27 (36.00)	46 (61.33)	34 (45.33)	4 (5.33)	5 (6.67)	3 (4.00)	9 (12.00)
This tool is interesting for preschoolers	30 (40.00)	33 (44.00)	40 (53.33)	34 (45.33)	0	2 (2.67)	5 (6.67)	6 (8.00)
This tool is relevant for preschoolers	30 (40.00)	36 (48.00)	36 (48.00)	32 (42.67)	2 (2.67)	2 (2.67)	7 (9.33)	5 (6.67)
This tool is attractive for preschoolers	31 (41.33)	35 (46.67)	40 (53.33)	33 (44.00)	4 (5.33)	1 (1.33)	0	6 (8.00)
This tool can give clear message to preschoolers	28 (37.33)	38 (50.67)	42 (56.00)	32 (42.67)	0	2 (2.67)	5 (6.67)	3 (4.00)
This tool is well styled for preschoolers	29 (38.67)	33 (44.00)	38 (50.67)	35 (46.67)	0	1 (1.33)	8 (10.67)	6 (8.00)
This tool is a good choice for nutrition intervention for preschoolers	38 (50.67)	44 (58.67)	34 (45.33)	28 (37.33)	0	2 (2.67)	3 (4.00)	1 (1.33)

Values in parenthesis indicates percentage

Table 2. Video on child friendly gardening

Statements	Strongly agree		Agree		Disagree		No opinion	
	Teacher	Parent	Teacher	Parent	Teacher	Parent	Teacher	Parent
Is it useful for intervention	50 (66.67)	42 (56.00)	20 (26.67)	30 (40.00)	2 (2.67)	1 (1.33)	3 (4.00)	2 (2.67)
Is this user-friendly	48 (64.00)	44 (58.67)	25 (33.33)	26 (34.67)	2 (2.67)	5 (6.67)	0	0
Is this credible	46 (61.33)	44 (58.67)	24 (32.00)	28 (37.33)	3 (4.00)	0	2 (2.67)	3 (4.00)
Is this comprehensible	41 (54.67)	52 (69.33)	33 (44.00)	22 (29.33)	0	0	1 (1.33)	1 (1.33)
Is this readable	44 (58.67)	46 (61.33)	20 (26.67)	29 (38.67)	1 (1.33)	0	10 (13.33)	0
Is this clear	46 (61.33)	46 (61.33)	27 (36.00)	27 (36.00)	1 (1.33)	0	1 (1.33)	2 (2.67)
Is this logical	49 (65.33)	46 (61.33)	25 (33.33)	25 (33.33)	0	0	1 (1.33)	4 (5.33)
Feasibility	Teacher	Parent	Teacher	Parent	Teacher	Parent	Teacher	Parent
This tool is readable for preschoolers	30 (40.00)	32 (42.67)	24 (32.00)	31 (41.33)	8 (10.67)	2 (2.67)	13 (17.33)	10 (13.33)
This tool is comprehensible for preschoolers	36 (48.00)	36 (48.00)	33 (44.00)	31 (41.33)	2 (2.67)	1 (1.33)	4 (5.33)	7 (9.33)
This tool is interesting for preschoolers	48 (64.00)	44 (58.67)	24 (32.00)	29 (38.67)	2 (2.67)	0	1 (1.33)	2 (2.67)
This tool is relevant for preschoolers	46 (61.33)	38 (50.67)	26 (34.67)	33 (44.00)	1 (1.33)	0	2 (2.67)	4 (5.33)
This tool is attractive for preschoolers	40 (53.33)	38 (50.67)	32 (42.67)	33 (44.00)	1 (1.33)	0	2 (2.67)	4 (5.33)
This tool can give clear message to preschoolers	42 (56.00)	40 (53.33)	30 (40.00)	31 (41.33)	0	0	3 (4.00)	4 (5.33)
This tool is well styled for preschoolers	37 (49.33)	40 (53.33)	34 (45.33)	29 (38.67)	2 (2.67)	0	2 (2.67)	6 (8.00)
This tool is a good choice for nutrition intervention for preschoolers	36 (48.00)	43 (57.33)	34 (45.33)	28 (37.33)	2 (2.67)	0	3 (4)	4 (5.33)

Values in parenthesis indicates percentage

parents of preschool children strongly agrees that the power point presentation on importance of fruits and vegetables were comprehensible (48% and 65.33%), readable (66.67% and 58.67%) and clear (65.33% and 69.33%). Forty eight per cent preschool teachers agrees and 54.67% parents of preschool children strongly agrees that power point presentation is logical.

From Table 1 it is clear that, 53.33% of preschool teachers and 38.67% parents of preschool children agrees that the developed tool is readable for preschoolers. Majority of preschool teachers and parents of preschool children agrees that the developed tool is comprehensible (61.33% and 45.33%) and interesting (53.33% and 45.33%) for preschoolers. Forty eight per cent preschool teachers agrees and 48% parents of preschool children strongly agrees that power point presentation is relevant for preschoolers. More than half of preschool teachers agrees that the tool is attractive (53.33%), gives clear message (56%) and well styled (50.67%). Majority of parents of preschool children strongly agrees that the developed tool is attractive (46.67%), gives clear message (50.67%) and well styled (44%). Fifty one per cent of preschool teachers and 58.67% parents of preschool children strongly agrees that the developed tool is a good choice for nutrition intervention for preschoolers.

3.2 Child Friendly Gardening Video

Feasibility and acceptability of developed child friendly gardening video among the preschool teachers and parents of preschool children is indicated in the Table 2 under the heading video on child friendly gardening.

Table 2 reveals that, more than half of both preschool teachers and parents of preschool children strongly agrees that, child friendly gardening video is useful for intervention (66.67% and 56%), user friendly (64% and 58.67%), credible (61.33% and 58.67%), comprehensible (54.67% and 69.33%), readable (58.67% and 61.33%), clear (61.33% and 61.33%) and logical (65.33% and 61.33%).

From Table 2 it is clear that majority of both preschool teachers and parents of preschool children strongly agrees that, the developed video is readable (40% and 42.67%), comprehensible (48% and 48%), interesting (64% and 58.67%), relevant (61.33% and

50.67%), attractive (53.33% and 50.67%), give clear message (56% and 53.33%), well styled (49.33% and 53.33%) and is a good choice for nutrition intervention (48% and 57.33%) for preschoolers.

3.3 Score for Power Point Presentation and Video

Total scores for both tools by all of the respondents were calculated and mean value for both parents and teachers were used to analyze the feasibility and acceptability of tools under each statement. The mean score of power point presentation and child friendly video given by the respondents are presented in the Table 3.

From Table 3 it is evident that, the mean score value given by both teachers and parents for useful for intervention, user-friendly, credible, comprehensible and logical is more for video. But they give more mean value to power point for criteria like readable and credible. Therefore the overall acceptability score given by both respondents were higher for the developed video. Teachers mean score for readable for preschoolers and a good choice for nutrition intervention was higher for power point presentation. While parents scored higher for the child friendly video. But both of them gave higher score for videos under the characteristics such as comprehensible, interesting, relevant, attractive, give clear message and well styled for preschoolers. Hence the overall feasible score was higher for child friendly gardening video.

3.4 Overall Feasibility and Acceptability of Power Point Presentation and Video

Mean score given by the respondents were considered and added to get the final score for each of the tool. The maximum score will be sixty, since there is a maximum score of 4 for every 15 statements. And the final overall feasibility and acceptability score of both power point presentation and video given by both preschool teachers and parents of preschool children is represented in the Table 4.

Table 4 conveys that, for both preschool teachers and parents of preschool children child friendly gardening video is the more feasible and acceptable tool. And hence the mean total is higher for the developed video.

Table 3. Mean score of the developed garden-based nutrition education tool given by preschool teachers and parents of preschool children

Characteristics	Power point (Mean score; max: 4)		Video (Mean score; max: 4)	
	Teachers	Parents	Teachers	Parents
Useful for intervention	3.32	3.44	3.56	3.49
User-friendly	3.40	3.37	3.61	3.52
Credible	3.23	3.49	3.53	3.51
Comprehensible	3.33	3.63	3.49	3.69
Readable	3.67	3.52	3.31	3.51
Clear	3.65	3.63	3.57	3.56
Logical	3.32	3.48	3.61	3.51
Total Acceptability Mean Score	3.42	3.51	3.53	3.56
Readable	3.15	2.84	2.95	3.08
Comprehensible	3.16	3.05	3.35	3.28
Interesting	3.27	3.25	3.59	3.53
Relevant	3.19	3.32	3.55	3.40
Attractive	3.35	3.29	3.47	3.40
Give clear message	3.29	3.4	3.48	3.43
Well styled	3.27	3.27	3.41	3.37
A good choice for nutrition intervention	3.45	3.53	3.35	3.47
Total Feasibility Mean Score	3.27	3.24	3.39	3.37

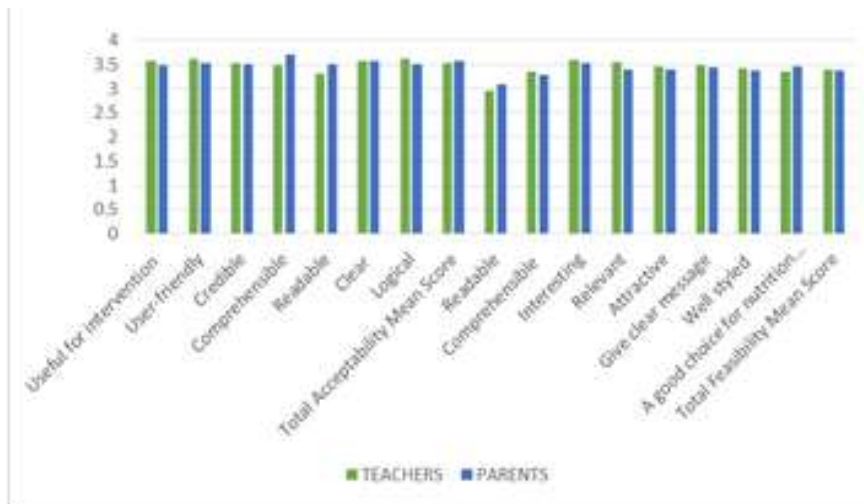


Fig. 1. Feasibility and acceptability of video

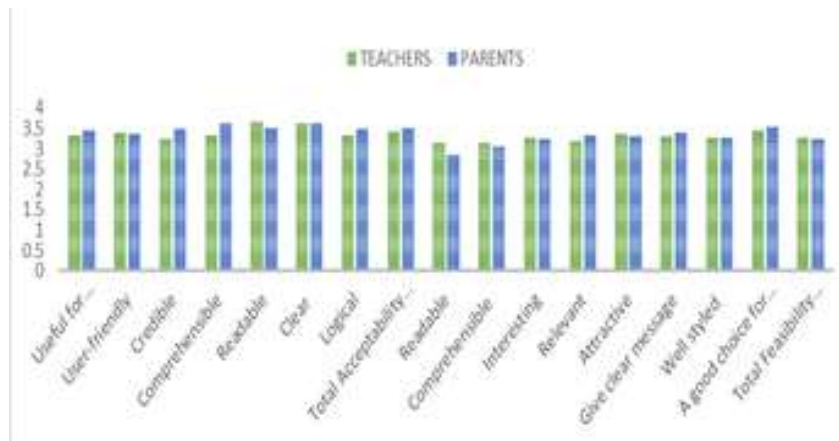


Fig. 2. Feasibility and acceptability of power point

Table 4. Feasibility and acceptability of the developed garden-based nutrition education tools

	Power point	Video
Teachers	50.04	51.83
Parents	50.52	51.85
Mean Total	50.28	51.84

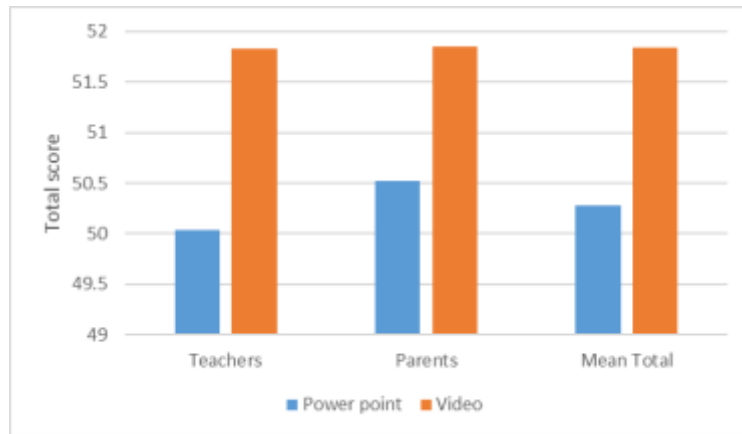


Fig. 3. Bar graph showing garden-based nutrition education tools

4. DISCUSSION

According to Marmash et al. [1] prior to a nutrition intervention feasibility and acceptability studies are conducted to make the developed nutrition education tools operative. It helps to recognize the impact of developed tools in imparting nutrition education to the targeted audience. Present research study was conducted to assess the feasibility and acceptability of the developed power point video and child friendly gardening video.

Audio visual aids has become one of the fastest method for communication of knowledge among all people, in this new era of changes in technology. Children of today are familiar to new technologies and are capable of understanding [2].

Developed power point video on the importance of fruits and vegetables were found to be feasible and acceptable for preschool teachers and parents. Slide show presentations are a traditional approach to impart nutrition education very effectively. According to Anderson [3], using visual features represent in memory with verbal information and images. Hence power point presentation helps in holding nutrition education provided to targeted audience [4]. According to Palis [5], while making an effective power point the contents should be relevant and useful and knowledge providing to bring a meaningful

difference in the listeners. So that they can retain the nutrition education provided. Current tool was also developed in this way and therefore was acceptable and feasible to the respondents.

According to Johannes [6], nutrition education programs that are computer generated helps to improve the lifestyle of people and supports them to understand about nutrition to the next level. Child friendly video developed in the present study seems to be more acceptable and feasible for both teachers and parents. Because the video was selected and developed using the characteristics put forward by Ramsay [7], while making a nutrition education video. They are (a) use actual situations (b) deliver short segments (c) present simple, single messages (d) deliver a skill in action (e) develop video in such a way that targeted audience can relate it to the settings (f) support respondents ability to conceptualize the information.

In a study conducted by Holzheimer [8], education videos proved to increase the knowledge among children. The experimental group improved their knowledge and health when compared to the control group. Educational videos are used even by the doctors as a mode of education for patients about various health related problems [9,10,11]. But videos on child friendly gardening are not much available in Malayalam languages to impart garden-based nutrition education to preschool children. Thus

this video will be helpful to improve the gardening skills and interest of children.

The hypothesis of the study was parents and teachers can choose the most feasible and acceptable tool for preschool children. Because they are the ones who knows well about their children. In the present study both preschool teachers and parents of preschool children gave higher score for the child friendly gardening video. It is the more acceptable and feasible tool. Video is more involving and can help to develop and progress the gardening interest and skills of preschool children.

5. CONCLUSION

Nutrition education tools in accessible language and multiple formats are the key for providing nutrition education in an effective manner. The developed tools: power point presentation on the importance of fruits and vegetables and child friendly gardening video is highly acceptable and feasible for both parents and teachers. Efficient, innovative and interactive nutrition education tools are the need of the hour to bring a great change and progress in the nutrition education knowledge and behavior of people. Power point presentation video and child friendly gardening video can be used as one of the GBNE tool in an effective manner.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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