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POPULARISATION AND ITS IMPACT ASSESSMENT OF DEVELOPED MULTI-SEED OATS BAR COOKIES AMONG ADOLESCENTS AND ELDERLY

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Abstract

This study has been undertaken to popularize and assess the impact of popularization of developed multi-seed oats bar cookies among adolescents and elderly. The cookies are developed with oat flour and flax seed flour, which are garnished with multi seeds. The developed cookies where popularized among adolescents and elderly peoples. The mean score for before nutritional education is 6.96 and mean score for after nutritional education is 11.48 in adolescents. After assessing statistical evaluation on the impact of popularization among adolescents, it's clear that there is an improvement of 4 to 5 scores on average after conducting popularization and nutritional awareness among adolescents. The standard deviations (SD) of scores of before and after the programme is less variable than that before the programme. That means, all people included in the study got a stable score after conducting the programme. The mean score for the pre-test and post-test scores obtained in the nutritional education among elderly for before nutritional education is 6.08 and mean score for after nutritional education is 11.75. After assessing statistical evaluation on the impact of popularisation among elderly, From the t-value (t= -10.209), we can conclude that there has been a statistically significant improvement among elderly regarding the nutritional importance of multi-seed oats bar cookies.

Keywords: Popularisation, multi-seed bar cookies.

1. AIM

Different cookies where available in the market but it contains large amount of preservatives and most of them are energy dense. Thus the development of nutrient rich cookies is essential for our society. The main aim of the study is to popularize the developed multi-seed oats bar cookies among elderly and adolescents and to assess that which age groups obtained more scores during post-test.

2.OBJECTIVE OF THE STUDY

- To popularize and assess the impact of developed multi-seed oats bar cookies among elderly and adolescents.
- To compare the scores obtained in the post test during popularization among elderly and adolescents.

3. INTRODUCTION

Cookies are most commonly baked until crisp or just long enough that they remain soft, but some kinds of cookies are not baked at all. The bar cookie, which is made up of oats and multisets, especially flax seed results in highly nutritive snack, which contain high anti- oxidants, proteins, and several other nutrients. These nutrients contain large number of health benefits. The multi-seed bar cookie base is made with oats flour, sunflower oil, flax seed powder, kalkand and salt. Thus it is garnished with multisets including flax seed, pumpkin seed, watermelon seed, chia seed and sesame seeds. The cookie is super delicious and highly nutritious. The mixture of seeds gives a nutty flavour and taste. Kalkand are replaced with sugar to make the cookie healthier and nutritive.

All seeds are nutrient dense, supportive of human health, and versatile for culinary preparations in their own way. They boost high fibre and protein content, unsaturated fatty acids such as essential fatty acids, vitamins and minerals, and antioxidants and bioactive compounds, they made them a staple in the human. Most seeds are sources of vitamin E and folate, but nutrients vary by type. Though they all have a variety of limiting amino acid content and proteins. When consuming seeds like sunflower, chia, flax, sesame, or pumpkin seeds in diet, it helps to reduce the risk of cancers, heart disease, and diabetes. It is because of the nutrients and antioxidants contained, in addition to their fibre and healthful fat content.

Oats contain several components that have been proposed to exert health benefits. Oats also helps in weight controlling. Beta-glucan fiber attracts water and increases the viscosity (or thickness) of digested food, which increases the volume of food in the gut. This slows down digestion and the rate that nutrients are absorbed, which in turn increases satiety. Oats are also used to soothe inflammatory skin conditions such as eczema.

Flax seeds are also well-known for their nutritional attributes, omega-3 fatty acids in the oil and lignans and mucilage from the seed coat. In spite of the importance of this crop, there are few molecular resources that can be utilized toward improving seed traits. Flax protein helps in the prevention and treatment of heart disease and in supporting the immune system. As a functional food ingredient, flax or flaxseed oil has been incorporated into baked foods, juices, milk and dairy products, muffins, dry pasta products, macaroni and meat products. (Ankith Goyal, 2018)

Sesame seeds are rich in protein, vitamins, minerals, and antioxidants. Sesame seeds are an excellent source of manganese and calcium, both of which help the bones grow healthy and strong. Calcium also plays a role in nerve signal transmission, muscle movement, blood vessel function, and hormone release. Other vitamins and minerals found in sesame seeds included are Phosphorous, Magnesium, Iron, Zinc, Molybdenum, Selenium, Vitamin B1.

Pumpkin seeds are rich in many antioxidants, which protect our cells from disease-causing damage and reduce inflammation in our bodies. They're also a great source of dietary fiber, which can enhance this effect. Pumpkin seeds are high in magnesium. Magnesium content helps to regulate blood sugar levels, lowering diabetes risk. Pumpkin seeds also help people with diabetes maintain blood sugar control to manage the disease. Pumpkin seeds can stop the growth of breast and prostate cancer cells. They also induce apoptosis or cancer cell death. These effects are largely attributed to pumpkin seeds' high antioxidant activity, but much more research is needed to study a broader range of cancers.

Watermelon seeds are one of the most nutrient-dense varieties of seeds. They are a rich source of proteins, vitamins, omega 3 and omega 6 fatty acids, magnesium, zinc, copper, potassium and more. Watermelon seeds also provide a good source of both monounsaturated and polyunsaturated fatty acid. Watermelon seeds are also good source of zinc. Zinc is an important nutrient, essential to the immune system. (Nadeem.et.al, 2022)

Chia seeds also can reduce blood pressure, blood sugar–lowering effects are more promising. Chia can be considered as "functional food" because apart from contributing to human nutrition, chia helps to increase satiety index, prevent cardiovascular diseases, inflammatory and nervous system disorders, and diabetes, among others. (P. Prathyusha, 2019).

Sunflower seeds are rich in vitamin E and selenium content which function as antioxidants, helps to protect the body cells from free radical's damage. It also helps to prevent chronic diseases. sunflower seed also helps to lower blood pressure, blood sugar and cholesterol levels. A compound in sunflower seeds blocks an enzyme that causes blood vessels to constrict which helps the blood vessels to relax, lowering the blood pressure.

4. METHODOLOGY

The cookies are developed with oat flour and flax seed flour, which are garnished with multi seeds. The recipe is formulated through several experiments and researches. The final recipe is conformed based on its convenience, nutritive content, shelf life and its availability. The standard procedure was adopted for the preparation of cookies using oats flour, flax seed flour and multi-seed mixture containing flax seed, pumpkin seed, watermelon seed, chia seed, and sesame seed.

The nutrient content of the standardized products per portion where calculated using the standards prescribed in the nutritive value book by C Gopalan, for the assessment of their energy, carbohydrate, protein, fat, and vitamin content. The nutrient content of the standardized product is analyzed in the Accurate analytical lab, cochin.

The developed cookies where popularized among teenagers and old age peoples. A lecture class was given to the subject selected which helps to informing the importance of the product especially the ingredients, method of preparation and nutrient content. Brochure where distributed among the peoples.

All the collected data were consolidated in the form of appropriate tables and diagrams. The consolidated data were analysed and interpreted by using SPSS. The data were analysed to determine its acceptability and is interpreted under results and discussions.

5. RESULT AND DISCUSSION

The result and discussion pertaining to the study entitled "**Popularization and Impact of Developed Multi-Seed Oats Bar Cookies Among Adolescents and Elderly"**

5.1 Mean Score of Pre and Post of Popularisation Among Teenagers

The details regarding the mean score for the pre-test and post-test scores obtained in the nutritional education among teenagers is given in the table 1

table 1
mean score of pre-test and post-test among teenagers

	N	**Mean**
Before	25	6.96±1.51
After	25	11.48±0.77

From the table 1, it can be seen that, mean score for before nutritional education is 6.96 and mean score for after nutritional education is 11.48.

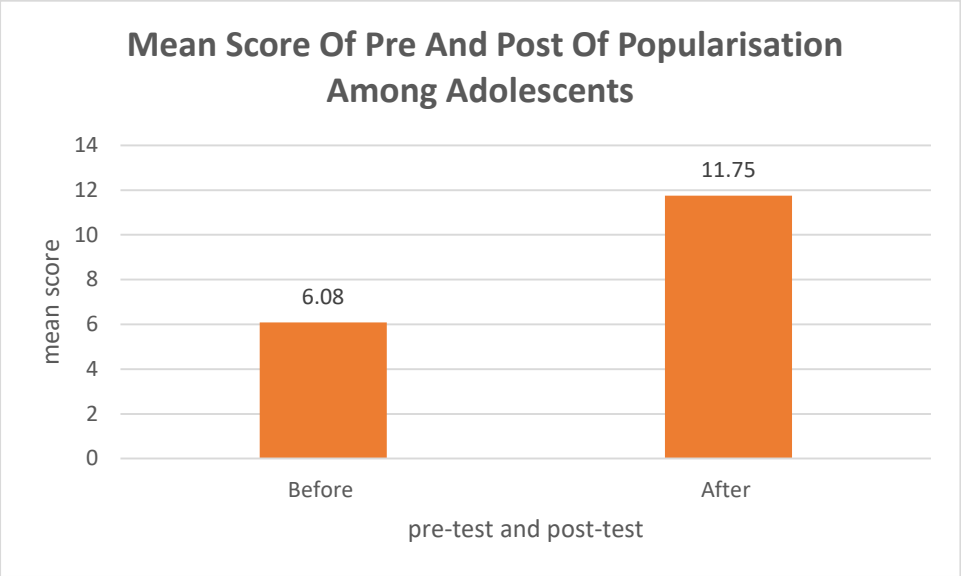

figure-1

mean score of pre and post-test among adolescents

5.2 Statistical Evaluation On the Impact of Popularization Among adolescents

The details regarding the statistical evaluation for the pre-test and post-test scores obtained in the nutritional education is given in the table 2 and table 3.

table 2

paired sample statistics

	N	Mean	Std. Deviation	Std. Error mean
Before	25	6.9600	1.51327	0.30265
After	25	11.4800	0.77028	0.15406

From Table 2, its clear that there is an improvement of 4 to 5 scores on average after conducting popularization and nutritional awareness among teenagers. The standard deviations (SD) of scores of before and after the programme reveals that the score after the programme is less variable than that before the programme. That means, all people included in the study got a stable score after conducting the programme.

table 3
paired sample test: before and after scores

	N	MEAN
Before	12	6.08±1.80
After	12	11.75±0.59

When paired sample test was conducted, the mean score obtained was -4.52000 with a standard deviation of 1.55778. From the t-value (t= -14.508), we can conclude that there has been a statistically significant improvement among teenagers regarding the nutritional importance of multi-seed oats bar cookies. ($p<0.005$).

5.3 Mean Score of Pre and Post Test of Popularization Among Elderly

The details regarding the mean score for the pre-test and post-test scores obtained in the nutritional education among elderly is given in the table 4.

table 4
mean score of pre-test and post-test among elderly

Mean	Std deviation	Std. error mean	95% confidence interval of the difference		t	df	p-value
			lower	upper			
-4.52000	1.55778	0.31156	-5.16302	-3.87698	-14.508	24	.000

From the table 4, it can be seen that, mean score for before nutritional education is 6.08 and mean score for after nutritional education is 11.75.

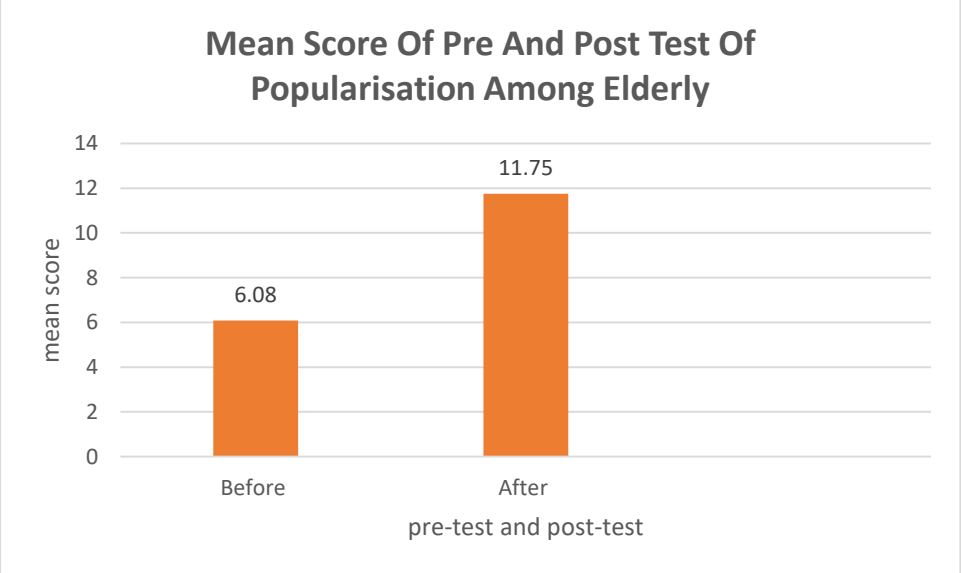

figure 2
mean score of pre-test and post-test among elderly

5.4 Statistical Evaluation On the Impact of Popularisation Among Elderly

The details regarding the statistical evaluation for the pre-test and post-test scores obtained in the nutrition education is given in the table 5.

table 5
paired sample statistics

	N	Mean	Std.Deviation	Std. Error Mean
Before	12	6.0833	1.88092	0.54298
After	12	11.7500	0.62158	0.17944

From Table 5, it is clear that there is an improvement of 4 to 5 scores on average after conducting popularization and nutritional awareness class. The standard deviation of scores of before and after the programme reveals the score after the class is less variable than that before the programme. That means, all people included in the study got a stable score after conducting the programme.

table 5

paired sample test: before and after scores

Mean	Std. Deviation	Std. Error Mean	95% confidence interval of the difference		t	df	P-value
			Lower	Upper			
-5.66667	1.92275	0.55505	-6.88832	-4.44501	-10.209	11	0.000

When paired sample test was conducted, the mean score obtained was -5.66667 with a standard deviation of 1.92275. From the t-value (t= -10.209), we can conclude that there has been a statistically significant improvement among elderly regarding the nutritional importance of multi-seed oats bar cookies. ($p<0.005$).

5.5 Cross Tabulation of Score of Post Test of Adolescent and Score of Post Test Of Elderly

The details regarding the cross tabulation of score of post-test of adolescent and score of post-test of elderly is given in the table 6.

table 6

cross tabulation of score of post-test of adolescent's and score of post-test of elderly

		Score of the post test of elderly			**Total**
		10.00	11.00	12.00	
Score of the post test of adolescents	10.00	0	0	2	2
	11.00	0	1	1	2
	12.00	1	0	7	8
Total		1	1	10	12

The table 6 compares the score of post-test of adolescents and scores of post-test of elderly of popularization. The chi-square test is used for finding out the difference or association.

table 7

chi square tests

	Value	**df**	**Assymp.sig (2-sided)**
Pearson chi square	5.850	4	0.211
Likelihood ratio	4.785	4	0.310
Linear-by-Linear Association	0.092	1	0.761
N of valid cases	12		

The table 7 shows the Chi-square test results of scores of post-tests of adolescents and elderly. As the chi-square value is greater than the expected value, it can be concluded that there is a significant difference between the scores of post-test of adolescents and elderly.

6. SUMMARY AND CONCLUSION

- It can be identified that there is an improvement in mean score of 3 to 4 after conducting popularization of developed multi-seed bar cookies and awareness class on consumption of multi-seeds. The standard deviation (SD) of scores of before and after the programme is less variable than before the programme. The popularization where conducted to two different age groups: elderly and adolescence.
- The mean score for pre-test and post-test for elderly is 6.08 and 11.05. Paired sample test was conducted to prove the impact of popularization statistically. The mean score was -5.66667 with SD of 1.92275. from the t-value (t=-10.209), it can conclude that there has been statistically significant improvement among elderly.
- The mean score for pre-test and post-test for adolescence is 6.96 and 11.48. Paired sample test was conducted to prove the impact of popularization statistically. The mean score was -4.5200 with SD of 1.55778. From the t-value (t=-14.508), it can conclude that there has been statistically significant improvement among teenagers.
- The cross tabulation of score of post-test of adolescent and score of post-test of elderly is statistically analyzed. As the chi-square value is greater than the expected value, it can be concluded that there is a significant difference between the scores of post-test of adolescents and elderly.

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