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## RESEARCH ARTICLE

EFFECTIVENESS OF SOYA BEAN SUPPLEMENTATION ON MEMORY AMONG SCHOOL CHILDREN AT SELECTED SCHOOLS, NELLORE.

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**Abstract**

**Introduction:-** During school years children become increasingly capable of and responsible for self-care activities. The ability of mind to store the past experiences of learning and utilizing them is known as memory. The development of memory in children becomes evident within first 2-3 years of a child's life as show considerable advances in declarative memory. This enhancement continues into adolescence with major developments in short term memory, long term memory. Soya bean is hailed as the most protective bean. Soya beans contain 40% protein as compared to other legumes which contain 20% protein. It has the highest protein content amongst plant products.

**Objective:-** The objective of this study was to evaluate the effectiveness of soya bean supplementation on memory of schoolchildren available in selected schools of Nellore, Andhra Pradesh.

**Methodology:-** A True –Experimental study was conducted in Z.P.H.School, located in T.P.Gudur, at Nellore District. Sample sizes of 60 school age children were selected by using stratified random sampling technique. Modified PGI Memory scale was used to assess the memory of a child.

**Results:-** The results reveal that with regard to memory status of the school children, in experimental group, during pre test, 19 (63.3%) children had very good memory and 11 (36.7%) had good memory whereas in post test, 29 (96.7%) children had very good memory and 1(3.3%) had good memory. In control group during pre test, 18(60%) children had very good memory and 12(40%) had good memory whereas in post test, 19(63.3%) children had very good memory and 11(36.7%) had good memory.

**Conclusion:-** The study concluded that there is a significant association between soya bean supplementation and, memory. There is a significant in improvement of Memory in experimental group as compared to the control group. This shows that administration of soya beans in improvement of Memory is very effective and cost effective in the enhancement of academic performance.

**Introduction:-**

Nutrition is the combination of dynamic process by which the consumed food is utilized for nourishment for structural and functional efficiency of every cell of the body, it helps to sustain the body and mind and keep it healthy. During school years children become increasingly capable of and responsible for self-care activities. The energy and nutrient needs may vary from birth to pre-school and school going ages, there are specific recommended number of servings for each of the food group for different age groups. The proteins required for the school children are 4-6 grams/kg/day as per Recommended Dietary Allowances.<sup>1</sup>

The ability of mind to store the past experiences of learning and utilizing them is known as memory. The development of memory in children becomes evident within first 2-3 years of a child's life as show considerable advances in declarative memory. This enhancement continues into adolescence with major developments in short term memory, long term memory.<sup>2</sup>

Soya bean is hailed as the most protective bean. Soya beans contain 40% protein as compared to other legumes which contain 20% protein. It has the highest protein content amongst plant products. Soya bean is the only vegetable food that contains all essential amino acids. Soya beans contain 19% unsaturated fat, 8 grams of dietary fiber, 200 to 300mg of calcium, 4.3grams of carbohydrates and abundant isoflavones.<sup>3</sup>

Lecithin is the component of lipids, and Isoflavones, phosphatidyl serine in the soya beans are responsible for improvement of memory by acting as a neurotransmitters.<sup>4</sup>

**Objectives:**

- ❖ To assess the memory among school children.
- ❖ To evaluate the effectiveness of soya bean supplementation on memory among school children in experimental group.
- ❖ To associate effectiveness of soya bean supplementation on memory of children with their selected socio demographical variables.

**Materials and methods:-**

The study was conducted by using True experimental pre test and post test design. Subjects were selected by using the probability stratified sampling technique. 60 samples were selected based on the sampling criteria and screened for memory status by using modified PGI memory scale. Among 60 school children, 30 were allotted to experimental group and 30 to control group. 15grams of cooked Soya beans supplementation was given twice a day for 28 days and post test was conducted on 30<sup>th</sup> day. The data was analyzed by using the descriptive and inferential statistics and tabulated according the objectives and hypothesis of the study.

**Ethical Clearance:** - There was no drug administration or invasive procedure involved in the study. A written permission was obtained from the institutional authority and ethical committee. Written informed consent was obtained from mothers of children and who participated in the study and Confidentiality and anonymity of the subjects was maintained throughout the study.<sup>5</sup> (HARIKA, 2015)

**Results & discussion:-****Table 1:** Distribution of Demographic Variables of child (N=60)

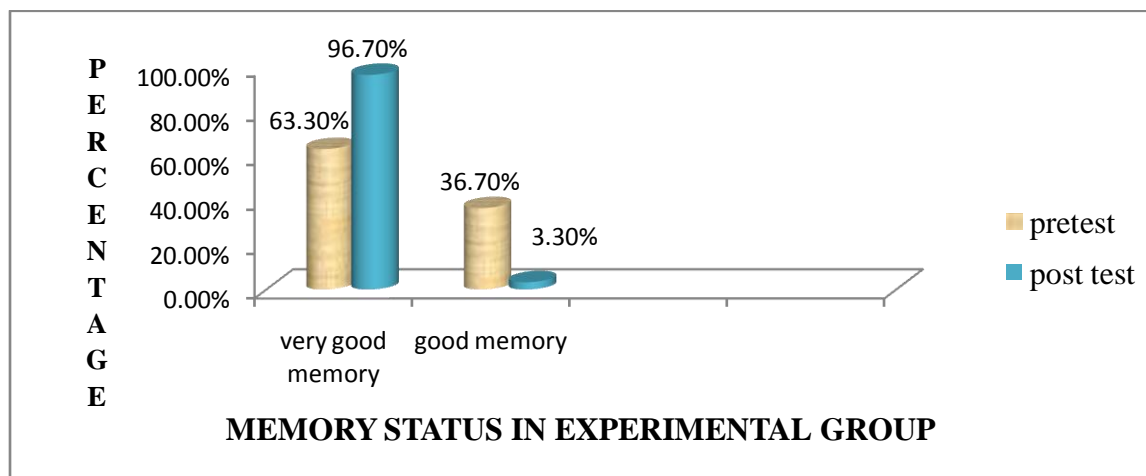
S.No	Demographic Variables	Experimental group (n=30)		Control group (n=30)	
		f	%	f	%
1.	Age	6	20	5	16.7
	a)11-12	7	23.3	3	10
	b)12-13	17	56.7	22	73.3
	c)13-14				
2.	a)Boys	15	50	15	50
	b)Girls	15	50	15	50
3.	Religion				
	a)Hindu	23	76.7	19	63.4
	b)Muslim	1	3.3	1	3.3
	c)Christian	6	20	10	33.3
4.	Education				
	a)6 <sup>th</sup> standard	7	23.3	8	26.7
	b)7 <sup>th</sup> standard	8	26.7	7	23.3
	c)8 <sup>th</sup> standard	8	26.7	7	23.3
	d)9 <sup>th</sup> standard	7	23.3	8	26.7
5.	Dietary pattern				
	a)Vegetarian	-	-	1	3.3
	b)Non- vegetarian	30	100	29	96.7
6.	Medium of instruction				
	a)English	30	100	30	100
7.	Age of mother				
	a)<30	7	23.3	6	20
	b)30-35	8	26.7	8	26.7
	c)36-40	11	36.6	14	46.6
	d)41-45	2	6.7	2	6.7
	e)Above 45	2	6.7	-	-
8.	Education of mother				
	a)Illiterate	9	30	8	26.7
	b)Primary education	10	33.3	6	20
	c)Secondary education	11	36.7	14	46.6
	d)Higher secondary education	-	-	2	6.7
9.	Occupation of mother				
	a)House wife	15	50	18	60
	b)Coolie	14	46.7	9	30
	c)Private employee	1	3.3	1	3.3
	d)Government employee	-	-	2	6.7
10.	Family income				
	a)<5000 Rs/-	15	50	11	36.6
	b)Rs 5001-7000/-	6	20	8	26.7
	c) Rs 7001-9000/-	7	23.3	8	26.7
	d)Rs9001-11000/-	2	6.7	3	10
11.	Place of residence				
	a) Sub urban	30	100	30	100
12	Medical history				
	a)Normal	30	100	30	100

**Table.1** reveals in relation to socio demographic variables, among the 60 school children, with regard to the age group, 17 (56.6%) school children were between 13-14years, regard to religion 23 (76.7%) school children were Hindus, regarding to medium of instruction all 100% children studying in English medium, regard to eating pattern 29 (96.7%) children were non vegetarians, regard to family income 15 (50%) children family income was less than Rs5000/- per month, With regard to education of children's mothers 11 (36.7%) were studied up to secondary education.

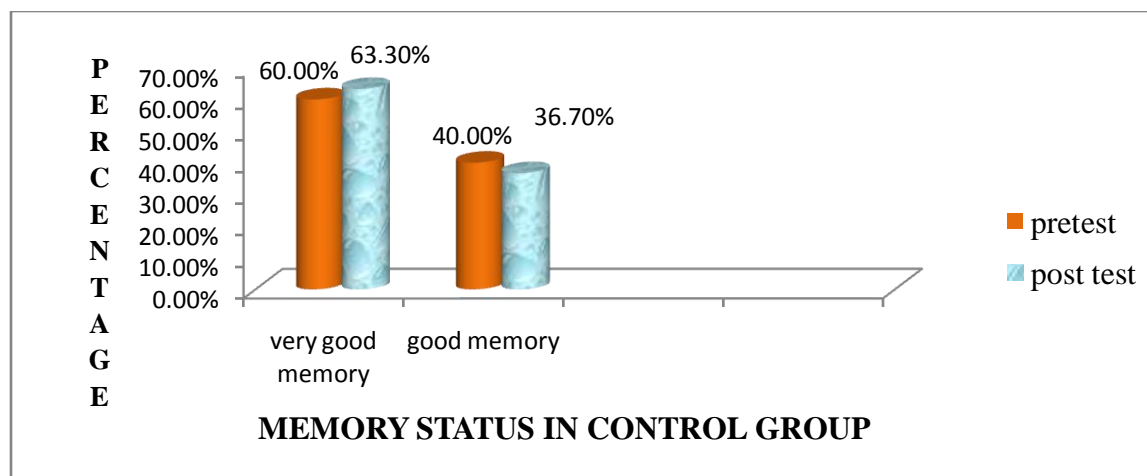
**Table.No-2:-** Frequency and percentage distribution of Memory status of school children in Experimental and Control group. (N=60)

MEMORY STATUS	PRE TEST (n=30)		POST TEST (n=30)	
	f	%	f	%
<b>Experimental group</b>				
a)Very Good memory	19	63.3	29	96.7
b)Good memory	11	36.7	1	3.3
<b>Total</b>	<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>
<b>Control group</b>				
a)Very Good memory	18	60	19	63.3
b)Good memory	12	40	11	36.7
<b>Total</b>	<b>30</b>	<b>100</b>	<b>30</b>	<b>100</b>

Table.No-2-shows that with regard to memory status of the school children, in experimental group, during pre test, 19 (63.3%) children had very good memory and 11 (36.7%) had good memory whereas in post test, 29 (96.7%) children had very good memory and 1(3.3%) had good memory. In control group during pre test, 18(60%) children had very good memory and 12(40%) had good memory whereas in post test, 19(63.3%) children had very good memory and 11(36.7%) had good memory.



**Fig no.1:-** percentage distribution of Memory status of school children in Experimental group



**Fig no.2:-** percentage distribution of Memory status of school children in Experimental group.

**Table.No-3:-** Comparison of Mean, Standard deviation of memory status among school children in both control and experimental group.

S.No	Memory status	Experimental group		Control group		Paired "t" test
		Mean	Standard Deviation	Mean	Standard Deviation	
1.	<b>Pre test</b>	81.06	4.201	86.86	4.793	Cal=5.744 Tab=3.659 P<0.001 <b>S***</b>
2	<b>Post test</b>	81.43	4.588	81.80	4.32	Cal=0.432 Tab=3.659 P<0.001 <b>NS</b>

**S\*\*\* -Very highly Significant** at  $P < 0.001$ ,  $df (n-1) = 29$

**NS -Non Significant** at  $P < 0.001$ ,  $df (n-1) = 29$

Table.No-3 shows the effectiveness of Soya bean supplementation among school children in Experimental Group. The pre test mean is 81.006 with standard deviation of 4.201. The post test means is 86.866 with standard deviation of 4.793. The calculated value of paired "t-test" is 5.744 and the table value is 3.659. The calculated value is Greater than table value hence, the null hypothesis is rejected and research hypothesis is accepted. After soya bean supplementation the mean values of memory score are increased from 81.06 to 86.86. Hence research hypothesis accepted.

Effectiveness of Soya bean supplementation among school children in Control Group. The pre test mean is 81.433 with standard deviation of 4.558. The post tests mean is 81.80 with standard deviation of 4.32. The calculated value of "paired t-test" is 0.432 and the table value is 3.659. The calculated value is lesser than table value hence, the null hypothesis is accepted and research hypothesis is rejected.

#### **Association between the post test Memory score and the socio demographic variables in Experimental group:-**

There is a significant association between post test memory scores and some socio demographic variables which includes age of child, education of child.

#### **Association between the post test Memory score and the socio demographic variables in Control group:-**

There is a significant association between post test memory scores and some socio demographic variables which includes age of child, education of child.

**Conclusion:-**

The study reveals that there is a significant association between soya bean supplementation and, memory. There is a significant in improvement of Memory in experimental group as compared to the control group. This shows that administration of soya beans in improvement of Memory is very effective and cost effective in the enhancement of academic performance.

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