

“EFFECTIVENESS OF SOYA MILK ON MALNOURISHED PRE-SCHOOL CHILDREN IN SELECTED RURAL AREA OF KUNDWADA, DAVANAGERE”**¹Dr. Anitha C, ²Rajesh Itagi, ³Dr. Krishnaraj V**¹Assistant Professor, Karnataka State Open University, Muktagangothri, Mysuru, Karnataka, India²Student, Karnataka State Open University, Muktagangothri, Mysuru, Karnataka, India³Assistant Professor, Karnataka State Open University, Muktagangothri, Mysuru, Karnataka, Indiaanithaksou@gmail.com**ABSTRACT**

Malnutrition can be defined as a lack of proper nutrition. The nutritional status of a child, as with any individual, is assessed through dietary, anthropometric, biochemical and physical observation for signs of malnutrition. The quality of soy protein is virtually equivalent in quality to that of milk and egg protein. Soybeans have almost 40% protein, making soybeans higher in protein than any other legumes and many animal products. Soya foods can play an important part in treatment and prevention of malnutrition in children. There is a felt need to access the effectiveness of soya milk on malnourished children. Hence the above study was conducted with the following objective.

Objective: To assess the effectiveness of soya milk on malnourished pre-school children

Methodology: A quantitative research approach using the pre-test and post-test was adopted for the study. The study sample consisted of 30 malnourished pre-school children from Kundwada rural, Davanagere, Karnataka. Soya milk was administered to the selected study population for 30 days, pre- and post-assessment was conducted after 30 days of soya milk intervention by using the Anthropometric measurements.

Results: Data shows that the mean post observational checklist score (13.43) is higher than the pre observational checklist score (12.7). The overall mean pre-test and mean post-test score, the paired ‘t’ value was $t_{29} = 13$, and the table value is 2.045, which showed it was significant at $p < 0.005$ level, the difference of means observed is a true difference. Soya milk intervention on malnourished children should have a positive impact through grades of malnutrition. There was a shift from moderate to mild and from mild to normal level of malnutrition.

Conclusions: Soy milk rich in nutrients was effective in maintaining and curing malnutrition. Hence this can be used as a supplementary feed for younger children.

Key words: Effectiveness, degree of malnutrition, soya milk, malnourished pre-school children.

INTRODUCTION

Children are the first call on the agenda of human resource development – not only because young children are the most vulnerable, but because the foundation for lifelong learning and human development is laid in these crucial, early years. It is now globally acknowledged that investment in human resources development is a pre-requisite for any nation’s economic development. Child survival, growth and development have to be looked at as a holistic approach, as one cannot be achieved without the others. There have to be balanced linkages between education, health and nutrition for proper development of a child.

Malnutrition implies imperfect assimilation or nutrition or both. Malnutrition, insufficient consumption of protein and micronutrients exacerbated by frequent disease and infection (WHO, 2003), is a severe and widespread problem. Under nutrition manifests in four broad forms: wasting, stunting, underweight, and micronutrient deficiencies. It has been defined as “any disorders of nutrition caused by a deficiency of proper food substances. It may be due to deficient breakdown assimilation or utilization of the food”. (1)

Globally in 2022, 149 million children under 5 were estimated to be stunted (too short for age), 45 million were estimated to be wasted (too thin for height), and 37 million were overweight or living with obesity. Nearly half of deaths among children under 5 years of age are linked to under nutrition. These mostly occur in low- and middle-income countries. The

developmental, economic, social and medical impacts of the global burden of malnutrition are serious and lasting, for individuals and their families, for communities and for countries. (2)

Pediatric malnutrition has always been a matter of national concern. The effects of malnutrition is more serious during the formative years of life which may lead to growth retardation, undernourished children do not grow to their full potential of physical and mental abilities. The findings of the study revealed that children suffered from recent and long term malnutrition were 39% and 26% respectively as per National Centre for Health Statistics (NCHS) standards. (3)

A study was conducted on Quality protein maize (QPM), with twice the amount of tryptophan and lysine than conventional maize, has improved the nutritional status of severely malnourished children. A study was conducted to measures the levels of proteins in different vegetarian sources by The Ralston Purina Company of St. Louis. The study revealed that Soyabeans contains 42% protein 33% carbohydrates, 20% oil, 5% hulls. Study concluded that soy or bean protein is best out of vegetarian sources of protein. Soya foods help children meet the dietary guidelines and that supports the normal Growth and development of children and it also improve growth when substituted in the diet of malnourished children. Thus soya foods can play an important part in treatment and prevention of malnutrition in children. (4, 5)

Soybean is one of the best sources of plant protein containing about 40% of protein (dry basis), the highest protein content among legumes and cereals. Soy proteins are highly digestible after proper heat treatment and its amino acid profile is almost well balanced except methionine to meet the requirements for human nutrition. Soy can greatly improve the nutritional value of weaning foods. Processed soy products (defatted soy flour, textured soy protein, soy protein concentrate, and soy protein isolate) have very high protein content and very high protein digestibility corrected amino acid score (PDCAAS) compared to traditional foods. (5).It is also cost effective; hence the present study was taken with the objective to assess the efficacy of soy milk on malnourished pre-school children.

METHODOLOGY:

The approach of non-randomized purposive convenient sampling was employed to choose the study's sample. The study sample consisted of thirty undernourished Pre-school children (ages three to six) who were chosen from a rural area of Kundwada, Davangere. Using the IAP Scale, the degree of malnutrition was determined (based on weight for age).

Check lists were used to extract primary data from the study respondents, including socio-demographic information about age, gender, birth order, dietary habits, parental education, total income, family type, and parental occupation. For thirty days in the morning, the study group that was chosen was given 100 milliliters of soy milk as an intervention. To determine the efficacy of soy milk, the study participants' nutritional status was evaluated both before and after the intervention. For thirty days, parents were given soybeans and instructed to make fresh soy milk each day. To make soy milk, 100 grams of soybeans were soaked for a whole night before the milk was extracted. The children were given the diluted soy milk that had been cooked with jaggery.

RESULTS

Figure- 1: Percent distribution of study population according to age

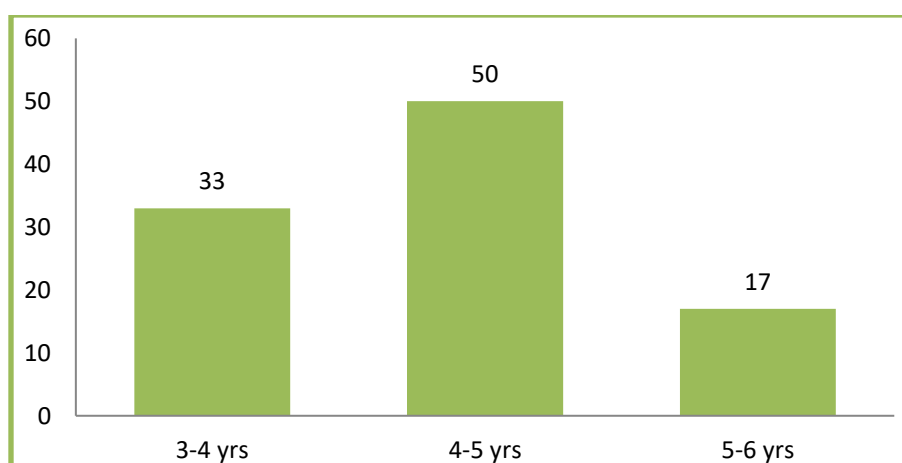
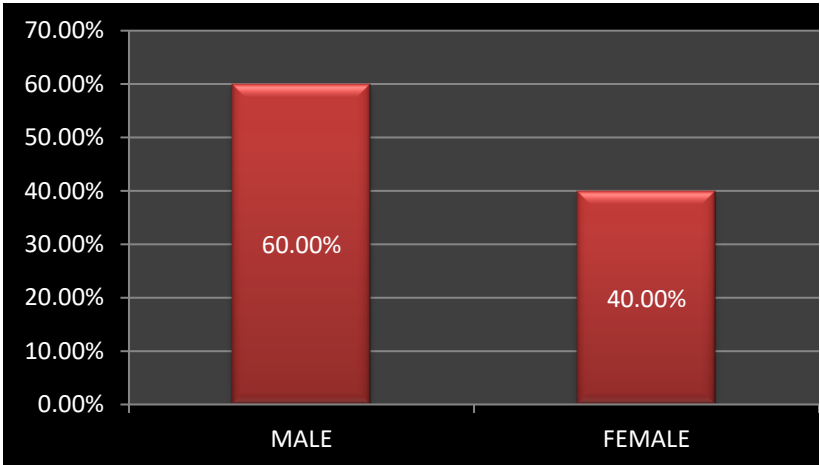


Figure- 2: Percent distribution of study population according to the gender



The age distribution of the study population is displayed in Fig. -1. Thirty-three percent of the children were between the ages of three and four, 50 percent were between the ages of four and five, and seventeen percent were between the ages of five and six. Thirty percent were girls and six percent were boys. (Figure 2).

According to the data on birth order, 46.67% of the children were born as firstborns. 13.33% of them were fourth born, while 23.33% and 16.67% of them were in the second and third orders, respectively. Of the children in the study, 26.67% belonged to nuclear families, 43.33% to joint families, and 30% to extended families. Of the parents, 44% had completed secondary education, 13% had only completed basic school, and between 36.7 and 42% were illiterate. The majority of the parents (40%) worked as coolies, followed by housewives (36.7%), men who had their own businesses were 20% private employees, and government employees (3.3%). The majority of them (50%) had household incomes under Rs.5,000, 40% had incomes between Rs.5,000 and Rs.10,000, and 10% had incomes beyond Rs.10,000.

Table-1: Pre-test mean frequency and percent distribution of study population in grades of malnutrition

Sl. No	Anthropometric Assessment	NORMAL		GRADE I		GRADE II		GRADE III	
		F	%	F	%	F	%	F	%
1	Weight	0	0	28	93.34	2	6.66	0	0
2	Height	18	60	11	36.67	1	3.33	0	0
3	IAP	1	3.33	11	36.67	16	53.33	2	6.67

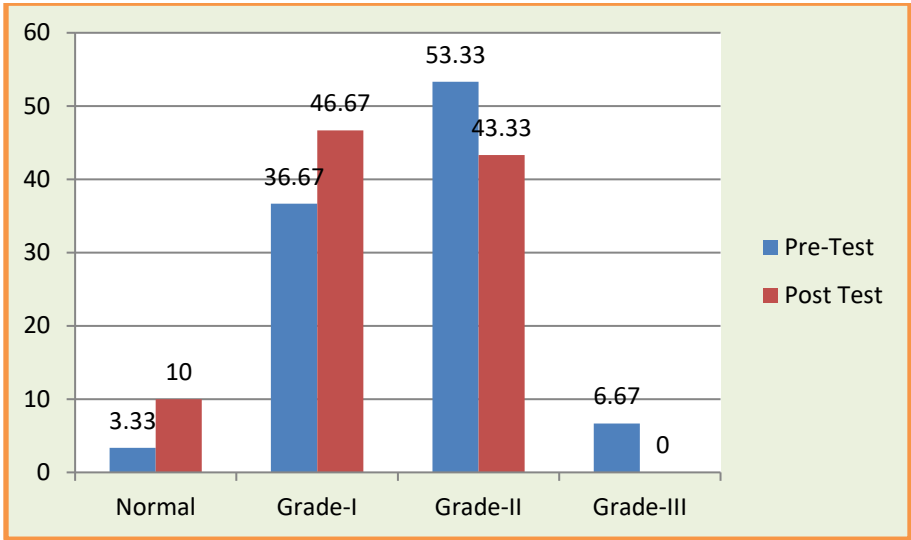
The study subjects and their degree of malnutrition are described in Table 1. 3.33 percent of children were considered normal, whereas 36.67%, 53.33%, and 6.67% of the children had grade I, grade II, or grade III malnutrition, respectively.

Table-2: Post-test mean frequency and percent distribution of study population in grades of malnutrition

Sl. No	Anthropometric Assessment	NORMAL		GRADE I		GRADE II		GRADE III	
		F	%	F	%	F	%	F	%
1	Weight	27	90	3	10	00	00	00	00
2	Height	25	83.33	5	16.67	00	00	00	00
3	IAP	3	10	14	46.67	13	43.33	00	00

Table 2 illustrated that the percentage of children experiencing varying degrees of malnutrition was shifting towards the direction of normal. As can be seen from the table, 10% of the children were considered normal, 46.67% had grade I malnutrition, 43.33% had grade II malnutrition, and none had grade III malnutrition. Similar beneficial outcomes with soy milk intervention have been reported in studies. (6, 7).

Figure 3: Pre and post assessment comparison of children in different grades of malnutrition



The effectiveness of soy milk in reducing the proportion of children experiencing severe malnutrition was a significant observation. Figure 3 shows that following the administration of soy milk, the percentage of normal children increased from 3.33 percent to 10 percent post intervention, and the percentage of children moving from grades III and II to I increased from 36.67 percent to 46.67 percent post intervention. Following the intervention, the percentage of Grade-III children was 43.33 percent as opposed to 53.33 percent, showing a dramatic decline from 6.67 percent to zero percent. Thus, the results above demonstrate that children's nutritional status has been enhanced by soy milk. (11)

Table- 3: Measurement of effectiveness of soya milk by using Paired't Test.

	Mean	SD	df	Paired 't' value
Pre-test	12.702	1.15	29	13 P<0.001
Post-test	13.43	1.07		

The aforementioned table presents the results of the paired t-test, which was used to calculate the impact of soy milk on the severity of malnutrition. The mean post-observational checklist score (13.43) is greater than the pre-observational checklist score (12.7), according to the data in the table. The t value is 13 at 29 degrees of freedom, and the difference between the mean observational checklist scores of the pre-test and the post-test is significant at the P< 0.001 level. The observed difference in means is a factual difference. This suggests that soy milk significantly reduces the level of malnutrition in preschool-aged children. Other research that support the idea that soy milk helps lower the rates of malnutrition in preschoolers have also reported similar findings. (8, 9 & 10)

SUMMARY

The majority of the world's chronically malnourished children live in India, where malnutrition in children is a risk factor for 22.4% of all diseases. The incidence of malnutrition has decreased somewhat in India during the past ten years, despite considerable efforts. Malnutrition affects around one-third of the Indian population. One of the rare vegetables that offer a high-quality protein with little to no saturated fat is soybean. Soybeans offer fiber, vitamins, minerals, and all

three of the macronutrients needed for a healthy diet. The mean was 13.43 with a standard deviation of 1.07 post-intervention, which was shown to be statistically highly significant at the $p < 0.001$ level, indicating that the soy milk was beneficial in reducing mild and moderate malnutrition. Giving soy milk to malnourished children led to weight gain; this decreased the number of children in various stages of malnutrition and increased the number of children with normal weights. The amount of malnutrition per kilogram of body weight was directly proportional to its severity.

CONCLUSION

Soy milk is particularly effective in preventing, maintaining, and curing malnutrition since it is the least expensive source of protein and other nutrients. Additionally, studies have shown that soy milk supplements improve children's overall development.

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