



Comprehensive Nutrition Supplement Programme of Karnataka State: An economic analysis

Puttaraju¹

Assistant professor of Economics

Maharani's Arts College for Women. Mysuru, Karnataka, India

Dr.H.R.Uma²

Professor of Economics and the Director

Sir M.V.P.G.Center.Tubinakere, Mandya. Karnataka, India

Abstract

Nutrition of pre-school children is of top importance because the foundation for lifetime health, strength and knowledgeable energy is laid during this period. The number of children suffering from malnutrition was very significant in the State. As a result of findings from the survey Comprehensive nutrition supplement programme has been implemented in 2012 to improve the nutrition status of pre-school children aged 0-6 years, pregnant and lactating women.

Objectives of the study were to examine the consequences of comprehensive nutrition supplement Programme of Karnataka state and to analyze the prevalence of malnutrition among Anganwadi children after five years of successive implementation of supplement programme. The present Study has focused all 30 districts of Karnataka at macro level. The reference period of the study was 2012-2016. Statistical tools like paired t test is used to examine the changes before and after the implementation of the programme. Statistical results were obtained by using SPSS.

Results and conclusions: Comprehensive Nutrition Supplement Programme has improved the nutritional status of children irrespective of age and gender by reducing the prevalence of underweight of children in Karnataka. The number of normal children has significantly increased and the mean number of underweight children has significantly reduced.

Introduction

Nutrition of pre-school children is of top importance because the foundation for lifetime health, strength and knowledgeable energy is laid during this period. India has achieved phenomenal economic progress in the last three decades, but is still on the task to improve the health status of its population on similar terms. Over the last seven decades, successive five-year plans have laid down policies and multi-sectorial strategies to combat nutrition-related public health problems and improve the nutritional and health status of the population. Although India has not yet overcome the problems of poverty, under-nutrition, over-nutrition and obesity have emerged as public health problems over the last two decades. The magnitude of these problems varies among States and socio-economic sections and between urban and rural areas.

Though Karnataka is known for its high growth of GDP, the State is facing serious threats, especially in the field of nutritional status among women and pre-school children. This is also highlighted by various national surveys. As per the observations of the committee appointed by the high court there is a widespread prevalence of malnutrition across state.

Child malnutrition is a huge problem in Karnataka. Malnutrition in Karnataka has led to high levels of infant, child and maternal mortality, anemia and other micronutrient deficiencies¹. The number of children suffering from malnutrition was very significant in the State. The State's share in the total number of stunted children in India is 2.9%². This is also evidenced by various NFHS rounds and District level household surveys.

According to the information gathered from Department of Women And Child development, Government of Karnataka which is supervising ICDS programme implementation, totally 32,47,875 Anganwadi preschool children were weighted in the month of December-2016, out of which 16,49,824 are boys and 15,98,051 are girls. Out of these weighted children, about 78.32% boys and 77.80% of girls had normal status, 21.27% boys and 21.67% were moderately underweight, 0.41% of boys and 0.51% of girls were severely underweight. However, there is a marginal increase in the proportion of normal children which stands at 76.54 % and marginal decrease in moderately and severely malnourished children with 22.88% and 0.58% respectively³. NFHS-4 survey reveals that more than one in three(34.06%) children were stunted, more than one fourth children wasted, more than one in three children(35.2%) were underweighted. Two out of three children (60.9%) were anemic in Karnataka.

Nutrition interventions are the best investment for ensuring healthy future generations, on which robust and growing economies can be built⁴. The Integrated Child Development Services (ICDS) Scheme was launched in 1975 with the objectives (i) to improve the nutritional and health status of children in the age-group 0-6 years;(ii) to lay the foundation for proper psychological, physical and social development of the child; (iii) to reduce the incidence of mortality, morbidity, malnutrition and school dropout; (iv) to achieve effective co-ordination of policy and implementation amongst the various departments to promote child development; and (v) to enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.

¹Stacey May Comber et al (2015) Food Security in Karnataka: Paradoxes of Performance. The Institute for Social and Economic Change, Bangalore.

²India Health Report on Nutrition-2015.

³Karnataka Economic Survey.2015-16.

⁴Wfp.org (2014) Targeted Public Distribution System Nutritional Effectiveness, world food programme.

Keeping in view the vision that future of India is the future of the children, the Department is laying greater emphasis and making, well deserved concrete efforts in the implementation of all existing Government policies and programmes for the welfare and development of children which is an investment in itself, for their overall socio economic growth. The Integrated Child Development Services Scheme was started in Karnataka on 2nd October 1975 with a pilot project at T.Narasipura in Mysore District with just 100 Anganwadi Centres. Since then, the programme has expanded to all the revenue Taluks in the state. The welfare of pregnant women, nursing mothers, adolescent girls and children below 6 years has acquired a prime place in the programme. The welfare of pregnant women, nursing mothers, adolescent girls and children below 6 years has acquired a prime place in the *programme*.

Background of Comprehensive Nutrition Supplement Programme

After the media exposure and court intervention state government took up the nutritional status of pre-school children as well as pregnant and lactating women issue very utterly. A detailed survey was conducted in the month of June-2012 in all over the state in Karnataka. As a result of findings from the survey Comprehensive nutrition supplement programme has been implemented in July-2012 to improve the nutrition status of pre-school children aged 0-6 years, pregnant and lactating women. Government has changed its course of action and working nature of Anganwadi centres in the State nutritious food distribution to pregnant and lactating women started all over the State. Vigorous quantitative and qualitative monitoring and day to day observation of preschool children started in Anganwadi centres. It was decided to measure the weight of every child quite regularly and to record it properly. The Karnataka Nutrition Mission (KNM) was established and it aimed to eradicate the problem of malnutrition in the State in the shortest possible time by introducing innovative strategic changes. The Mission will specifically target children between 0- 6 years to reduce Underweight among children, adolescent girls and women in the shortest possible time, by following the inter-generational, lifecycle approach. The supplement programme has helped these underweight children to gain weight, resulting in improvement of their health⁵.

Objectives of the study

1. To examine the consequences of comprehensive nutrition supplement Programme of Karnataka state
2. To analyze the prevalence of malnutrition among Anganwadi children after five years of successive implementation of supplement programme.

Data source and Methodology

The present study was based on secondary data which were collected from Department of Women and Children.

⁵ Puttaraju and DR.UMA.H.R.(2015) Nutritional status of Anganwadi children: An assessment of government intervention in Mysore, district of Karnataka, India. International Journal in Management and Social Science(IJMSS), Vol.03 Issue-05, (May, 2015) ISSN: 2321-1784.

Scope of the study

The present Study has focused all 30 districts of Karnataka at macro level. The reference period of the study was 2012-2016. This reference period was important because of several reasons. Karnataka Nutrition Mission was established with the objective of eradicating malnutrition among children, adolescent girls and women in the shortest possible time and this led to the implementation of Comprehensive Nutrition Supplement Programme in July 2012. The Government changed its policy of food pattern to children with introduction of nutritious food like egg and milk to children and pulses cereals to pregnant and lactating women started all over the State. Vigorous quantitative and qualitative monitoring and day to day observation of working of the nature of anganwadis was completely changed. Five years would be better period for the success and failure of the programme.

Statistical tools used

For the data analysis statistical tools like paired t test is used to examine the changes before and after the implementation of the programme. Statistical results were obtained by using SPSS.

Region wise Assessment of Nutritional Status of Anganwadi children

Looking at the change in underweight levels in Karnataka between the period 2012 and 2016, the percentage of underweight children decreased from 37% to 22.5 % in 0-3 years of age and 39% to 25% in 3-6 years of age.

Table.1

Changes in the prevalence of malnutrition between July -12 and December-2016

	Moderately malnourished				Severely malnourished			
	Boys-12	Boys-16	Girls-12	Girls-16	Boys-12	Boys-16	Girls-12	Girls-16
Districts/Divisions	%	%	%	%	%	%	%	%
Bagalkot	38.09	25.78	38.9	25.64	1.8	0.29	2.18	0.31
Belgaum	37.86	27.16	38.24	27.28	1.36	0.4	1.9	0.5
Bijapur	36.84	32.58	36.45	32.63	1.82	0.34	2.21	0.4
Dharwad	34	26.19	35.08	26.44	2.65	1.01	3.61	1.23
Gadag	40.14	33.38	38.67	32.29	3.46	0.76	4.39	0.96
Haveri	35.34	26.45	35.38	26.07	2.4	0.51	2.98	0.76
Uttar Kannada	21.53	13.18	23.05	14.6	0.67	0.33	0.99	0.4
Belagavi division	34.82	26.38	35.11	26.42	2.02	0.52	2.61	0.65
Bellary	37.73	28.55	38.14	30.79	2.48	0.33	3.34	0.47
Bidar	43.87	27.73	42.14	29.3	0.55	0.29	0.6	0.38
Gulbarga	39.63	19.88	38.98	19.78	1.6	0.67	1.94	0.71
Yadgir	31.34	31.99	31.67	32.31	1.17	0.65	1.43	0.72
Koppal	43.9	30.72	43.79	31.5	3.85	1.08	5.06	1.47

Raichur	40.34	29.62	40.66	29.7	2.73	0.73	3.51	0.81
Hyderabad Karnataka	39.47	28.08	39.23	28.89	2.06	0.62	2.65	0.76
Bangalore Urban	17.95	9.71	18.67	9.72	0.84	0.21	1.1	0.2
Bangalore Rural	21.81	11.75	21.25	12.4	0.97	0.23	1.04	0.36
Chikkballapura	26.58	11.24	27.06	11.58	1.2	0.27	1.44	0.35
Chitradurga	28.38	19.54	29.4	20.45	2.34	0.51	2.72	0.66
Davanagere	26.26	20.6	27.3	20.89	1.55	0.29	2.1	0.39
Kolara	33.22	15.49	31.87	16.25	0.73	0.15	0.94	0.22
Ramanagar	15.47	8.78	16.56	9.39	0.68	0.3	0.8	0.28
Shimoga	20.89	10.37	21.19	10.92	1.29	0.31	1.58	0.34
Tumkur	19.36	11.61	19.55	11.06	0.85	0.2	1.01	0.31
Bangalore division	23.32	13.23	23.65	13.63	1.16	0.27	1.41	0.35
Chamarajanagara	27.99	16.15	28.2	17.32	0.86	0.24	1.29	0.29
Chikmagalur	21.54	12	22.19	11.88	0.96	0.37	1.23	0.42
Dakshina Kannada	17.27	9.91	18.26	10.18	0.8	0.07	0.96	0.09
Hassan	24.54	12.41	23.1	12.56	0.48	0.12	0.55	0.21
Kodagu	18.41	13.86	19.3	14.84	0.64	0.39	0.87	0.4
Mandya	19.44	7.8	19.96	8.55	0.61	0.17	0.81	0.23
Mysore	26.21	14	25.28	14.8	0.88	0.2	1.1	0.22
Udupi	10.91	7.17	11.77	7.66	0.53	0.22	0.75	0.26
Mysore division	20.79	11.66	21.00	12.22	0.72	0.22	0.94	0.26
Karnataka	31.66	21.27	31.66	21.67	1.54	0.41	1.97	0.51

Source: Department of Women and Child Development, GOK,(2012-2016).

Table 1 demonstrates the changes in levels of malnutrition among children between 2012 and 2016 in Karnataka.

Hyderabad Karnataka region: six districts are in the region, this region is considered as the most backward and underdeveloped region of the state. N.K.Patil committee on malnutrition pointed out that this region had the highest number of underweight children in the state. Five year after the implementation of the programme; these districts continue to occupy the first place as far as the prevalence of the malnutrition. Though the programme has been very successful in reducing malnutrition, the ranking of the region remains unchanged.

Belagavi region

There are seven districts in the region, compared to Hyderabad Karnataka the prevalence of malnutrition is lesser in Belagavi division. After the implementation of the programme percentage of malnourished children has reduced from 36.84 % to 26.9 % in boys and 37.72% to 27.07% in girls. Districts like Bagalkot, Haveri, Uttara Kannada, Gadag are better developed, but the progress in the nutritional status of children looks not satisfactory.

Bangalore Region

There are nine districts in the region; this region is considered to be the most developed region of the state. Most urbanized and industrialized districts like Bangalore urban, Bangalore rural are in the region. The prevalence of malnutrition among boys has been reduced from 24.48% to 13.5% among boys and 25.06% to 13.98% in girls. Compared to other three divisions Bangalore has lowest prevalence of malnourished children.

Mysuru Region

Mysore, Mandya, Chamarajanagara, Hassan, Kodagu, Udupi, Dakshina Kannada districts are in Mysuru region. All these districts have their own history of development; districts like Dakshina Kannada and Udupi are known for highest literacy rate, Kodagu district and Chikkamagalore districts are known for coffee plantation. The prevalence of malnutrition has decreased rapidly by annually more than two percentages per year during 2012 and 2016.

Effect of Supplementary Programme: An empirical analysis

To examine the effect and effectiveness of comprehensive nutrition supplement programme following hypothesis is framed.

H₀: There is no noticeable change in the prevalence of malnutrition after implementation of the programme.

H₁: There are noticeable changes in the prevalence of malnutrition after implementation of the programme.

To examine the effects of the programme the prevalence of malnutrition before and after the programme is analyzed. Paired t-test is done for 0-3 and 3-6 years age boys and girls separately.

Table 4.22**Summary of Paired t test result**

	Mean before	Mean after	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
0-5 Year Children							
0-5 years Normal Boys	77589.871	105521.87	73049.119	13120.009	-2.129	30	0.042**
0-5 years Normal Girls	77039.29	101811.74	63561.309	11415.948	-2.17	30	0.038**
0-5 years Moderately underweight Boys	18996.767	14933.433	6463.4216	1180.0539	3.443	29	0.002***
0-5 years Moderately underweight Girls	18985.2	14834.6	6254.0565	1141.8293	3.635	29	0.001***
0-5 years severely underweight Boys	926.4333	289.3333	617.66213	112.76916	5.65	29	0.000***
0-5 years severely underweight Girls	1182.6667	365.1333	807.13263	147.36158	5.548	29	0.000***
0-3 Years Children							
0-3 years moderately underweight boys	11768.167	9136.6667	4159.8237	759.47643	3.465	29	0.002***
0-3 year moderately underweight girls	11515.033	8920.5667	4120.455	752.28872	3.449	29	0.002***
0-3 years severely underweight boys	545.9333	152.5667	389.10627	71.04076	5.537	29	0.000***
0-3 years severely underweight girls	668.4	195.3667	499.16126	91.13396	5.191	29	0.000***
3-5 years children							
3-5 years moderately underweight boys	7228.6	5796.7667	2842.0288	518.8811	2.759	29	0.01**
3-5 years moderately underweight girls	7470.1667	5914.0333	2706.6645	494.16707	3.149	29	0.004***
3-5 years severely underweight Boys	380.5	136.7667	232.49916	42.44834	5.742	29	0.000***
3-5 years severely underweight Boys	514.2667	169.7667	313.53466	57.24334	6.018	29	0.000***

Note: **significance at 5%,*** significance at 1%.

Table.2 shows the results of paired t-test of comprehensive nutrition supplement programme on Anganwadi preschool children between 2011 and 2016. The number of normal children has increased, As a result, the prevalence of moderate and severe underweight among children has decreased rapidly in five years from 2012-2016. It bears proof to the fact that the

programme has been highly significant and effective in the age group 0-3 years and 3-5 years. Government efforts have brought down the severity of the problem of underweight among children to some extent. Within the period of five years, the programme has successfully improved the conditions of children. However, "Big Effort" is needed to come out of the vicious circle of under-nutrition much.

Table 2 presents summary of paired 't' results of age and gender-wise nutritional status after implementation of Comprehensive Nutrition Supplement Programme in 2012. It is observed that Comprehensive Nutrition Supplement Programme has improved the nutritional status of children irrespective of age and gender by reducing the prevalence of underweight of children in Karnataka. The number of normal children has significantly increased and the mean number of underweight children has significantly reduced.

The mean of 0-5 years normal children is statistically significant at 5 % level of significance for both boys and girls ($p=0.042&0.038$). Similarly, the mean of moderately underweight of 0-3 years boys and girls is statistically significant at 5 % level in the State, correspondingly reduction in severe underweight is also significant at 1% level ($p=0.000$). On the other hand, the mean moderate and severe underweight of 3-5 years boys and girls also is reduced and it is significant at 1% level. Compared to boys, the mean value of girls implies that the mean underweight of girls is still higher than boys aged between 3 years and 5 years. Thus it can be concluded that Comprehensive Nutrition Supplement Programme has drastically brought down the mean underweight of children irrespective of age and gender in Karnataka state.

Results show significant changes in the prevalence after the implementation of the programme. Hence the null hypothesis H_0 : *There is no noticeable change in the prevalence of malnutrition after implementation of the programme. **Rejected.***

Conclusion

It can be inferred from the results that there is a considerable improvement in the nutritional status of the children belonging to different regions after the implementation of the programme. It bears the proof to the fact that the comprehensive supplement programme has been highly significant and effective in the State in all the districts of all the regions in the age group of 0-3 years and 3-5 years of age and results in improvement of their health.

Reference:

1. Antony, G. M., & Laxmaiah, A(2008).Human development, poverty, health & nutrition situation in India. *Indian Journal of Medical Research*,128(2), 198.
2. Choudhury, K. K., Hanifi, M. A., Rasheed, S.,& Bhuiya, A. (2000) Gender inequality and severe malnutrition among children in a remote rural area of Bangladesh. *Journal of Health, Population and Nutrition*, 123-130.
3. Christopher et al (2013). Children's height and weight in rural and urban populations in low-income and middle-income countries: a systematic analysis of population-representative data. *The Lancet Global Health*, 1(5), e300-e309.
4. Deaton, A., & Drèze, J.(2009). Food and nutrition in India: facts and interpretations. *Economic and political weekly*, Vol. 44, No. 7 (Feb. 14 - 20, 2009), pp. 42-65.
5. Directorate of Distance Education (2012) *Research Methodology, Excel book publishers (p)Ltd, phagwara.*

6. Florentini, C. (2010). Economic and cultural determinants of child malnutrition in India: unraveling the " South Asian Enigma".
7. Fotso, J. C. (2006). Child health inequities in developing countries: differences across urban and rural areas. *International journal for equity in health*, 5(1), 9.
8. Harsh Mander (2012) Ash in the Belly. SAGE Publications India
9. Kanjilal, B., Mazumdar, P. G., Mukherjee, M., & Rahman, M. H. (2010). Nutritional Status of children in India: household socio-economic condition as the contextual determinant. *International Journal for equity in Health*, 9(1), 19
10. Mittal, A., Singh, J., & Ahluwalia, S. K. (2007) Effect of maternal factors on nutritional status of 1-5-year-old children in urban slum population. *Indian Journal of Community Medicine*, 32(4), 264.
11. N.K.Patil committee on prevention of malnutrition in Karnataka(2012)
12. Sukhadeo Thorat and Nidhi Sadana Sabharwal, INDIA HEALTH BEAT,Volume 5, Number 5.
13. [Swaroop Kumar Sahu](#) et al (2015) Malnutrition among under-five children in India and strategies for control. [J Nat Sci Biol Med](#). 2015 Jan-Jun; 6(1): 18–23.
14. Veena S Rao (2016) Under-nutrition in India – A Forgotten National Nutrition Policy without a National Programme. *Proc Indian Natn Sci Acad* 82 No. 5 December 2016 pp. 1367-1379.