

Nutritional Profile of Children (0-5years) in the Service Villages of Gandhigram Rural Institute

K.S.PUSHPA¹ and D.JANCY RANI²

¹Department of Home science, Gandhigram Rural Institute, Deemed University, Gandhigram. Dindigul (dt), Tamil Nadu. India.

²Department of Nutrition & Dietetics, Standard Fire Works Rajaratinam College for Women, Sivakasi, Tamil Nadu. India.

<http://dx.doi.org/10.12944/CRNFSJ.3.1.09>

(Received: December 05, 2014; Accepted: March 30, 2015)

ABSTRACT

India is home to largest child population in the world with around 157.86 million children, constituting 15.42 percent of India's population, who are below the age of 6 years. More than 60 percent of children living in South Asia are malnourished. In this study, socio economic background of children, age at marriage of parents, pregnancy related complications and health and nutritional status of children are focused. Door to door survey was conducted in 13 service villages of GRI. The sample frame consists of 538 children. A self structured interview schedule was used to collect the data. Interview method was chosen for collecting data from the mothers of children. The general objective of the study has to prepare nutritional profile of children in the age group of (0-5 years) in the service villages of Gandhigram Rural Institute Tamil Nadu. Out of 538 children 50.2 percent boys than girls population constituted 49.8 percent. Over weight was found among 8.6 percent of children. As per mid upper circumference, 87.2 percent of children were normal, 10.4 percent of children were in the stage of underweight and risk of malnutrition, 2.4 percent of children had severe malnutrition. It is also seen that the nutrient intake of calcium and minerals by the selected children were below the RDA. Intake of calcium and iron among 0-1 year children was slightly excess of RDA by 0.04 and 0.02 percent. The nutritional status of children below two years in rural areas is yet to be improved as one out of ten children are malnutrition. This condition needs to be changed by the better implementation of maternal and child health programmes.

Key words: Malnutrition, RDA, Balwadi, Nutritional status.

INTRODUCTION

India is home to largest child population in the world with around 157.86 million children, constituting 15.42 percent of India's population, who are below the age of 6 years. A significant proportion of these children live in low/poor economic and social environment, which predisposes them to poor nutrition and impedes their physical and mental development. (<http://wcd.nic.in/icds.htm>).

Children are in a constant phase of development. Their body is in a phase of constant wear-tear and repair, their brain is developing and bones are growing. These growing children require

constant supplementation of calories, proteins and micronutrient to keep the pace of increased demands of the body, since childhood is the most vulnerable phase in the life of human being. Nutritional inadequate will result in the hampering of the development of the body. If this nutritional inadequacy is continued for a long periods of time it results in the growth faltering manifested in the form of low weight, small height and low IQ. Future of the country is determined by the growing generation of the country. It is the health status of children of any country that represents the health status of people of that country. Since this growing generation is going to be failure productive citizens, they should be healthy enough to make use of the full potential of their

productive age. Scientific evidence has shown that of beyond the age of 2-3 years, the effects of chronic malnutrition are irreversible (Goel *et al*, 2007).

The children of today are the future of tomorrow; this powerful statement assumes special significance in our context as children (0-14 years) comprise one third of the total population in the country. This reminds us of the enormous responsibility that we have to mould and shape their present conditions in the possible way. (Anant, 2012).

Child malnutrition is a wide spread public health problem having international consequences because good nutrition is an essential determinant for their well-being. The most neglected form of human deprivation is malnutrition particularly among preschool children. India is one of the few countries in the world where poor nutritional status among preschool children is detrimental to their health outcome. Nutritional status indicators like wasting, stunting, low birth weights, breast feed, availability and vitamin – A deficiency are also still high in India compared to the USA and China. Child malnutrition reflects a number of intermediately process such as household access to food, access to health service and caring practices.

For proper development of children, nutrition plays a crucial factor in the early years of life. Under nutrition is mainly responsible for dietary inadequacy in relation to children's needs. The highest rate of under – nutrition in the world is seen in Asia (National Institute of Nutrition, 2003).

Malnutrition rates increase between 6 and 18 months, the period of complementary feeding. Inappropriate practices such as the delayed introduction of complementary foods, low energy and nutrient density of foods offered, feeding in small amounts at meals and food restriction due to cultural beliefs are common even in parts of South East Asia. (Bhandari *et al*, 2003).

Nutrition is widely recognized as a high priority in global health and has become the focus of various intervention strategies. Of the world's undernourished children, 80 percent live in twenty countries, concentrated among the regions of sub-

Saharan Africa and South East Asia. India provides an extreme example, with approximately 61 million children suffering from stunted growth. India alone represents 34 percent of the world's stunted children. (Bryce. J. *et al*, 2008).

The 3rd National Family health Survey findings showed that (45 percent) less than three year old children were malnourished. If this continues, India would be raising a generation which is debilitated and unable to contribute effectively to the productivity of the country. To tackle the problem of malnutrition and the ill health of mothers and children, the Government of India has launched the Integrated Child Development Services (ICDS) Programme (National Family health Survey-III, 2005-2006).

Child malnutrition is the single biggest contributor to under-five mortality due to greater susceptibility to infections and slow recovery from illness. Misconception prevalent in the present time is the unavailability of the enough food. Between 6-8 months, young child requires only 200-300 kcal food to maintain normal growth and development; but because of insufficient knowledge of parents about feeding practices that don't provide enough food to their children leading to faltering of growth and consequently illness and death of child (Avachat *et al*, 2009).

METHODOLOGY

Statement of the problem

The study titled "Nutritional profile of children (0-5years) in the service villages of Gandhigram Rural Institute is descriptive in nature. It aims at assessing the nutritional status of children in the age group of 0-5 years and to know the prevalence of malnutrition in the service villages of GRI.

Area of the Study

The GRI has established Balwadies in 13 different villages. These 13 villages are known as service villages of GRI. Kondamanayakkanpatti, Vellaiyampatti, Kannimanuthu, Kotturavampatti, Agaram, Ranagappanur, S.Vadipatti, Chadhirapatti, Achampatti, Valaiyapatti, Ulagampatti, k.pudhurand Chettiyapatti are the service villages of GRI.

Selection of the sample

Door to door survey was conducted in 13 service villages, to know the number of children in the age group of 0-5 years. After the survey, all children in the age group of 0-5 year were selected for the study. The sample frame consists of 538 children in the age group of 0-5 years from the selected 13 villages.

Tools for data collection

An interview schedule was prepared. The interview schedule contained general information on personal and family back ground of children, health status of mother and child anthropometry, food frequency and clinical status of children .The interview schedule was prepared in local language to have free interaction with the mother.

Assessment of nutritional status

Anthropometric measurements of the selected children.

Anthropometry means measurement of certain physical parameters of the human body and most frequently used tool to assess the nutritional status of individuals or community. Anthropometric measurements of selected children were obtained by adopting the methods describe below.

Height

The children below the age of two years who cannot stand properly, Recruitment length (crow heel length) should be measured with infantometer. The legs need to be held straight and firm with the feet touching the sliding board. Infantometer available with village Health nurse was used for measuring the height of the children.

The 2-5 years age group children were children were asked to stand barefoot against a flat wall which has been marked from 100-180cm with 10cm intervals using their head back, shoulder and heels touched the wall and use a wooden scale (30cm) to place on head while measuring. Height of the respondents recorded and expressed in centimeter (cm).

Weight

Body weight is the most widely used and the sensitive and simple reproducible anthropometric

measurements for the evaluation of nutritional status of young children for measuring body weight, beam or level actuated scales with an accuracy of 50-100g are preferred. Weighing balance was checked zero error before measuring .Then the subjects were to stand straight on the weighing balance without foot wears .The weight of the individuals were taken with a precision of 100gm and expressed the results in kilogram(kg).

Mid upper arm circumference

Mid arm circumference is recognized to indicate the status of muscle development. The device advocated by IAPEN (Indian Association for Parenteral and Enteral Nutrition) Pocket toolkit was used for measuring the mid upper arm circumference. The device is given in Appendix-II.

Head and chest circumference

Head size relates mainly to the size of brain which increases quite rapidly during infancy. The chest in a normally nourished child grows faster than head during the second and third year of life. As a result, the chest circumference overtakes head circumference by about one year of life. In protein Energy Malnutrition due to poor growth of chest, the head circumference may remain to be higher than the chest even at age of 2.5 to 3 years. Flexible fiber glass tape is used. The chest circumference is taken at the nipple level preferably in mid inspiration. The head circumference is measured passing the round the head over the supraorbital ridges of the frontal bone in front and the most protruding point of the occiput on the back of the head. In the present study, head circumference was not measured.

Body Mass Index

To know the prevalence of malnutrition the weight of the children was plotted in the growth chart which is recommended by WHO for ICDS centers. The growth chart used for the study is given in Appendix-III.

Growth indicators Degree of Malnutrition

Good	Normal.
Danger	Below 2SD to 3SD
Very Danger	Below -3SD.

Source: (WHO-1999).

Dietary Survey

A diet survey provides information about intake patterns of specific foods consumed and estimated nutrient intakes. It indicates relative dietary inadequacies, which is helpful in planning health education activities and changes needed in the agriculture and food production industries. Most of the time, the surveys are carried out for 7-10 days. If needed in different seasons survey can be repeated.

Recall Method

24 hours recall method was followed for assessing the dietary status of children. Recall method is useful in carrying out a diet for a number of people in a short period of time. Enquiries are made about the nature and quantity of foods eaten during the previous 24 to 12 hours. Properly formulated oral questionnaire method can give reliable result on diet survey. (Park.2011).

Food frequency method

The children were given the list of food items and mother were asked to mention the frequency of consumption by the children in the age group of 2-5 years. It is an inexpensive, more representative

and easy to use tool to assess dietary pattern of an individual.

Collection of Data

Prior to data collection, the investigator established rapport with mothers. All the mothers were interviewed in their home itself. The health condition of children were observed at the time of data collection. The data gathered were cross checked with the information available in the Anganwadi.

RESULTS AND DISCUSSION

As shown in Table 1, the children selected for the study were in the age group of 0-5 years. Among them 15.7 percent of them were in the age group of 0-1 years. Those who were in the age group of 1-2 years constituted 21.3 percent and 17.1 percent of them were in the age group of 2-3 years. 21 percent of them were in the age group of 3-4 years and 24.7 percent of them were in the age group of 4-5 years.

As shown in Table – 2, 60.3 percent of male children in the age group of 0-2 years and 29.9 percent of girls were from small sized families, 42.7 percent of children were from medium sized families with 3-5 members. One fourth of the families were larger in size.

The type of family shows that 34.1 percent of the children were from nuclear family. It shows that most of the children come from the joint family.

The Table 3 shows the height, weight of the male and female children against the standard height and weight as recommended by NCHS. In 0-2 years age group, the mean weight of male children was lower than the NCHS standard. All children showed

Table 1: Age and Sex wise Distribution of the Children

Age in Years	Children					
	Male		Female		Total	
	No.	%	No.	%	No.	%
0-1	39	14.4	46	17.1	85	15.7
1-2	54	20.0	61	22.7	115	21.3
2-3	47	21.1	45	16.7	92	17.1
3-4	59	21.8	54	20.1	113	21.0
4-5	71	24.2	62	23.1	133	24.7
Total	270	100.0	268	100.0	538	100.0

Table 2: Distribution of the Children by their Family Variables

Variables	0-2 years				2-5 years				Total	
	Male		Female		Male		Female		No.	%
	No.	%	No.	%	No.	%	No.	%		
Family Size										
1-2	56	60.3	32	29.9	60	33.8	20	12.5	183	34.1
3-5	17	18.2	45	42.0	88	49.7	88	54.5	230	42.7

stunted growth. The mean weight of male children of 2-5 years was higher than the NCHS Standard. The same observation could be found in the height also. The mean weight of female children in the age group of 0-2 years was lower than the NCHS standard. In the age group of 2-5 years, the mean weight was higher than the standard. Girls in the age group of 0-1 years and 2-5 years had registered higher height compared to NCHS standard. Thus the analysis

reveals that children are given balanced food by their mother.

Table – 4 shows the mid upper arm circumference of children. As per mid upper circumference, 87.2 percent of children were normal, 10.4 percent of children were in the stage of underweight and risk of malnutrition, 2.4 percent of children had severe malnutrition. Only 12.8 percent

Table 3: Distribution of the Mean Weight (Kg.) and Height (cm) of Children

Age in Years	No. of Male	Children				No. of Female	Children			
		Weight (Kg.)		Height (cm)			Weight (Kg.)		Height (cm)	
		NCHS Standard	Present Study	NCHS Standard	Present Study		NCHS Standard	Present Study	NCHS Standard	Present Study
0 - 1	39	10.2	8.6	76.1	65.2	46	9.5	8.7	74.3	76.9
1 - 2	54	12.3	11.2	85.6	86.4	61	11.8	10.2	84.5	79.3
2 - 3	47	15.7	16.4	99.1	102.1	45	14.1	15.6	93.9	94.7
3 - 4	59	16.9	16.2	102.9	101.6	54	16.0	16.4	101.6	102.4
4 - 5	71	18.7	18.9	106.6	109.5	62	17	17.2	108.4	109.3

Table 4: Nutritional Status of the Children as per the Mid Upper Arm Circumference

Nutritional	Children										
	0-2 years					2-5 years					Total
	Male		Female		Male		Female				
	No.	%	No.	%	No.	%	No.	%			
0.0– 11.50 cm(severe malnutrition)	2	2.1	7	6.6	4	2.2	—	—	13	2.4	
11.50 12.50 cm(Under weight and risk of malnutrition)	15	16.2	15	14.0	8	4.6	18	11.2	56	10.4	
> 12.50cm (normal)	76	81.7	85	79.4	165	93.2	143	88.8	469	87.2	
Total	93	100.0	107	100.0	177	100.0	161	100.0	538	100.0	

Table 5: Nutritional Status of the Children as per Growth Charts

Age in years	Children					
	Male (N=270)			Female (N=268)		
	Obese	Normal	Below 2 SD	Obese	Normal	Below 2 SD
0 - 1	9	22	8	3	39	4
1 - 2	4	40	10	2	54	5
2 - 3	2	39	6	3	40	7
3 - 4	2	52	5	1	46	5
4 - 5	3	64	4	5	47	7
Total	20	217	33	14	226	28

Table 6: Distribution of the Clinical Status of Selected Children

Clinical Examination	Children							
	0-2 years				2-5 years			
	Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%
No. of Subject without symptoms	82	88.1	89	83.1	96	82.1	138	85.7
No. of subjects with symptoms	11	11.9	18	16.9	21	17.9	23	14.3
Symptoms Observed								
Poor musculature with gross muscular wasting	—	—	3	2.8	2	1.7	1	0.6
Dry or rough skin	2	2.1	2	1.8	1	0.8	3	1.8
Discolourisation of Hair	—	—	5	4.6	4	3.4	3	1.8
Thin and weak hair	1	1.0	2	1.8	7	5.9	4	2.4
Red or raw Tongue	2	2.1	3	2.8	3	2.5	2	1.2
Angular Stomatities	5	5.7	1	0.9	1	0.8	3	1.8
Nutritional oedema	—	—	—	—	2	1.7	5	1.8
Scurvy	—	—	—	—	—	—	—	—
Piegeon chest	1	1.0	2	1.8	1	0.8	2	1.2

* Mutual Responses

of children were found to be malnourished. The analysis reveals that based on themed upper arm circumference of children 12.8 percent were severely malnourished.

The weight of the children was plotted in growth chart. Based on the record, the table – 3 was framed. Among male children, 80.3 percent of male children and 94.3 percent of female children were normal. 7.4 percent of male and 6.1 percent of female children were obese. 12.2 percent of male children and 10.4 percent of female children were found under the category of below 2 SD. They are in 'danger zone'. They may fall in to malnutrition category at any time Dietary intervention is needed for 17.6 percent children to improve their health condition

Table – 5 present the signs and symptoms of nutritional deficiency observed among the selected children. 86.5 percent of the children were healthy and free from any clinical signs and deficiency. 1.3 percent of the children showed poor musculature with gross musculature symptoms wasting. 1.4 percent of the children showed dry or rough skin. Discoloration of hair shows that 2.2 percent and Red or raw

tongue was observed in 1.8 percent of children. 1.1 percent of children had the pigeon chest. All these clinical deficiency signs and symptoms directly reflect the nutritional inadequacy of the food served in the selected service institution. To improve the health status of children, anganwadi has to play an important role. With dietary intervention, the health condition of the children could be improved.

CONCLUSION

A total of 538 children in the age group of 0-5 years were selected for the study. Among them 37.2 percent of them were in the age group of 0-2 years and 62.8 percent of them were in the age group of 2 – 5 years respectively. It was also found that 17.5 percent of male and 19.8 percent of female were found in the category of 0-2 years and 32.8 percent of male and 29.9 percent of female were found in the category of 2-5 years respectively. The number of girls children is less compared with boys.

The type of family shows that 34.1 percent of the children were from nuclear family. It shows that most of the children come from the joint family.

Majority of the children were from medium sized families. It is also found that male children below two years were from nuclear families than the children of other age group.

As per mid upper circumference, 87.2 percent of children were normal, 10.4 percent of children were in the stage of underweight and risk of malnutrition, 2.4 percent of children had severe malnutrition. Only 12.8 percent of children were found to be malnourished. The analysis reveals that based on themed upper arm circumference of children 12.8 percent were severely malnourished.

Among male children, 80.3 percent of male children and 94.3 percent of female children were normal. 7.4 percent of male and 6.1 percent of female children were obese. 12.2 percent of male children and 10.4 percent of female children were found under the category of below 2 SD. They are in 'danger zone'.

Dietary intervention is needed for 17.6 percent children to improve their health condition.

In 0-2 years age group, the mean weight of male children was lower than the NCHS standard. All children showed stunted growth. The mean weight of male children of 2-5 years was higher than the NCHS Standard. The same observation could be

found in the height also. The mean weight of female children in the age group of 0-2 years was lower than the NCHS standard.

Eighty seven percent of the children were healthy and free from any clinical signs and deficiency. 1.3 percent of the children showed poor musculature with gross musculature symptoms wasting. 1.4 percent of the children showed dry or rough skin.

Red or raw tongue was observed in 1.8 percent of children. 1.1 percent of children had the pigeon chest. All these clinical deficiency signs and symptoms directly reflect the nutritional inadequacy of the food served in the selected service institution.

The first six years of life is called as the foundation years. Good stimulation and proper nutrition during these periods are essential for developing them into healthy individuals. The study focus on the nutritional profile of children in the age group of (0-5 years) in the service villages of Gandhigram Rural Institute. The nutritional status of children below two years in rural areas is yet to be improved as one out of ten children are malnutrition. This condition needs to be changed by the better implementation of maternal and child health programmes.

REFERENCES

1. Ankita.m. Indian Human Development. NewDelhi; Printed in India at Ramko press pvt.ltd (2011).
2. Gopaln.G., Ramasastrri.B.v., Balasubramanian. S. C. Recommended Dietary Allowances For Indians. Hyderabad; ICMR (1989).
3. Park.K. Preventive and social Medicine, Jabalpur: BanarsidasBhanot Publishers (1977).
4. Pererla.S.M., Protein energy malnutrition . Clinical Nutrition of the young child. New york:Reven press Ltd (2001).
5. Krishnaswamy.K. Diet and nutrition situation in Rural India .Oxford and IBH publishing co.Pvt.Ltd (2004).
6. Kamala krishnaswamy.,andSasikeran.B. Dietary Guidelines for Indians(2nded), Hyderabad. National Institute of Nutrition (2011).
7. Shantighosh. The feeding and care of Infants and Young children. New Delhi: UNICEF (1976).
8. Arachat.s.,Phalke.d. Epidemiological study of malnutrition among under five children in a section of rural area. *IndianJournal of community medicine*, 4(2);20-22 (2009).
9. Anuratha.D.,sanjeer.D.,Utsuk.k. Prevalance and Determinants of undernutrition and its Trends among Pre-school children of Maharashtra state. *Indian Journal of Community Medicine*, 33;47-49.
10. Allihaji.M.,allen.S. pediatric review: Management of Severe Malnutrition time for a change?.*Africa Health*, 24: 21-23 (2002).

11. Bhutta.Z.A., Ahmad.T.,Black. R.E., Cousens.S., Dewey.K.,Giugliani. E . Whatworks? Interventions for maternal and child health. *The Lancet*, **382**: 284.275 (2008).
12. Balgir.R.S.,Mural.B.,andDarshp.B. Physical growth,health and nutritional status of the ashramschooltrible children in NorthenOrrisa. *Indian Journal of Nutrition and Dietitics*, **36**: 443-451 (1996).
13. Bhandari.N., Bahl.R., Mazumder.S., Martines.J.Black. R.E., and Bhan.M.k. Effect of community based promotion of exclusive breast feeding on diarrheal illness and growth ,a cluster rendamized controlled Trible. *The Lancet*, **361**: 1418-1423 (2013).
14. Chang.S.y.,Geky.m. Definition and measurement of child malnutrition : Instituteof Nutrition and Food Hygine. *Journal of Preventive Medicine*, **13**(9);240 (2008).
15. Denise.O.S.Luizchrlos. D.A., Victor.E.v., viviance.G.N., Adriana.G.O., Paulo.R.G., Ruben.W.N., and Claudiolone. Nutritional status of preschoolchildren from low income families. *Nutrition Journal*, **56**: 259-268 (2011).
16. Dinesh Kumar.,Goel.N.K.,Mittalpoonam and Mishra Purnima. Inflence of Infant- Feeding practices on Nutritional status of under five children.*Indian Journal of Pediatrics*, **73**(5):417-421 (2006).
17. Enakshi .G.,andSudha .n. Nutritional status ofgrowthflatered children aged 0-6 yearsin Rural RangareddyDistrict. *Journal of Health sciences*, **12**(5);27-32 (2013).
18. Frangillo.E.A.,Deonis.M., Manson.K.M.P. Social Economic and Demographicfactors are associated with Worldwide patterns ofstarting and wasting of children. *Journal of Nutrition*, **127**(4);2302-2309 (1997).
19. Kapur.D.,Sharmal.s.,andAgarwal.K.N. Dietary intake andgrowth pattern of children 9-36 months of age in an Urban slum in Delhi. *Indian Paediatrics*.**42**(7),351-356 (2005).
20. Lamperti.L.M., Walker.C.F.,Noimal.a.,Victoria. C.and Black. R.E. Breastfeeding and the risk for diarrhoeaa morbidity and mortality. *BMC public Health*, **11**(53);s15-s27 (2011).
21. Lakshmi. U.K. Impact of NSS programme on the Nutritional status of Preschool children. *Journal of Nutrition and Dietitics*, **41**(6),16-18. (2004).
22. State World's Children (2012). Retrieved on August 29, 2012 from <http://nutritionfoundationofindiares.in/research8asp>.
23. Centers for Disease Control and Prevention (2005). Measuring and Interpreting Malnutrition and Mortality. Retrieved on January 10, 2013 from <http://www.allindiary.org/pool/resources/wfp-cdc-measuring-malnutritionandmortality.pdf>
24. UNICEF (2009) State of World's Children. Retrieved on January 12, 2013 from www.unicef.org/media-6665 html.
25. Centers for Disease Control and Prevention, (2011). Retrieved on January 15, 2013 from http://www.cdc.gov/impact/micro_nutrients/index.html.