IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 20, Issue 7 Ser.3 (July. 2021), PP 52-57
www.iosrjournals.org

"Study of Nutritional Status of Anganwadi Children under Icds in Rural Field Practice Area of Adichunchanagiri Institute of Medical Sciences"

Dr.Ranjini.G.Naik,Dr.Kumar G M
Department of Paediatrics,Adichunchanagiri Institute of Medical Sciences,B.G.Nagara,Mandya,Karnataka.
Correspondence: Dr.Ranjini.G.Naik

Abstract
Background: *Malnutrition in India remains a predominant risk factor for morbidity and mortality in under five children.To combat malnutrition many community based programmes have been launched.Integrated Childhood Development Services (ICDS) scheme launched in 1975, continues to be India's flagship child welfare programme to meet the nutritional needs of millions of children and a multisectoral strategy for eradicating malnutrition.*
Objectives: *To study the nutritional status of Anganwadi children under ICDS in rural field practice area of Adichunchanagiri Institute of Medical Sciences.*
Methods: *A cross sectional study of 770 Anganwadi children in rural field practice area of Adichunchangiri Institute of Medical Sciences was carried out with simple random sampling method for a period of 12 months from January 2018 to December 2018, to assess the nutritional status of children. Assessment of the nutritional status was done by clinical examination, anthropometry and health records maintained in Anganwadi centres.*
Results: *: Among the 770 children examined, 52.1% were males and 47.9% were females and most of them(57.1%) belonged to 3 to 4 year age group.90.4% were Hindus.50.8% and 28.6% belong to class IV and III socio economic status respectively Overall prevalence of underweight,stunting and wasting was 37.4%,36.82% and 22.52% respectively.*
Conclusion: *The present study shows better nutritional status among children (1-6 years) compared to other similar studies. This may be because of better coverage of Anganwadi centres in the study area and good utilization of services by people from these Anganwadi centres. Among malnourished children,majority of them were mildly malnourished and only a small percentage of children need nutritional modifications.*
Keywords: *Malnutrition,Anganwadi,ICDS,Nutritional status,Anthropometry*

Date of Submission: 24-06-2021 Date of Acceptance: 07-07-2021

I. Introduction

Nutrition plays an important role in physical,mental and emotional development of children. Malnutrition especially in the early years of life can have detrimental effects on the overall development of child.Through precipitating disease and speeding its progression, malnutrition is a leading contributor of infant and child mortality and morbidity[1]According to WHO,around 45% of deaths among children under 5 years of age are linked to undernutrition.The Global Nutrition Report 2018[2],states that among children under five years of age, 150.8 million(22.2%) are stunted, 50.5 million(7.5%) are wasted and 38.3 million(5.6%) are overweight and India holds almost a third of world's burden for stunting.As per National FamilyHealth Survey-4 2015-16 in India 38.4% of children under age five years are stunted, 21 percent are wasted and 35.7 percent are underweight.

To overcome the problems of undernutrition and in pursuance of national policy for children,Government of India decided to start a holistic multicentric programme and launched Integrated Child Development Services(ICDS) Scheme on 2nd Oct 1975[3]. It became one of the world's largest community based programme.The beneficiaries of the scheme are children of age group 0 to 6years,pregnant women,lactating mothers ,women in reproductive age(15-45yrs) and adolescent girls.The services rendered by Anganwadi centres to children between 0 to 6 years of age include non formal pre school,education,nutrition,immunization,regular health check up and referral services.Despite the expansion of the ICDS Scheme to cover most of the children in the country, progress in reducing child malnutrition has been slow[4].To emphasis the importance of effective implementation of ICDS programme and its impact on the nutritional status of children this study was conducted in the Anganwadi's of rural field practice area of A.I.M.S,B.G.Nagara,Mandya District.

OBJECTIVES: To study the nutritional status of Anganwadi children under ICDS in rural field practice area of Adichunchanagiri Institute of Medical Sciences.

II. Materials And Methods

STUDY DESIGN AND DURATION: This community based cross sectional study was conducted in the Anganwadi centres of Rural field practice area of A.I.M.S for a period of one year from January 2018 to December 2018. Approval for the study was taken from Child Development Project Officer (CDPO) ,Nagamangala Taluk,Mandya district.Ethical clearance was taken from Institutional Ethics Committee.

SAMPLING TECHNIQUE: Simple random sampling method was used in the study.There are 3 Rural Health Training Centres(RHTC)which comes under Adichunchanagiri Instittute of Medical Sciences.There were total of 71 Anganwadi centres from 3 RHTC. Out of which 44 Anganwadi centres were selected by simple random sampling method.770 Anganwadi children from the selected Anganwadi centres were included in the study after applying inclusion and exclusion criteria.

STUDY SUBJECTS: The study subjects were 770 children of 1 to 6 years of age from Anganwadi centres, which were selected by simple random sampling.

INCLUSION CRITERIA: Children in the age group of 1 to 6 years (both male and female) enrolled in the Anganwadi centres.

EXCLUSION CRITERIA:1. Children who did not attend Anganwadi regularly(4days a week)
2. Children with preexisting congenital disorders interfering with nutrition

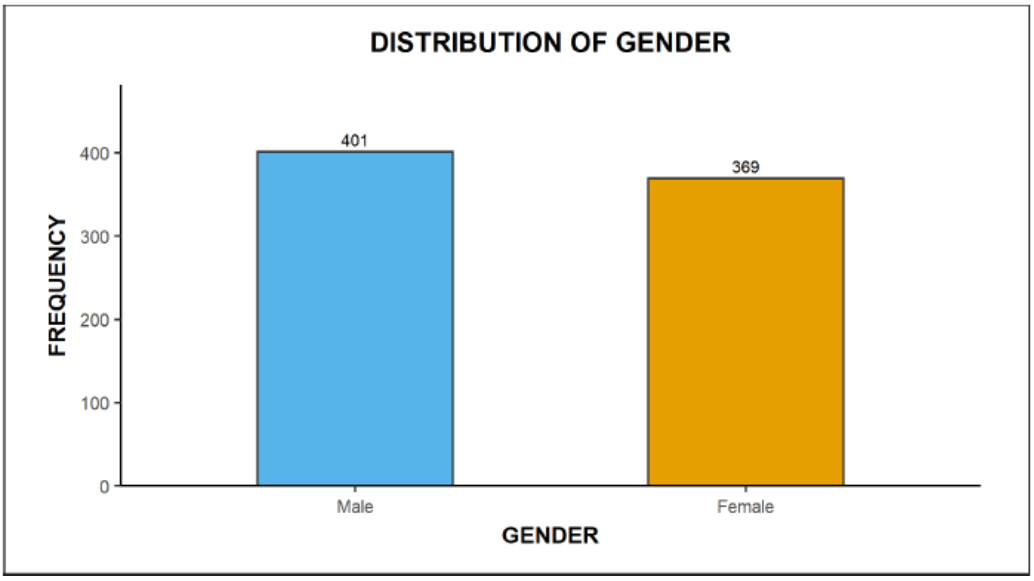
III. Data Collection:

Data regarding personal information of each child was taken from the Anganwadi records including age,religion,parents information(education status and occupation) and socioeconomic status was assessed using Modified B.G.Prasad classification.Data was entered in the pre tested proforma.The method of collection of data wasby -1.By clinical examination. 2. By measuring anthropometry. 3. Health records of each child maintained in Anganwadi centres.Head to toe clinical examination of children was done to look for any micro and macronutrient deficiency,infection or other anomalies. Anthropometric measurements were carried out following standard methods[5].The data included weight,length(<2years of age),height(>2years of age),head circumference,mid upper arm circumference,skin fold thickness. Weight was measured using a weighing machine, an error of +/- 0.1 Kg was considered while measuring weight.Length was measured for children less than 2years using infantometer and height was measured against nonstretchable tape fixed to a vertical wall and an error of +/-0.1 cm was considered.Head circumference and Mid upper arm circumference(MUAC) was measured with a nonstretchable measuring tape.Skin fold thickness was measured using Harpenden calipers.

The nutritional status of children was assessed by measuring weight for age,height for age and weight for height using WHO growth charts(2006)[6,7]for children below five years of age and BMI was measured using WHO growth chart(2007) for children above 5years of age.The grading of undernutrition i.e.underweight(low weight for age),stunting(low height for age) and wasting(low weight for height) was assessed by Z score or standard deviation in WHO charts ,it was graded as mild,moderate & severe when the values were -1SD to -2SD,-2SD to -3SD &<-3SD respectively.Based on MUAC(WHO classification),malnutrition is graded as mild(12.5-13.5cm) moderate(<12.5cm) and severe(11.5cm) for children below 5years of age.All statistical methods were carried out through SPSS forwindows (version 23). Chi square test was employed to get an association between Gender and variables. P value<0.05 was considered as statistically significant

IV. Results:

Of total 770 children ,401(52.1%) were males and 369 were females(47.9%) as seen in the graph no.1.Majority(57.1%)of children were in the age group of 3-4years of age,followed by 18.4% in the age group of 2-3 yrs,14% in the age group of 4-5yrs,8.4% in the age group of 1-2yrs and least(1.9%) in the age group of 5-6years.90.4% children belonged to Hindu religion,6.5% were Muslims,1% were Christian and 2.1% belonged to other religion.



GRAPH NO.1 DISTRIBUTION OF GENDER IN THE STUDY

In the present study, majority(50.8%) of children belonged to Class IV Socio-economic status followed by 28.6%,13.2%,6% and 1.4% to Class III,Class V,Class II and Class I respectively.In head to toe examination 6.75% children had frontal bossing, 13.0% had thin & sparse hair and 5.2% of the participants had flag sign,44.2% had pale palpebral conjunctiva(anemia),5.7% children had angular stomatitis,20.3% of the children had caries teeth, 4.2% of the children had platynychia/koilonychia.

In our study the mean (SD) Weight (Kg) in male and female children was 15.11kg & 13.30kg respectively as shown in Table no.1There was a significant difference between the 2 groups in terms of Weight (Kg) as p = 0.003, with the mean Weight (Kg) being highest in the male children.

TABLE NO.1: COMPARISON OF THE 2 SUBGROUPS OF GENDER IN TERMS OF WEIGHT

Weight (Kg)	Gender		Wilcoxon Test	
	Male	Female	W	p value
Mean (SD)	15.11 (10.39)	13.30 (2.28)	83203.000	0.003
Median (IQR)	14 (2)	14 (3.5)		
Range	9 - 18	8 - 17		

The mean (SD) Height (cm) in male& female children was 93.95cm &93.6cm respectively.Overall prevalence of underweight was 37.4%.The prevalence of underweight in male & female children was 36.04%&38.78% respectively.Overall prevalence of mild ,moderate and severe degree of underweight in the study was18.27%,15.89% and3.17% respectively.Prevalence of moderate degree of underweight was more in female children (19.11%) than male children(12.94%).This difference was statistically significant as p=0.03 as seen in Table No.2.

The overall prevalence of stunting was 36.82% and the prevalence in male children was 35.03% and female children was 38.78%..Prevalence of moderate degree of stunting was more in female children (19.39%) than male children(12.94%).This difference was statistically significant as p=0.023 as shown in Table No.3.

TABLE NO.2:ASSOCIATION BETWEEN GENDER AND WEIGHT FOR AGE(<5YRS OF AGE)

Weight for Age	Gender			Chi –squared test	
	Male	Female	Total	X^2	p-value
Normal	252(63.96%)	221(61.22%)	473 (62.6%)		
Mild	79(20.05%)	59 (16.34%)	138 (18.27%)	0.67	0.41
Moderate	51 (12.94%)	69 (19.11%)	120 (15.89%)	4.44	0.03
Severe	12 (3.05%)	12 (3.32%)	24 (3.17%)	0.09	0.75
Total	394(100.0%)	361 (100.0%)	755 (100.0%)		

The overall prevalence of wasting was 22.52% and mild ,moderate and severe degree of wasting in the study was10.46%,10.99% and1.06%% respectively. Prevalence of moderate & severe degree of wasting was more in female children than male children.This difference was statistically not significant as p=0.12 and p=0.16 respectively as seen in Table no.4.

TABLE NO.3 HEIGHT FOR AGE IN MALE AND FEMALE CHILDREN(<5YRS OF AGE)

Height for Age	Gender			Chi-Squared Test	
	Male	Female	Total	X^2	P Value
Normal	256 (64.97%)	221 (61.22%)	477 (63.18%)		
Mild	79 (20.05%)	61(16.89)	140 (18.54%)	0.33	0.56
Moderate	51 (12.94%)	70(19.39%)	121 (16.02%)	5.12	0.023
Severe	8 (2.03%)	9(2.49%)	17 (2.25%)	0.28	0.59
Total	394 (100.0%)	361 (100.0%)	755 (100.0%)		

BMI was calculated for children above 5 years of age and it was normal in both male and female children.The prevalence of mild ,moderate and severe degree of malnutrition based on mid upper arm circumference(MUAC) in the study was17.21%,10.59% and0.79%% respectively.Presence of mild,moderate & severe degree of malnutrition based of MUAC was more in female children than male children.This difference was statistically not significant as p>0.05.In the present study,21.7% female children had skin fold thickness less than 1cm and 15% of male children had skin fold thickness less than 1cm.This difference was statistically significant as p=0.016 as seen in Table no.5

Weight for Height	Gender			Chi squared Test	
	Male	Female	Total	X^2	P Value
Normal	313(79.44%)	272(75.35%)	585(77.48%)		
Mild	41(10.40%)	38(10.52%)	79(10.46%)	0.07	0.78
Moderate	37(9.39%)	46(12.74%)	83(10.99%)	2.32	0.12
Severe	3(0.76%)	5(1.38%)	8(1.06%)	0.81	0.36
Total	394(100%)	361(100%)	755(100%)		

TABLE NO.4 WEIGHT FOR HEIGHT IN MALE AND FEMALE CHILDREN (<5YRS OF AGE)

V. Discussion

In the present study,out of 770 children,401(52.1%) were male and 369(47.9%)were female children ,which is similar to the study conducted by Sanjeev Kumar et al[8] where 52% were males and 48% were females and also to the study conducted by Anil Singh Baghel et al[9] where out of 380 children,192 (50.5%) were boys and remaining 188 (49.5%) were girls.In the present study,maximum number (57.1%)of children were in the age group of 3-4years of age and minimum(1.9%)in the age group of 5-6years.This was almost similar to the study conducted by Gagan Deep Kaur et al[10] where majority(68.5%)were in the age group of 3-4years.

Skin Fold Thickness	Gender			Chi-Squared Test	
	Male	Female	Total	X^2	P Value
>1cm	341 (85.0%)	289 (78.3%)	630 (81.8%)	5.829	0.016
<1cm	60 (15.0%)	80 (21.7%)	140 (18.2%)		
Total	401 (100.0%)	369 (100.0%)	770 (100.0%)		

TABLE NO.5 ASSOCIATION BETWEEN GENDER AND SKIN FOLD THICKNESS

The prevalence of frontal,angular stomatitis,caries teeth and nail changes were less when compared to study conducted by I.V.Mamatha et al[11]. The prevalence of angular stomatitis and dental caries was 5.7% and 20.3%was almost similar to the findings of the study conducted by Tarun Kumar et al[12]. In the present study,overall prevalence of underweight,stunting and wasting in children less than 5 years of age was 37.4%,36.82% and 22.52% and almost similar to the prevalence of the study conducted by Vikas Gupta et al[13] and also similar to NFHS-4[14] data where national average of stunting is 38.4%,underweight is35.7% and wasting 21%.

In the present study,overall prevalence of mild ,moderate and severe degree of malnutrition based on mid upper arm circumference(MUAC) was17.21%,10.59% and0.79%% respectively which is less than the prevalence in a study conducted by SK Gautam et al[15].In the present study,21.7% female children had skin fold thickness less than 1cm and 15% of male children had skin fold thickness less than 1cm.This difference was statistically significant as p=0.016.

VI. Conclusion

This studyindicated that the prevalence of underweight,stunting and wasting is similar to national average as stated in NFHS-4.Underweight and stunting was more in female children than in male children.These results showed that the nutritional status of children in the studied population is good compared with other studies. Among malnourished children, the majority were mildly malnourished and only a small percentage of children required nutritional modifications.However nutritional status of children is often the result of many

interrelated factors.Hence a comprehensive nutritional survey is required to obtain precise information on the prevalence and geographic distribution of nutritional problems in a community.

VII. Recommendation

Based on the observations made during the course of the study and considering the results of the study the following recommendations are advised:

1.ICDS programme needs to be strengthened to target the under privileged and vulnerable groups with health promotion activities and nutrition education programme. Parents need to be educated and made aware of locally available and low cost nutritious food items.These measures will help in improving the nutritional status of these children.

2.Quality of supplementary nutrition should be enhanced especially on high protein and calorie intake.

3.Various child welfare programmes need to be merged and effectively implemented ,monitored and supervised.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committe

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Dr.Ranjini.G.Naik, et. al. "Study of Nutritional Status of Anganwadi Children under Icds in Rural Field Practice Area of Adichunchanagiri Institute of Medical Sciences." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(07), 2021, pp. 52-57.