Journal of Case Studies and Case Reports

Research Article   Open Access

Estimation of nutrition deficiency disorders in school children of east godavari district

Siddavatam Pradeep Kumar Reddy[1*], Dr. Naga Subrahmanyam S[2], UB. Supriya Manvi[3], S.S.S.S Suma[4].

[1,2]Assistant Professor, Dept. of Pharmacy Practice, Koringa College of Pharmacy, Korangi-533461, Kakinada, A.P, India

[3]Pharm.D Interns, Dept. of Pharmacy Practice, Koringa College of Pharmacy, Korangi-533461, Kakinada, A.P, India

[4]IV/VI Pharm.D,Dept. of Pharmacy Practice, Koringa College of Pharmacy, Korangi-533461, Kakinada, A.P, India

Abstract

This study was to enlist the common nutriment deficiencies in school children belonging to rural areas of East Godavari district; we also aimed at Creating Cognizance. National Rural Health Mission also expressed that nutritional disorders account about 35-43 % childhood deaths and as a challenge in the under developing countries like India. Over Eleven month's period, assessment of nutritional deficiency diseases was carried out in school children studying in East Godavari district. Nutritional assessment was done by direct interviewing of school children, also by considering the children's health book. In this 11 months interventional study there were 2944 participants of those 1875 were boy participants and 1069 were girl participants. We strictly followed the inclusion and exclusion criteria and the data was evaluated by the using of Microsoft Excel 2011. All study participants from 6-16years of age are included in this study. Our work says that most of the nutritional deficiency disorders can be possible in different ways like inadequate taking of diet by an individual and pregnant woman during the pregnancy which makes the child as high risk to nutritional deficiency disorders.Keywords: Clinical case documentation formats, SOAP Analysis, FARM Note, Core Analysis, Physicians.

Keywords: Rural school children, Nutriment deficiency diseases, Intervention, Eleven Months, Epidemiology work, Data Collection.

Introduction

Nutriments and Minerals are considered to be most essential for the existence of human life. Every nutriment has got its specific physiological role to play for the maintenance, growth and development of the body. Our diet must be adequate in all these nutriments. If the diet does not provide these in adequate amounts dietary deficiencies and disorders are bound to occur. Nutriment is coming to the fore as a major modifiable determinant of chronic disease, with scientific evidence increasingly supporting the view that changes in diet have strong effects, both positive and negative, on health throughout of the life. Most importantly, dietary changes may not only influence present health, but may determine whether or not an individual will develop such conditions as cancer, cardiovascular problems and diabetes much later in life. Health and nutrition are the most important contributory factors for human resource development in the country. India has been classified by the World Bank as a country with a low income economy, with per capita GNP of US $ 950. It ranks 160 in terms of human development among 209 countries. Among the Indian population, about 28% in the rural and 26% in the urban areas are estimated to be below the

poverty line which is defined as the expenditure needed to obtain, on an average, 2400 Kcal per capita per day in the rural areas and 2100 Kcal in urban areas. Long- term malnutrition (under and over) leads to stunting and wasting, non-communicable chronic diet related disorders, increased morbidity and mortality and reduced physical work output. It is a great economic loss to the country and under mines development.

AIMS AND OBJECTIVES

We aimed to Estimate the nutriment deficiency disorders in rural school children of East Godavari district. To enlist the common nutriment deficiencies in school children belonging to rural areas of East Godavari district. Improving the health and nutriment of schoolchildren through school-based programs. Offer a more cost-effective route for delivery of simple health interventions and health promotion. Discuss measures of prevention & treatment for these nutriment deficiency diseases.

MATERIALS AND METHODS

Study design

A Prospective interventional study.

Study site

The study was carried out at rural government ZPHS schools in East Godavari district ; it is a rural setup, government ZPHS school in Korangi (BOYS), ZPHS school in Korangi (GIRLS), ZPHS school in Tallarevu (BOYS), ZPHS school in Tallarevu (GIRLS), ZPHS boys and girls school, Karapa, ZPHS girls and boys school Kajuluru, Andhra Pradesh (state), and India.

Study size

Study size of the study was 2944 in which boys and girls were involved in the study.

Study period

Eleven months from April 2019 to February 2020

Data collection: Collected by direct interviewing of school children and from the children health data maintained by the schools.

STUDY CRITERIA

Inclusion criteria

Students studying in rural government ZPHS schools of East Godavari district.

- Children aged from 6 to 16years.
- Children suffering from nutriment deficiency disorders.

- Children who had experienced the signs and symptoms of nutritional deficiency disorders at present and past.

Exclusion criteria

- Private school study children.
- Children who are with congenital disorder.
- Children who are not willing to participate in study

DATA ANALYSIS

The data collected form Questionnaires and health data.

Data sources

Data is collected by direct interviewing of school children, also from the children health book and the forms like nutrition assessment form, nutritional knowledge assessment form, nutritional survey general clinical examination form were used to collect the data

Follow-up methods

For follow-up of children, regular visiting to the schools daily and enquiring about their health status and frequency of nutritional deficiency disease signs and symptoms and by data from children health book.

Variables

Outcomes: BMI, BMR, Weight, Height, Wt/age, Ht/age, Ht/wt%

RESULTS AND DISCUSSION

AGE VERSES SEX RATIO OF STUDY PARTICIPANTS

Nutriment deficiency diseases assessment in rural school children was made from July 2012 to January 2013 in rural government ZPHS schools of East Godavari district there were 2944 participants of those 1875 were boy participants and 1069 were girl participants. All study participants from 6-15 years of age are included in the study. Most of the patients lie in the range of 12 to 15 years of age. Out of all the 859 boy study participants around 242 boys lie between 6 to 8 years and 232 lie in 9 to 11 years age group and remaining 385 boy participants were in between 12 to 15 years of age. Out of all the 613 girl participants around 137 girls lie between 6 to 8 years and 193 girls lie in 9 to 11 years age group and remaining 283 girl participants were in between 12 to 15 years of age. Number of study participants in age groups of 6 to

8, 9 to 11 and 12 to 15 are 379, 425 and 668.

**Tab-1: Age Verses Sex Ratio of Study Participants**

S.No	Age group(yrs)	Sex	No. of study participants (N %)
1	6-8	Boys	525(17.83%)
		Girls	285(9.68%)
2	9-11	Boys	640(21.73%)
		Girls	343(11.65%)
3	12-15	Boys	710(24.11%)
		Girls	441(14.97%)
		Total	2944(100 %)

MALNUTRITION AMONG STUDY PARTICIPANTS ACCORDING TO WHO CHILD GROWTH STANDARDS

Malnutrition of boy study participants according to WHO Child Growth Standards were as follows normal (n=372), under weight (n=732), wasted (n=486) and stunted (n=285). Malnutrition of girl study participants according to WHO Child Growth Standards are normal (n=145), underweight (n=453), wasted (n=289), stunted (n=182). Malnutrition of total study participants according to WHO Child Growth Standards were as follows normal (n=517), underweight (n=1185), wasted (n=775) and stunted (n=467). Less frequent study participants were stunted comparatively according to WHO Child Growth Standards.

Tab 2: Malnutrition among Study Participants According To WHO Child Growth Standards

| S.No	Nutritional Status	Boys	Girls	Total N (%)
1	Normal	372(19.84%)	145(13.56%)	517(17.5
2	Under weight	732(39.04%)	453(42.37%)	1185(40%)
3	Wasted	486(25.92%)	289(27.03%	775(26.3
4	Stunted	285(15.20%)	182(17.02%	467(15.8
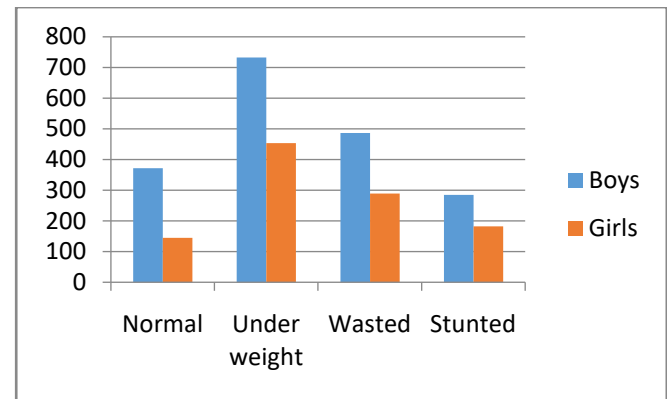
Graph-2: Malnutrition among Study Participants According To WHO Child Growth Standards

DIETARY HABITS OF STUDY PARTICIPANTS AS PER NIN DAILY RECOMMENDED INTAKES

Trends of dietary habits of boy study participants as per NIN daily recommended intake were: vegetables and fruits (n=1275), milk products (n=145), bread products (n=172), meat (n=90) and other products (n=193). The dietary habits of girl participants were: vegetables and fruits (n=518), milk products (n=181), bread products (n=67), meat (n=142) and other products (n=161). The total study participants dietary habit trends include as follows: vegetables and fruits (n=1793), milk products (n=326), bread products (n=239), meat (n=232) and other products (n=354). According to NIN daily recommended intakes, bread products, meat and milk products were taken by less number of participants comparatively.

Tab 3: Dietary Habits of Study Participants as Per NIN Daily Recommended Intakes

S.No	Daily Dietary habits	Boys	Girls	Total N (%)
1	Vegetables & fruits	1275(68%)	518(48.45%)	1793(60.90%)
2	Milk products	145(7.73%)	181(16.93%)	326(11.07%)
3	Bread product	172(9.17%)	67(6.26%)	239(8.11%)
4	Meat	90(4.8%)	142(13.28%)	232(7.88%)
5	Others Products	193(10.29%)	161(15.06%)	354(12.02%)
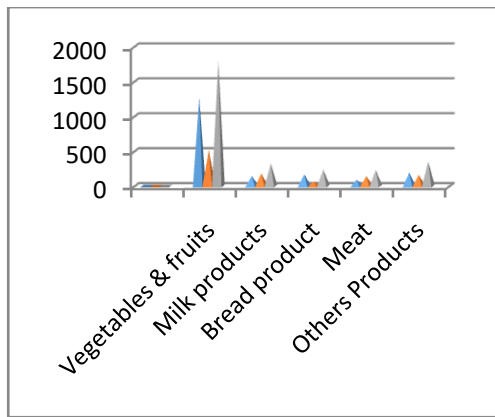
Graph 3: Dietary Habits of Study Participant's as Per NIN Daily Recommended Intakes

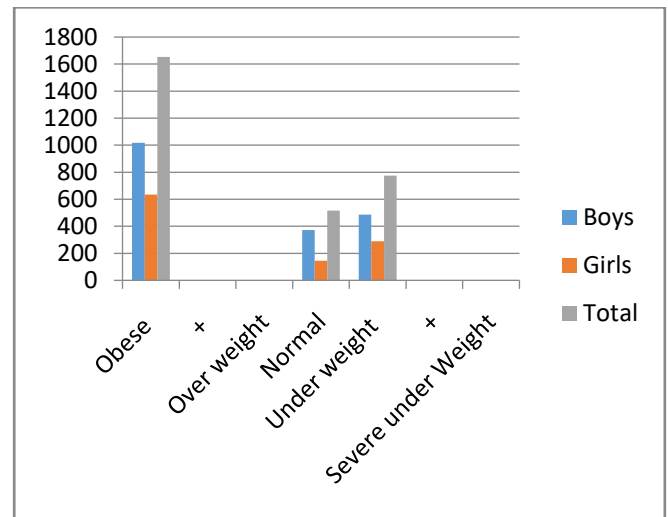|				
1	Obese + Over weight	486(25.92%)	289(27.03%)	775(26.32%)
2	Normal	372(20%)	145(13.56%)	517(17.56%)
3	Under weight + Severeunder Weight	1017(54.24%)	635(59.40%)	1652(56.11%)

BMI VALUES AMONG STUDY PARTICIPANTS IN INTERVENTION

The trends of distribution of BMI among boys were as follows: Obese + overweight (n=486), normal (n=372) and underweight + severe under weight (1017). Among girl participants, the trends were: Obese + overweight (n=289), normal (n=145) and underweight + severe under weight (635). The trends for total participants were: Obese + overweight (n=775), normal (n=517) and underweight + severe under weight (1652).

Tab4: Distribution of BMI Values among Study Participants Before intervention

| S. No	BMI Distribution	Boys	Girls	Total

Graph 4: BMI Values among Study Participants

MUSCLE MASS AMONG BOY STUDY PARTICIPANTS

Distributions of muscle mass among boys were: those with 14-18 mm (n=1017), those with 19-25 mm (n=372), those with 26-30 mm (n=486). Distributions of muscle mass among girls were: those with 14-18 mm (n=635), those with 19-25 mm (n=145), those with 26-30 mm (n=289). Distributions of muscle mass among total students were: those with 14-18 mm (n=1652), those with 19-25 mm (n=517), those with 26-30 mm (n=775).

Tab-5: Muscle Mass among Study Participants

S. No	Distribution of Muscle mass	Boys	Girls	Total N (%)
1	14-18 mm	1017(54.24%)	635(50.40%)	1652(56.11%)
2	19-25 mm	372(20%)	145(13.56%)	517(17.56%)
3	26-30 mm	486(25.92%)	289(27.03%)	775(26.32%)
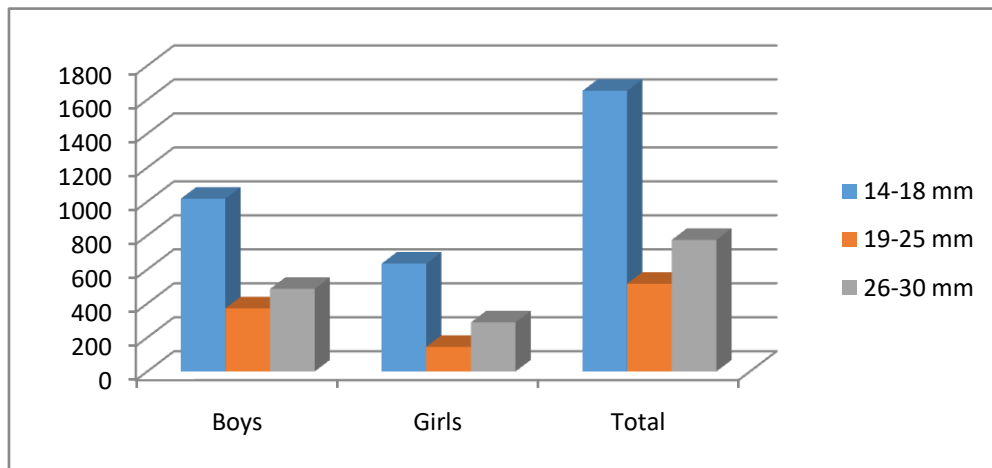
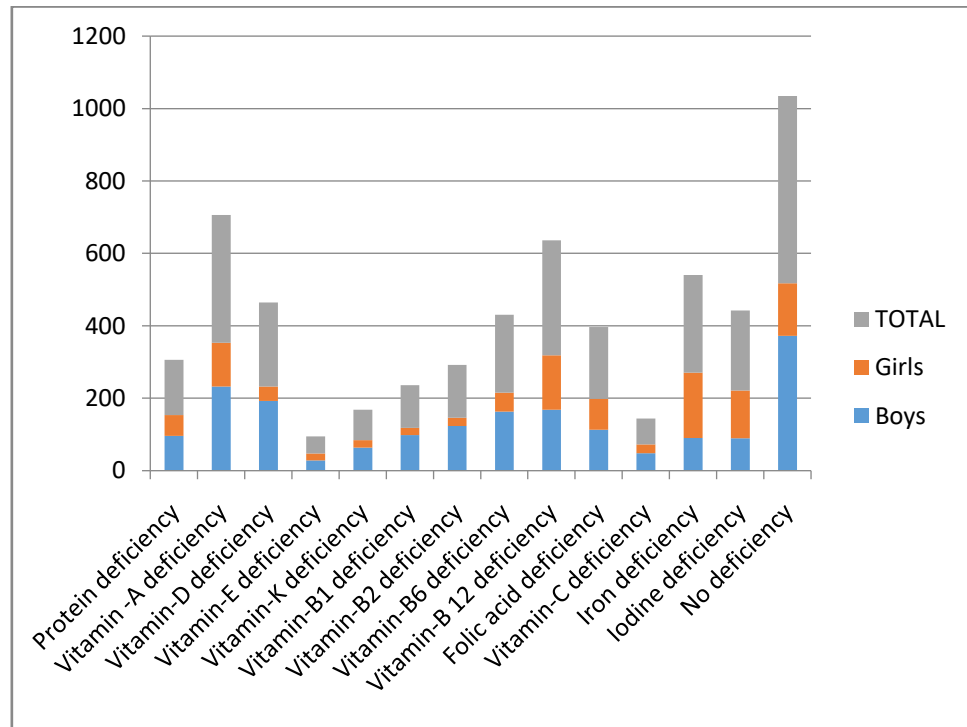**Graph 5: Muscle Mass Values among Study Participants**

NUTRITIONAL DEFICIENCIES AMONG STUDY PARTICIPANTS BEFORE INTERVENTION

Trends of Nutrients deficiency among boy study participants before intervention was as follows; n=96 had Protein deficiency, n=232 had Vitamin -A deficiency, n=192 had Vitamin-D deficiency, n=28 had Vitamin-E deficiency, n=63 had Vitamin-K deficiency, n=98 had Vitamin-B1 deficiency, n=123 had Vitamin- B2 deficiency, n= 163 had Vitamin-B6 deficiency, n=168 had Vitamin-B 12 deficiency, n=113 had Folic acid deficiency, n=48 had Vitamin-C deficiency, n=90 had Iron deficiency, n=89 had Iodine deficiency, and remaining n=372 had No Nutrients deficiencies. Trends of Nutrients deficiency among girl study participants before intervention was as follows; n=57 had Protein deficiency, n=12 had Vitamin –A Deficiency, n=40 had Vitamin-D deficiency, n=19 had Vitamin-E deficiency, n=21 had Vitamin-K deficiency, n=20 had Vitamin-B1 deficiency, n=23 had Vitamin-B2 deficiency, n=52 had Vitamin B6 deficiency, n=150 had Vitamin-B 12 deficiency, n=85 had Folic acid deficiency, n=24 had Vitamin-C deficiency, n=180 had Iron deficiency, n=132 had Iodine deficiency, and remaining n=145 had No Nutrients deficiencies. Trends of Nutrients deficiency among total study participants before intervention was as follows; n=153 had Protein deficiency, n=353 had Vitamin -A deficiency, n=232 had Vitamin-D deficiency, n=47 had Vitamin-E deficiency, n=84 had Vitamin-K deficiency, n=118 had Vitamin-B1 deficiency, n=146 had Vitamin- B2 deficiency, n=215 had Vitamin-B6 deficiency, n=318 had Vitamin-B 12 deficiency, n=198 had Folic acid deficiency, n=72 had Vitamin-C deficiency, n=270 had Iron deficiency, n=221 had Iodine deficiency, and remaining n=517 had No Nutrients deficiencies.

Tab 6: Nutritional Deficiencies among Study Participants

S.NO	Deficiency of Nutrients	Boys	Girls	Total (N %)
1	Protein deficiency	96(5.12%)	57(5.33%)	153
2	Vitamin -A deficiency	232(12.37%)	121(11.31%)	353
3	Vitamin-D deficiency	192(10.24%)	40(3.74%)	232
4	Vitamin-E deficiency	28(1.49%)	19(1.77%)	47
5	Vitamin-K deficiency	63(3.36 %)	21(1.96%)	84
6	Vitamin-B1 deficiency	98(5.22%)	20(1.87%)	118
7	Vitamin-B2 deficiency	123(6.56%)	23(2.15%)	146
8	Vitamin-B6 deficiency	163(8.69%)	52(4.8%)	215
9	Vitamin-B 12 deficiency	168(8.96%)	150(14.03 %)	318
10	Folic acid deficiency	113(6.02 %)	85(7.95 %)	198
11	Vitamin-C deficiency	48(2.56%)	24(2.24 %)	72

12	Iron deficiency	90(4.8%)	180(16.83 %)	270
13	Iodine deficiency	89(4.74%)	132(12.34 %)	221
14	No deficiency	372(19.84 %)	145(13.56%)	517

PREVALENCE OF POSITIVE SIGNS AND SYMPTOMS OF NUTRITIONAL DEFICIENCY DISEASES AMONG STUDY PARTICIPANTS BEFORE INTERVENTION

Prevalence of positive signs and symptoms of nutritional deficiency diseases among boys study participants before intervention was as follows; 13.62% (n=117) has Blindness, 0.93% (n=08) has Bleeding gums, 1.51% (n=13) has Glositis, 2.67 % (n=23) has Coiled hair, 6.63% (n=57) has Conjunctivitis, 4.42% (n=38) has Spoon nails, 5.93% (n=51) has Pallor skin, 13.15% (n=123) has Sore tongue, 18.39% (n=157) has Dry scaly skin, 8.49 % (n=73) has Sparse thin hair, 0.81% (n=07) has Parotid enlargement, 2.79 % (n=24) has Goitre, 7.91% (n=68) has Delayed wound healing and remaining 12.68%(n=109) has No signs and symptoms .

Prevalence of positive signs and symptoms of nutritional deficiency diseases among girls study participants before intervention was as follows; 20.22%(n=124) has Blindness, 0.48% (n=03) has Bleeding gums, 2.93% (n=18) has Glositis, 3.42% (n=21) has Coiled hair, 7.01% (n=43) has Conjunctivitis, 16.47% (n=29) has Spoon nails, 16.15% (n=43) has Pallor skin, 14.51% (n=89) has Sore tongue, 18.27% (n=99) has Dry scaly skin, 8.49 % (n=59) has Sparse thin hair, 0.48% (n=03) has Parotid enlargement, 0.65% (n=04) has Goitre, 3.91% (n=24) has Delayed wound healing and remaining 8.80% (n=54) has No signs and symptoms.

Table-9: Prevalence of Positive Signs and Symptoms of Nutritional Deficiency Diseases among Study Participants before Intervention

S. No	Nutritional Deficiency signs	Boys	Girls	Total (N %)
1	Blindness	152(8.10%)	78(7.29%)	230
2	Bleeding gums	119(6.34%)	83(7.76%)	202
3	Glositis	54(2.88%)	23(….%)	77
4	Coiled hair	87(4.64%)	77(7.20%)	164
5	Conjunctivitis	98(5.22%)	36(3.36%)	134
6	Spoon nails	152(8.22%)	81(7.57%)	233
7	Pallor skin	145(7.73%)	110(10.28%)	255
8	Sore tongue	69(3.68%)	19(1.77%)	88
9	Dry scaly skin	12(6.50%)	89(8.32%)	101

10	Sparse thin hair	146(7.78%)	41(3.83%)	187
11	Parotid enlargement	102(5.44%)	79(7.39%)	181
12	Goitre	82(4.37%)	93(8.69%)	175
13	Delayed wound healing	175(9.33%)	115(10.75%)	290
14	No signs and symptoms	372(19.84%)	145(13.56)	517

Prevalence of positive signs and symptoms of nutritional deficiency diseases among total study gums, 2.10% (n=31) has Glositis, 2.98% (n=44) has Coiled hair, 6.79% (n=100) has Conjunctivitis, 4.55% (n=67) has Spoon nails,6.38% (n=94) has Pallor skin, 13.72% (n=202) has Sore tongue, 17.45% (n=257) has Dry scaly skin, 8.96 % (n=132) has Sparse thin hair, participants before intervention was as follows; 16.57% (n=244) has Blindness, 0.74% (n=11) has Bleeding 0.67% (n=10) has Parotid enlargement, 1.90% (n=28) has Goitre, 6.25% (n=92) has Delayed wound healing and remaining 11.07% (n=54) has No signs and symptoms.

Prevalence of Positive Signs and Symptoms of Nutritional Deficiency Diseases among Study Participants before Intervention
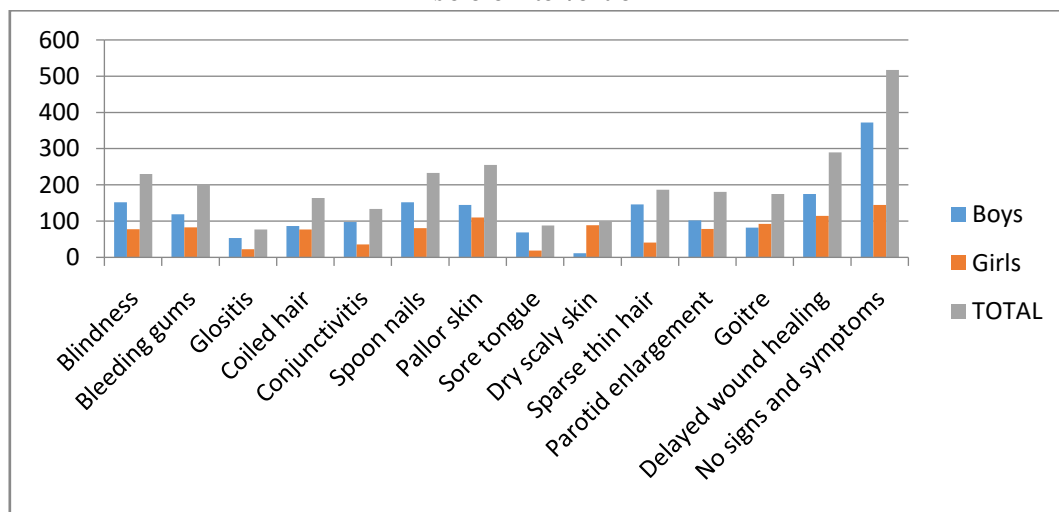
CONCLUSION

We, here by concluding that the nutriment deficiencies among the school children in rural areas of East Godavari district are 30-60%. The deficiencies are associated with delayed wound healing majorly and mostly of no signs and symptoms. This study was conducted among 2944 participants who are school children from rural areas in East Godavari district. Among them, 1875 were boys and 1069 were girls. Creating cognizance can help in preventing nutriment deficiency disorders. These can be avoided by proper intake of dietary proteins, minerals and vitamins. So, a proper awareness programme among the rural and sub-urban areas help in prevention of such diseases. And it is the duty of Clinical Pharmacists and other health professionals to educate and make people aware of nutriment deficiencies.

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