



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1257656>Available online at: <http://www.iajps.com>

Research Article

**RUBELLA VACCINATION AND COVERAGE OF TETANUS
TOXOID AMONG QAMC AND IUB BAHAWALPUR**¹Sadia Kanwal, ²Sobia Kanwal, ³Abnas Kousar, ⁴Abdul Basit¹QAMC Bhawalpur²PMC Faisalabad,³RHC Wahndo⁴Health Services Accademy Islamabad**Abstract:**

According to BMI score, 80% of children were under weight, 2.5% were overweight whereas only 17.5% were in the normal age. The indicator of weight / height percentage (wasting) showed that only 20% of children had adequate nutrition while the remaining 80% were nutritionally deficient (malnutrition). They were deficient in macronutrients. The nutritional deficiency makes children vulnerable to diarrheal disease, acute respiratory disease and other infections. The practice of placing deprived children having minimum or no emotional and material resources, in orphanage has since long been prevailing in socio-economically poor Asian countries. The main objective of the research was to determine nutritional status of food consumption patterns and dietary intake of orphanage children. The study design followed was cross-sectional descriptive epidemiological study. The study was conducted in an orphan house in Faisalabad. A total of forty children, 20 boys and 20 girls, age group 10 – 16 years were selected. Methods included on site observation, completion of standard questionnaire and anthropometric measurements. With respect to weight for age the situation indicated only 20% of the children were found to be normal. On clinical examination 92.5 percent of children were normal pertaining to HB level (above average), regarding personal hygiene 77.5% had average status of hygiene while as rest were suffering from dis-pigmentation of hair and mottled dental enamel. Results indicated that dietary intake was deficient for majority of nutrients when compared to RDA for all age groups which may be linked to poor planning of menus in orphanages.

Keywords: Malnutrition, Wasting, Anthropometric, BMI.

Corresponding author:

Sadia Kanwal,
QAMC Bhawalpur

QR code



Please cite this article in press Sadia Kanwal et al., *Rubella Vaccination and Coverage of Tetanus Toxoid among QAMC and IUB Bahawalpur*, Indo Am. J. P. Sci, 2018; 05(05).

INTRODUCTION:

Nutrition is the cornerstone of socioeconomic development of country. It is an essential component of millennium development goals (MDGs) and primary health care (PHC) and Pakistan is fully committed to implement both. Adequate nutrition is a basic human right and embedded in the constitution of most developing countries [1]. Although nutrition is the basic human need it remains unmet for vast numbers of children, they are thus unable to achieve their full genetic development potential due to malnutrition. The term malnutrition refers to both under-nutrition as well as over-nutrition. Over nutrition is the problem of the developed world, but in fact Pakistan is countering the double burden of the over and under nutrition. Our study will mainly involve under nutrition in the resident orphan's house.

Freedom from hunger and malnutrition is a basic human right and their alleviation is a fundamental prerequisite for human and national development [3]. The ability to survive the first few years of life and the quality of that survival is a function of many environmental and social stresses that impinge upon the individual child, beginning during pregnancy and continuing through infancy and childhood [3]. Malnutrition is still widely prevalent among pre-school children in developing countries. Poor nutritional intake has negative implication on children growth and immune-status leading to recurrent and increasing severe infectious illnesses and may ultimately threaten child's survival. Some of the factors that might explain the cause of such widespread malnutrition are low birth weight, insufficient supplies of food, prevalence of infectious disease, lack of breastfeeding and improper childcare [4].

Assessment of nutritional status of children is determined by: Anthropometry that includes weight, height, biochemistry includes hemoglobin levels, levels of different Nutrients or their by-products; clinical examination which includes examination of skin, eyes, hairs, nails and thyroid and dietary surveys that include eating habits overall [5]. Protein energy malnutrition has been identified as a major health and nutritional and morbidity but also leads to physical and mental impairment in children. Protein energy malnutrition is mainly due to inadequate intake of food both in quantity and quality. It can also be due to different infections like diarrhea, respiratory infections, measles and intestinal worms [6]. Malnutrition is major health concern. It affects 1800 million people, with most of them in the developing countries. The proportions are 70% in

Asia, 26% in Africa and 4% in Latin America and Caribbean [7]. The world health organization (WHO) estimates that some three billion people suffer from malnutrition of one kind or other.

One out of five people suffer from the worst of variants of malnutrition-hunger. All forms of malnutrition are associated with significant morbidity, mortality and economic costs, particularly in countries where both under and over-nutrition co-exist as is the case in developing countries undergoing epidemiological transition [8]. Orphan children are most vulnerable sector to malnutrition in our country. Little research has been done on the dietary needs of children living in orphanage. Promoting children's health and nutrition in orphanage is, therefore, a parity and requires attention by all. Causes of death of children placed in orphanage are largely preventable and thousands of children can be saved if their nutritional needs are met [9].

LITERATURE REVIEW

Nutritional assessment is an integral part of child care since nutritional status affects an individual's response to illness. Attention to nutritional status is especially important in children as they are undergoing complex processes of growth and development. The assessment should for the early detection of both nutrient deficiencies and excesses. According to the national nutritional survey 2001 – 2002, 38% of children between ages of 8 – 13 years reported underweight and another 36.8% stunted. People in Pakistan suffer from four types of micronutrients: zinc, iron, vitamin A and iodine [10]. United Nations International Children's Emergency Fund (UNICEF) study conducted in 2003 reports that orphans are more likely to be stunted in their growth and less likely to be enrolled in schools than children living with both parents. Poor nutrition and limited access to health services put orphans at increased risk of starvation, illness and death. Without nurturing from loving parents or a guardian, children's emotional development may be stunted as well [11].

Findings of study undertaken in Ghana indicate increase intake of both micro and macronutrients except protein by orphans in Ghana. Nutritional status indicated that 10% and 15% of children were severely stunted and wasted respectively [9]. The most documented forms of malnutrition in Kenya are protein energy malnutrition and vitamin A deficiencies among under-fives [12, 13]. Fostered children are more likely to be stunted, underweight and wasted, but the effects are not statistically significant for stunting and wasting. It was found that

children of HIV-infected parents are significantly more likely to be underweight and wasted than children of non-HIV-infected parents. They also found that boys are more disadvantaged in nutrition, but girls are more disadvantaged in schooling. In sum, clear evidence that orphaned and fostered children are disadvantaged in schooling compared with children of non-HIV-infected parents in Kenya. They found no clear relationship between orphanhood and the nutritional status of children, but fostered children tend to be more undernourished than children of non-HIV-infected parents. Malnutrition in orphan is completely lacking in National surveys. In Malawi, 64% of orphans were stunted compared with 46% of the non-orphans [14].

In Zimbabwe a strong association was found between living in an orphanage and nutritional and health outcomes such as diarrhea, acute respiratory, and underweight status among 5 – 10-year-old children. In the same study orphans were more wasted (9%) compared to non-orphanage group 2% [15]. Children stunted at school age are likely to have more exposed to poor nutrition since early childhood and the degree of stunting can tend to increase throughout the school age years [2]. However, children can exhibit catch up growth if their environment improves. This suggests that interventions for school age children can supplement efforts in the preschool years to reduce levels of stunting [3]. Underweight among school age children can reflect prenatal under nutrition, deficiencies of macro and micro-nutrient, infection and possibly inadequate attention by care givers [16]. Wasting is not as common as either stunting or underweight in school age children [17]. Iron deficiency anemia is the most widespread micronutrient deficiency affecting all age groups irrespective of gender, caste creed and religion. In India this emergency is rampant among children. Overall 72.7% of children up to the age of 3 years in urban areas and 81.2% in rural areas are anemic [18].

According to food and Agriculture Organization (FAO) reports there are above 460 million people –

15% of world's population excluding China who are South Asia where they constitute one third of the population. Malnutrition's main victims are children under the age of 15. But children under the age of five years are the hardest. On a global scale the five principal nutritional deficiency diseases that are being accorded the highest priority action are kwashiorkor, marasmus, xerophthalmia, nutritional anemias and endemic goiters [18]. Vitamin A deficiency has been recognized as a major public health and nutritional problem in India. An estimated 5.7% of children in India suffer from eye disease of vitamin A deficiency. Recent evidence suggests that even mild vitamin A deficiency increases morbidity and mortality in children. Lack of proper nutrients in orphans particularly makes children prone to disease [18].

MATERIALS AND METHODS:

Study Design:

Cross-sectional study.

Study population:

All children residing in orphan house, Faisalabad.

Study Unit:

A child residing in orphan house.

Duration of Study:

1st August to 25th August, 2014.

Place of Study:

Orphan house, Faisalabad.

Sampling Unit:

Non-probability sampling (convenient sampling).

Data Collection Procedure:

The research was conducted in an orphan house Faisalabad. For this purpose, 40 children were recruited. Data was collected on a questionnaire during face to face interview of respondents taken by the researcher.

Different questions were asked about food intake, physical activity, personal hygiene, appetite and statistics related to health.

Data analysis procedure:

The data was analyzed by SPSS – 22. Frequency and percentage were calculated and the results presented in the form of tables.

RESULTS:

Results are depicted in tabular form below:

Table – I: Age Distribution of Children

Age Groups	No of Children	Percentage
10 to 11	9	22.5
12 to 13	8	45
14 to 15	11	27.5
16 to 17	2	5

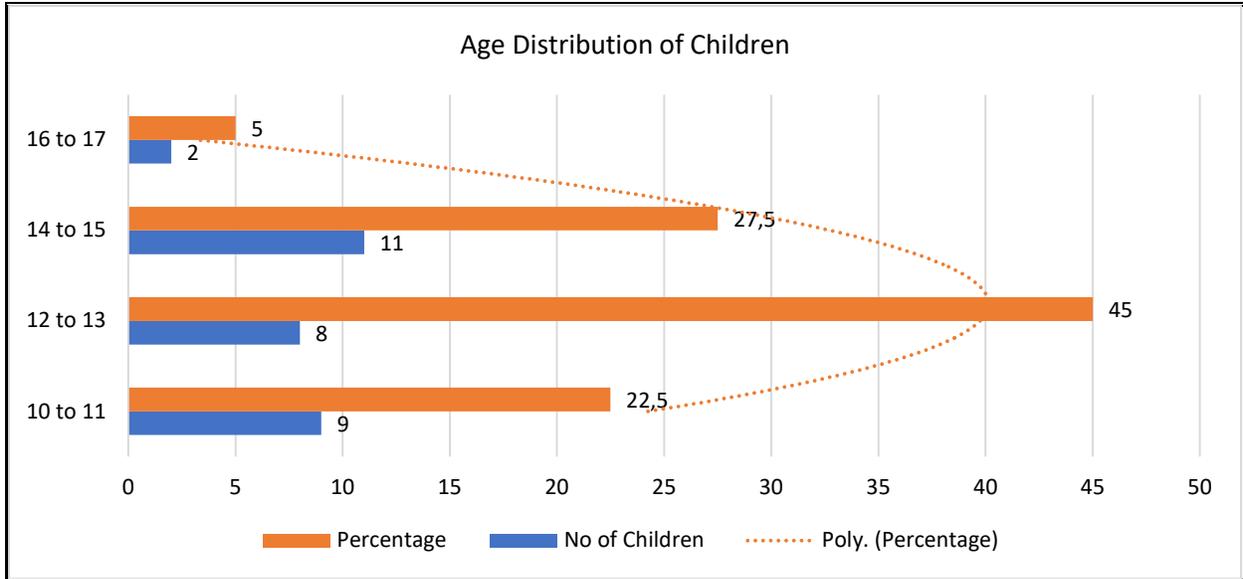
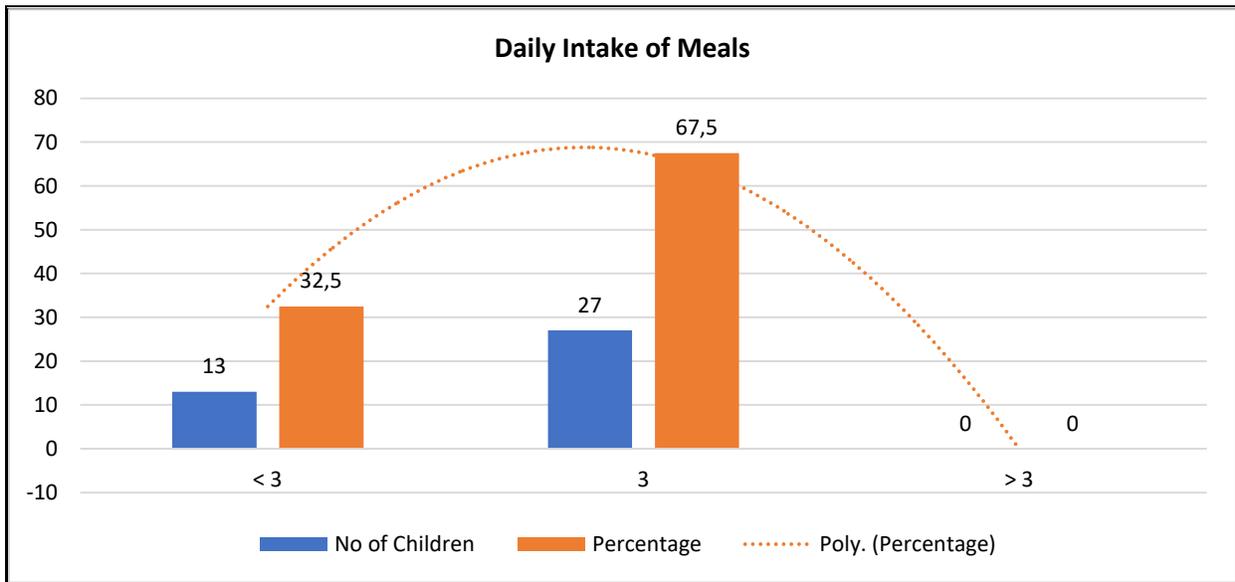


Table – II: Daily Intake of Meals

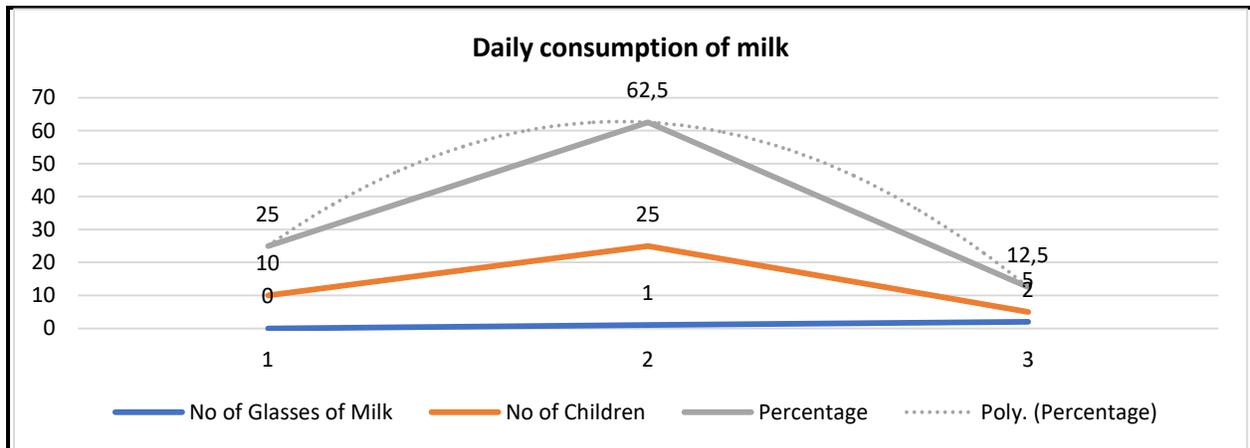
No of Meals	No of Children	Percentage
< 3	13	32.5
3	27	67.5
> 3	0	0



The pattern of regular and irregular intake showed a marked difference in health of orphans upon observation.

Table – III: Daily consumption of milk

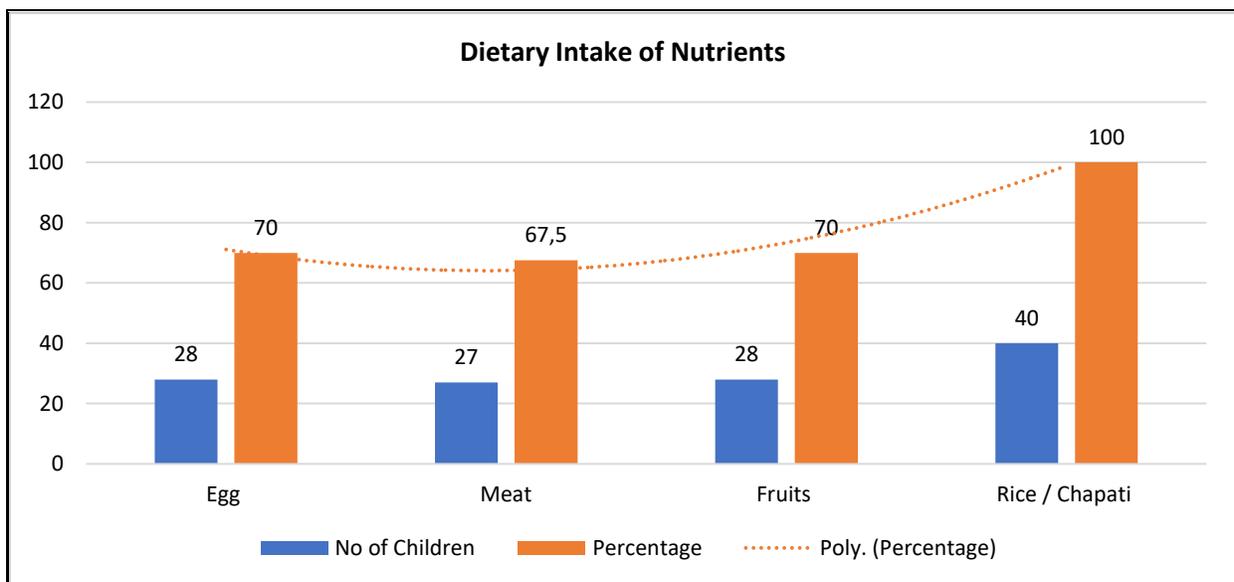
No of Glasses of Milk	No of Children	Percentage
None	10	25
1	25	62.5
2	5	12.5



There was an inadequate provision of dietary products to children.

Table – 4: Dietary Intake of Nutrients

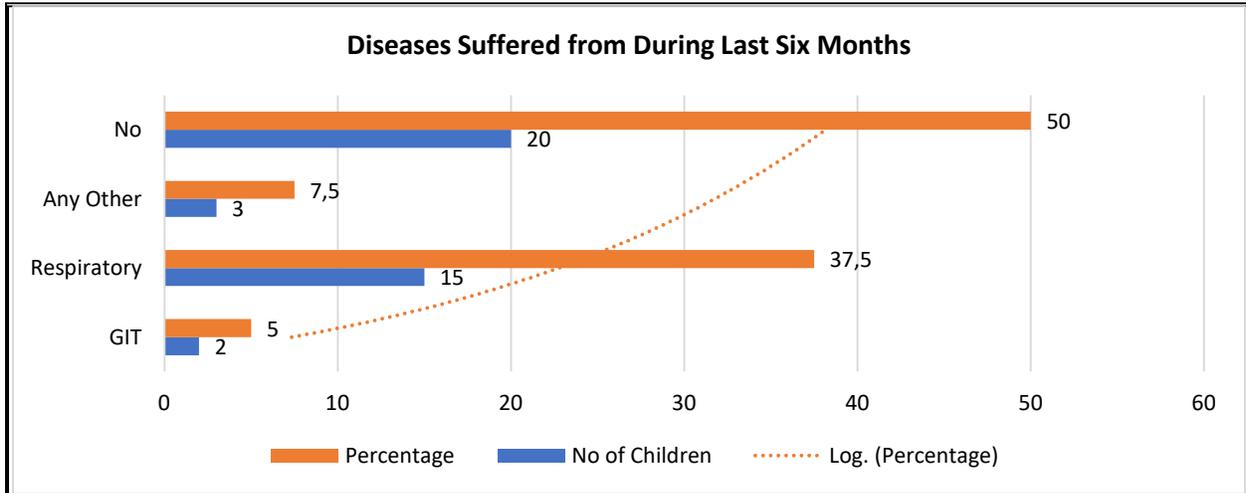
Food / Nutrient		No of Children	Percentage
Egg	Protein	28	70
Meat	Protein	27	67.5
Fruits	Vitamins, minerals	28	70
Rice / Chapati	Carbohydrates	40	100



The data in the table 4 shows that carbohydrate intake is more than required and protein consumption is satisfactory. The ratio of increased intake of carbohydrates rich diet as composed to other nutrients does not fulfill the criteria of a balanced diet.

Table – 6: Diseases Suffered from During Last Six Months

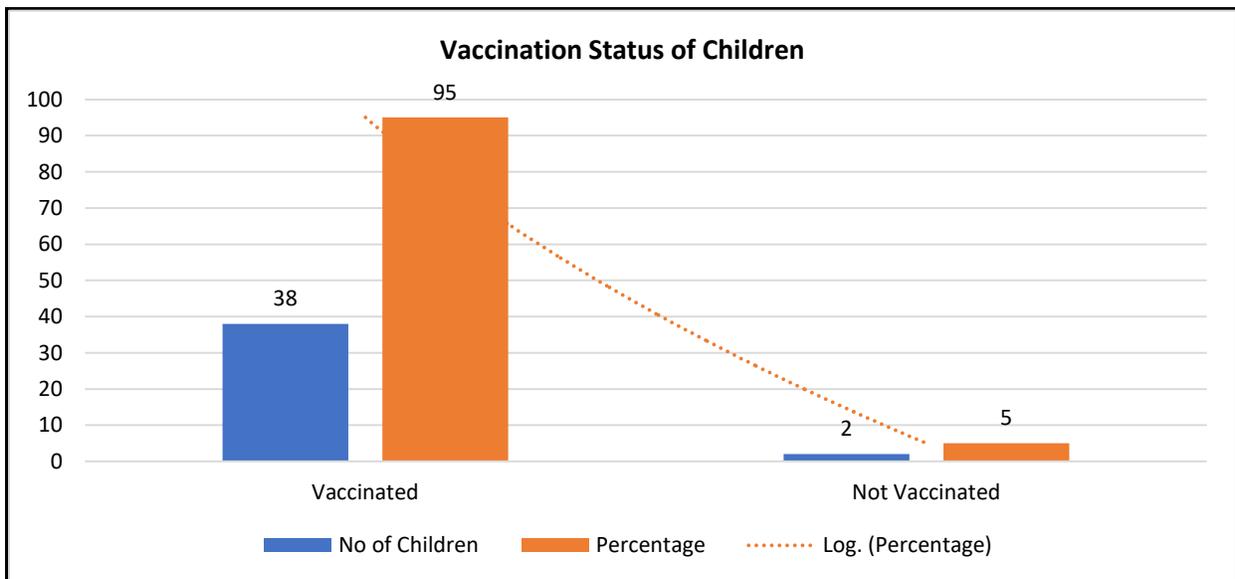
Disease	No of Children	Percentage
GIT	2	5
Respiratory	15	37.5
Any Other	3	7.5
No	20	50



The children were prone to diseases attributed to inadequate intake of balanced diet and poor hygienic condition.

Table – 5: Vaccination Status of Children

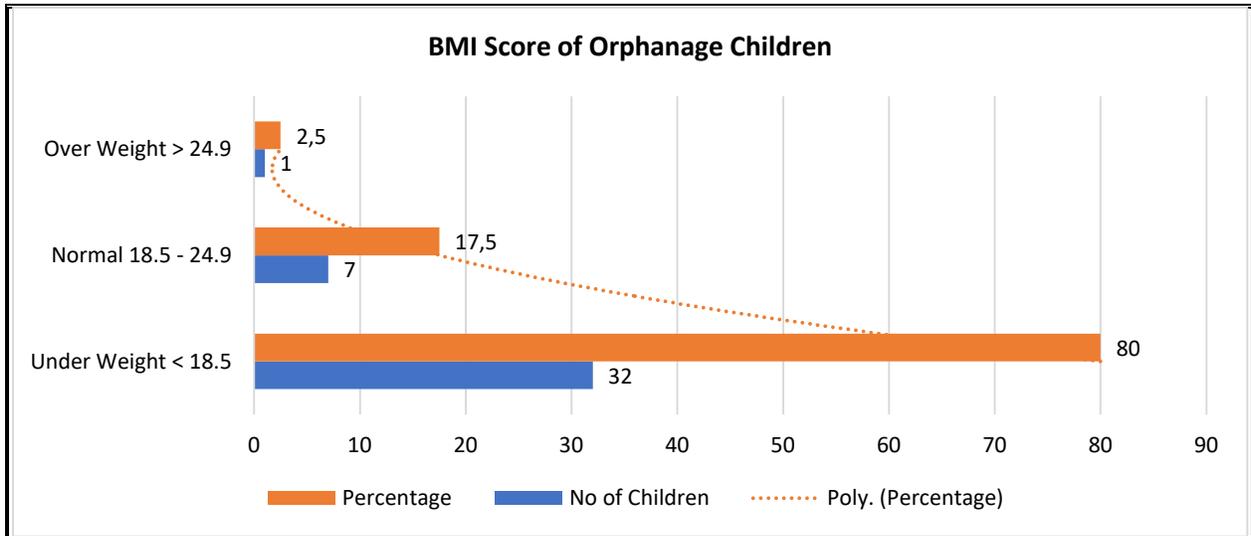
Vaccination Status	No of Children	Percentage
Vaccinated	38	95
Not Vaccinated	2	5



Vaccination status is above satisfactory.

Table – 7: BMI Score of Orphanage Children

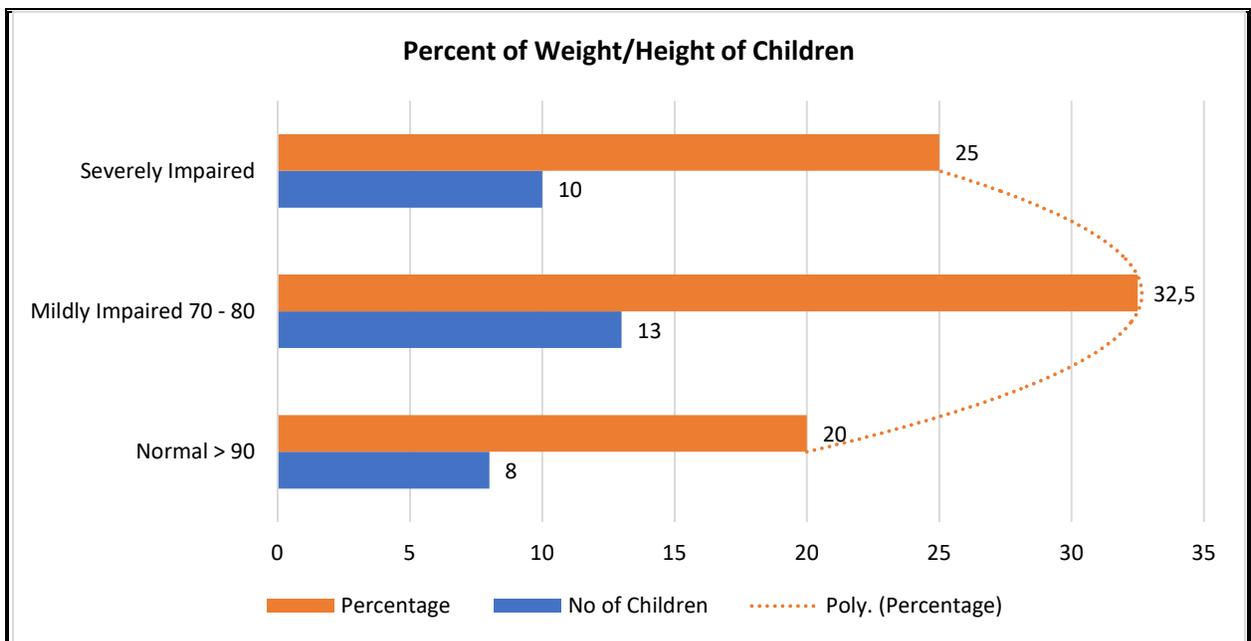
BMI	No of Children	Percentage
Under Weight < 18.5	32	80
Normal 18.5 - 24.9	7	17.5
Over Weight > 24.9	1	2.5



Majority of children were underweight indicating that dietary intake of children was somewhat deficient.

Table – 8: Percent of Weight/Height of Children

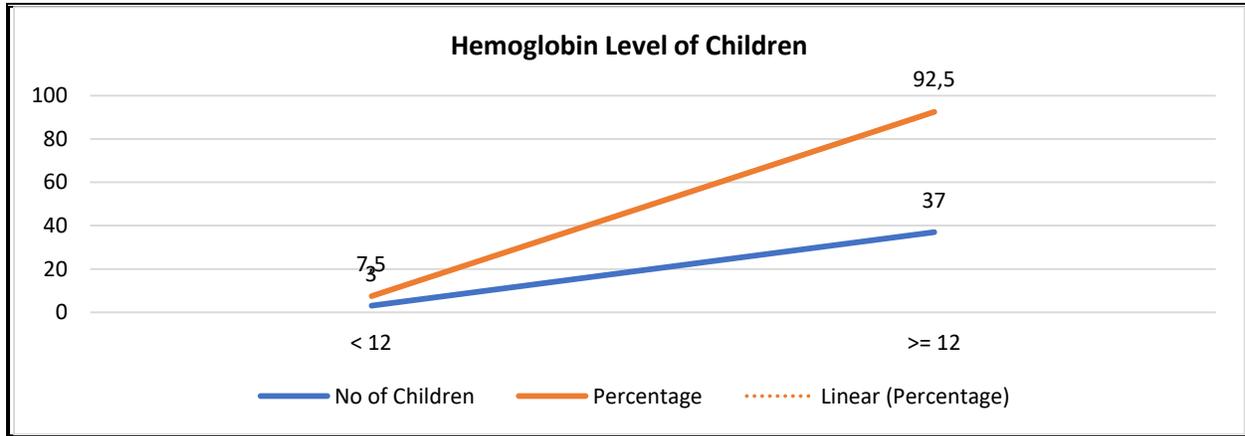
Nutritional Status	No of Children	Percentage
Normal > 90	8	20
Mildly Impaired 70 - 80	13	32.5
Severely Impaired	10	25



Wasting was significant present.

Table – 9: Hemoglobin Level of Children

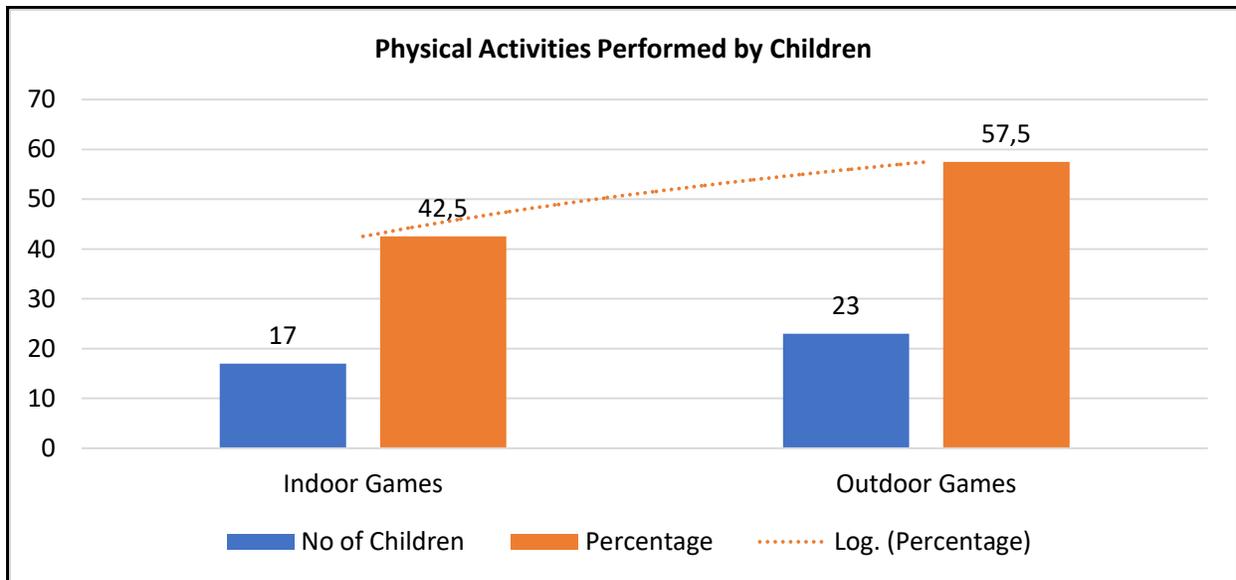
HB Level	No of Children	Percentage
< 12	3	7.5
>= 12	37	92.5



Hb levels shows satisfactory intake of proteins in diet.

Table – 10: Physical Activities Performed by Children

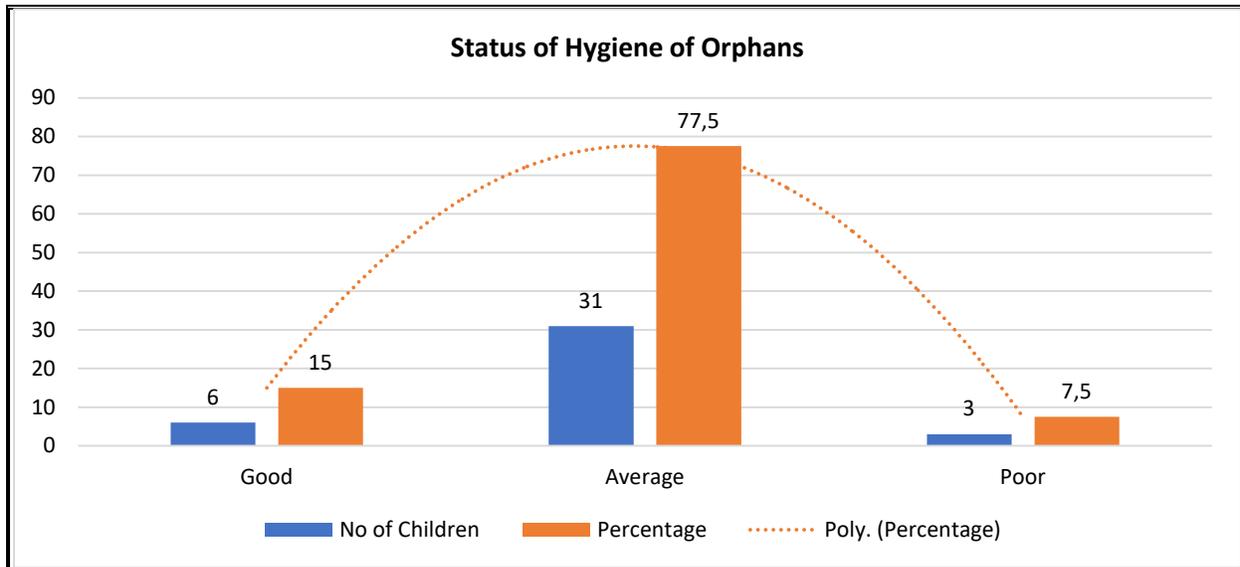
Physical Activity	No of Children	Percentage
Indoor Games	17	42.5
Outdoor Games	23	57.5



Children more indulged in outdoor games appeared healthier both physically and mentally.

Table – 11: Status of Hygiene of Orphans

Study of Hygiene	No of Children	Percentage
Good	6	15
Average	31	77.5
Poor	3	7.5



Children with poor hygiene were more prone to disease like diarrhea.

DISCUSSION:

In the study conducted at orphan house of Faisalabad regarding nutritional and dietary intake of children, 40 children were involved. Different questions were asked to assess the dietary intake of macro and micro nutrients of children and their general physical health. Results of the study are discussed below:

As for physical activity, 17 out of 40 play indoor games, 23 played cricket as shown in Table – 10.

This is commonly considered in our society that children living in orphanages of developing countries have poor health and nutritional status due to socioeconomic and environmental factors. Similar results were observed in another study to determine the nutritional status, food consumption and dietary intake of orphans in Ghana indicate, that 100% of children watched television daily, 50% received physical training at school, 35% engaged in school

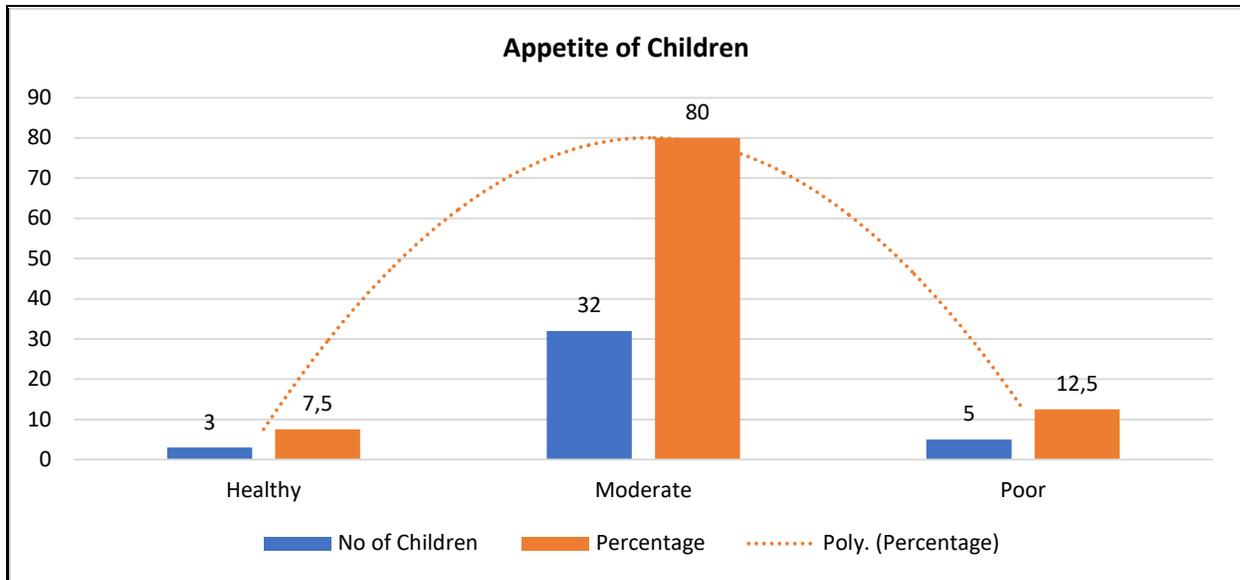
sport activities and 28% performed indoor games, for example board games and playing cards [10].

As depicted in Table – 7, BMI score of orphan house children, 80% underweight, 17.5% normal and 2.5% overweight. This shows that about 32 out of 40 children were having poor health.

Another study on nutritional status of children of Abbottabad was conducted, out of 100 children, 21% were underweight, with half of them severely stunted [10]. These figures are less compared to national figures that shows that 38% of children under 15 years of age are underweight. In neighboring countries like India (47%), in Nepal (48%), Bangladesh and Afghanistan (39%) were reported as underweight [11].

Table – 12: Appetite of Children

Appetite	No of Children	Percentage
Healthy	3	7.5
Moderate	32	80
Poor	5	12.5



Decreased appetite had several causes including dislike for food, emotional disturbances from departure of parents.

Our study showed that intake of vitamins/minerals was 70%, carbohydrate intake was 100%. Carbohydrate intake was higher than requirement and intake of protein and vitamin was satisfactory.

In contrast to our study, results of another study conducted in Jammu and Kashmir, it was found that orphans were consuming less energy, proteins, fats, vitamins and minerals as per RDA for Indians Children and Adolescents. Results indicated that dietary intake of children was deficient for all nutrients when compared to RDA for all the age groups [19], this may be linked to the poor planning of menu and purchasing procedures found in orphanages.

Study on personnel hygiene of children shows that 15% have very good hygiene, 78% have average hygiene and 8% have poor hygiene as shown in Table – 11. In contrast to another study which was done on children of orphanage of Jammu & Kashmir with respect to personal hygiene 48% had uncombed hair, 17% had untrimmed hair while only 35% had washed and combed hair, 69% had clean eyes, 23% were with dry and red eyes, while as only 18% of them had sparkling eyes, 61% had unclean ears, and only 39% of orphans had clean ears. 70% of the orphan students were having unclean and untrimmed nails, while 30% had trimmed and clean nails. This reveals poor and unhygienic conditions of children residing in orphanages.

According to our study 37.5% suffered from acute respiratory illness, 7% suffered from other illnesses, 5% had GIT problems, while 50% did not suffer from any disease during last six months. Another study

conducted in Egypt on orphanages showed that orphans were physically healthy but a greater risk of being infected by a variety of infectious diseases without parent's care threatening the normal development [20].

Weight, height and BMI for age are parameters for the health of children. Of these, weight for height is the most widely used parameter for the measurement of the nutritional status because of ease of measurement. Children can be underweighting because of the stunted and wasted. BMI is the current energy deficit because it is computed from current weight and current height of children. As low BMI is the indicator of current energy deficit, early detection of low BMI for the expeditious correction of it is likely to be the most effective intervention for preventing wasting. Prevention of wasting in the initial years of life is important because once wasting has occurred it may not readily be reversible.

The table no 8 of weight/height of orphan children shows that 20% had weight equal to the weight of normal children of respective age and 80% had less weight compared to the standard weight for that respective age group. In comparisons to the results obtained from similar study conducted in Uganda which showed that the nutritional status of orphans being better off than non-orphans is an indication that usually households which take on orphans are the ones with better household income [21]. The caregivers of the orphanage had no knowledge on the issues related to child nutrition. Since the nutritional needs of the children rely on the care given, it is essential that caregivers should be enlightened on how to make sound food that meet the nutritional

needs and food habits. Therefore, a nutritional education program should be recommended. The orphanage should link with the public health nutrition professional that can provide screening and referral for nutrition and health-related problems for both the children and categories. In future, the management of the orphanage should encourage research to improve the conditions in orphanage.

CONCLUSION:

There was a large gap in the knowledge of nutritional status and requirement of children. Macronutrients deficiency was present in orphan children. The study was conducted in an orphan house in Faisalabad. A total of forty children, 20 boys and 20 girls, age group 10 – 16 years were selected. Methods included on site observation, completion of standard questionnaire and anthropometric measurements. With respect to weight for age the situation indicated only 20% of the children were found to be normal. On clinical examination 92.5 percent of children were normal pertaining to HB level (above average), regarding personal hygiene 77.5% had average status of hygiene while as rest were suffering from discoloration of hair and mottled dental enamel. Results indicated that dietary intake was deficient for majority of nutrients when compared to RDA for a 11 age groups which may be linked to poor planning of menus in orphanages.

REFERENCES

1. Belloni, C., et al. "Revaccination against hepatitis B virus of non-responding and low-responding infants immunised at birth. A parallel evaluation of rubella and tetanus vaccine." *Vaccine* 16.4 (1998): 399-402.
2. Kretsinger, Katrina, et al. "Preventing tetanus, diphtheria, and pertussis among adults: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine recommendations of the Advisory Committee on Immunization Practices (ACIP) and recommendation of ACIP, supported by the Healthcare Infection Control Practices Advisory Committee (HICPAC), for use of Tdap among health-care personnel." *MMWR Recomm Rep* 55.RR-17 (2006): 1-37.
3. Farrington, Paddy, et al. "A new method for active surveillance of adverse events from diphtheria/tetanus/pertussis and measles/mumps/rubella vaccines." *The Lancet* 345.8949 (1995): 567-569.
4. Bardenheier, Barbara, et al. "Are parental vaccine safety concerns associated with receipt of measles-mumps-rubella, diphtheria and tetanus toxoids with acellular pertussis, or hepatitis B vaccines by children?." *Archives of pediatrics & adolescent medicine* 158.6 (2004): 569-575.
5. Ljungman, Per, et al. "Response to tetanus toxoid immunization after allogeneic bone marrow transplantation." *Journal of Infectious Diseases* 162.2 (1990): 496-500.
6. Zignol, Matteo, et al. "Assessment of humoral immunity to poliomyelitis, tetanus, hepatitis B, measles, rubella, and mumps in children after chemotherapy." *Cancer* 101.3 (2004): 635-641.
7. World Health Organization. *World health statistics 2010*. World Health Organization, 2010.
8. Williams, Walter W., et al. "Immunization policies and vaccine coverage among adults: the risk for missed opportunities." *Annals of Internal Medicine* 108.4 (1988): 616-625.
9. Deforest, Adamadia, et al. "Simultaneous administration of measles-mumps-rubella vaccine with booster doses of diphtheria-tetanus-pertussis and poliovirus vaccines." *Pediatrics* 81.2 (1988): 237-246.
10. Crossley, Kent, et al. "Tetanus and Diphtheria Immunity." *Jama* 242 (1979): 2298-2300.
11. Marlow, Robin, et al. "A phase III, open-label, randomised multicentre study to evaluate the immunogenicity and safety of a booster dose of two different reduced antigen diphtheria-tetanus-acellular pertussis-polio vaccines, when co-administered with measles-mumps-rubella vaccine in 3 and 4-year-old healthy children in the UK." *Vaccine* 36.17 (2018): 2300-2306.
12. Kader, Cigdem, et al. "Antibodies Against Vaccine Preventable Diseases in Pregnant Women Measles, Mumps, Rubella, Varicella and Tetanus in Yozgat, Turkey." *Konuralp Medical Journal/Konuralp Tip Dergisi* 9.2 (2017).
13. de Silva, R. "Immediate hypersensitivity reactions and anaphylaxis: 20 case reports." *Reactions* 1651 (2017): 311-13.
14. World Health Organization. *World health statistics 2015*. World Health Organization, 2015.
15. Freidl, Gudrun S., et al. "Immunity against measles, mumps, rubella, varicella, diphtheria, tetanus, polio, hepatitis A and hepatitis B among adult asylum seekers in the Netherlands, 2016." *Vaccine* 36.12 (2018): 1664-1672.
16. Scobie, Heather M., et al. "Tetanus immunity among women aged 15 to 39 years in Cambodia: a national population-based serosurvey, 2012." *Clinical and Vaccine Immunology* 23.7 (2016): 546-554.

17. Wong, P. T. Y. "Diphtheria tetanus and pertussis vaccine/measles mumps and rubella virus vaccine." *Reactions* 1617 (2016): 96-3.
18. Merino Arribas, Jose Manuel, et al. "Safety and Immunogenicity of the Quadrivalent Meningococcal Serogroups A, C, W and Y Tetanus Toxoid Conjugate Vaccine Coadministered With Routine Childhood Vaccines in European Infants." *The Pediatric infectious disease journal* 36.4 (2017): e98-e107.
19. Uno, Yota, et al. "Early exposure to the combined measles–mumps–rubella vaccine and thimerosal-containing vaccines and risk of autism spectrum disorder." *Vaccine* 33.21 (2015): 2511-2516.
20. Ingelman-Sundberg, Hanna M., et al. "Diverse effects on vaccine-specific serum IgG titres and memory B cells upon methotrexate and anti-TNF- α therapy in children with rheumatic diseases: a cross-sectional study." *Vaccine* 34.10 (2016): 1304-1311.
21. Dhillon, Sohita, and David Pace. "Meningococcal Quadrivalent Tetanus Toxoid Conjugate Vaccine (MenACWY-TT; Nimenrix®): A Review." *Drugs* 77.17 (2017): 1881-1896.