Research Article

Co- relationship Between Nutritional Intake and Anthropometry of Under Five Years Children of Kathmandu, Nepal

Menu Khadka[1], Mandira Tamrakar[2], Kushalata Baral[1], Suraksha Subedi[3], Sudip Khanal[1], Maginsh Dahal[4]*

[1]Department of Public Health, Nobel College, Pokahara University, Sinamangal, Kathmandu, Nepal
[2]Central Department of Home Sciences and Women Studies, Tribhuwan University, Kathmandu, Nepal
[3]Department of Nursing, Asian College for Advance Studies, Purbanchal University, Satdobato, Lalitpur, Nepal
[4]Department of Nursing, Asian College for Advance Studies, Purbanchal University, Satdobato, Lalitpur, Nepal

*Corresponding Author
Maginsh Dahal

Abstract: Nutrition is a basic need for children and pregnant women; if a child is born malnourished s/he might not be the good asset for a country. We tried to assess the co relationship between nutritional intake and anthropometry among under five children. Purposively selected 100 mothers having under five children were interviewed for the study by using pretested questionnaire. The prevalence of malnutrition was found to be 43%. Majority of mothers had hygiene practice of hand washing during and after feeding their children. The study concludes that the nutrition status was unsatisfactory among under five children.
Keywords: Nutrition, children, pregnant women, malnourished

INTRODUCTION

Nutrition is a basic need for children and pregnant women; if a child is born malnourished s/he might not be the good asset for a country. More than 80% of total brain development happens before the age of five for a child. So, a healthy child; a future of a developing nation is a more valuable and holds more significance than 1000 pages constitution of Nepal (WHO. 2018). According to the WHO, every infant and child has the right to good nutrition as stated in the Convention on the Rights of the Child. Globally in 2012, 162 million children under five were estimated to be stunted and almost 100 million had low weight-for-height, mostly as a consequence of poor feeding and repeated infections; 44 million were overweight or obese. Under nutrition is associated with 45% of child deaths (WHO. 2018; Storz, N. S., & Greene, W. H. 1983).

The infant and children are the vulnerable group for illness/diseases. In this stage, they require more nutritious food for their physical and mental growth and development (Shepherd, R., & Dennison, C.M. 2007). If a diet is poor in quality and quantity, they might suffer from various health problems such as malnutrition; underweight so on (Getaneh, D.U.K., & Yemane G/Mariam, B. 2017). Optimum nutrition helps to promote their growth and development (Subed, S. *et al*., 2019). Therefore, they need nutritious food frequently. The child's muscle development is more vigorous at this stage. Hence, during this period, child needs less calorie but more proteins and minerals for growth (Subed, S. *et al*., 2019).

Many nutritional deficiencies, such as stunting, wasting, underweight rickets and scurvy, used to be common among children before but are now very rare. This is because we now know that proper nutrition prevent the prevalence of physical and mental disorder caused by nutritional deficiencies. Hence, it is very important to make sure that children get enough nutrients such as vitamins & minerals, by eating food from the entire recommended food group daily, especially fruits and vegetables (Shepherd, R., & Dennison, C.M. 2007).

Every year one third of the world's children don't grow to their full potential because of poor nutrition It also contributes to the deaths of 2.6 million children under the age of five [WHO, 2013]. Although the situation is shocking, the good news is that global efforts to tackle this emergency are increasing and are working (Ruwali, D. 2012).

There is a high nutritional requirement for children under five years of the age because they are undergoing a period of rapid growth. At this age, good

nutrition status plays a vital role. If there is an overlap of key nutrient, it might cause a mental as well as a physical retardation in the children. Health experts say that poor maternal health among Nepali women is directly contributing to child malnutrition; nearly a quarter of the country's estimated 14.5 million women are malnourished, afflicted particularly by a low body mass index (Subed, S. *et al.*, 2019).

The nutrition status of mothers and children is traditionally poor in Nepal, despite decades of nutrition improvement interventions (Dahal, M., & Baral, K. 2015). The Nepal Demographic and Health Survey (NDHS) 2006 found that 45% and 43% of children under 5 years of age were underweight and stunted respectively and only half of children under 6 months were exclusively breastfed. With such a level, the achievement of the MDG goal is a challenge for Nepal (Guragain, A. M. etal., 2015). The high incidence of malnutrition in Nepal is linked to the issue of food security, food habit and socio-cultural practices. Extreme topography, low socio-economic status has contributed to seasonal food shortages, hence widespread chronic food insecurity. Cultural practices such as prelacteal feeding and traditional food beliefs are serious obstacles to improve nutrition. Likewise, poor hygiene and sanitation and recurrent infections signifies inadequate feeding practices by reducing absorption of nutrients (Kamath, S. M. *et al.*, 2017; Kennedy, *et al.*, 2010). The recurrent infections such as diarrhoea in young children can further illustrate the inadequate feeding practices by reducing absorption of nutrients. (NDHS, 2006) (Health Mo. 2017)

Poor nutritional status of children and women has been considered a serious problem in Nepal for many years. As one of the priority goals under the MDG, Nepal aims to reduce the level of under-nutrition in Nepal from around 60 percent of the under-fives to 30 percent by 2015. Improvement in the nutritional status is essential not only to achieve the target of the MDG, but also very importantly to achieve other goals such as reduced poverty, reduced child mortality, improved maternal health and universal primary education which are all linked to nutrition. Given the multi-factorial nature, under-nutrition has been a persistent problem. Over the past 25 years, there has been a very slow decline in its level and about half of the children are still stunted in Nepal (Nepal Go. 2018-2022).

Lack of knowledge on nutrition may cause many effects on health of children especially less than five years because they need sufficient nutrition and foods for their rapid growth and development (Malla, D. *et al.*, 2017). Children in this age group require a high demand supply of nutrients since they are usually very active and they're in a phase of rapid growth period .Also during this period, disorders related to under nutrition; in the form of kwashiorkor, marasmus, anemia and xerophthalmia are not uncommon. Malnutrition or even poor nutrition in the very young growing child results in the growth deficits and mental retardation. Whatever food ingested has been in utilized to maintain essential body function and thus essential growth. Thus, the objective of the study is to find out the nutritional status of children under five years children.

METHODS

A descriptive cross sectional study was conducted among mothers of under five children of Talung, Budanilakantha, Kathmandu, Nepal by using random sampling technique.

Hundred respondents were interviewed after talking verbal consent by using pre-tested questionnaire. BMI was calculated for the individual children by measuring height and weight individually. Also the Waterlow's classification was done. The data was collected with the parents (mothers) of children within the prescribed time and objective was explained. The collected data were classified according to their nature and edited. While editing the data necessary things were put and unnecessary things were removed. This data has been analyzed using of computer software (statically package for social science) SPSS 20.0. Frequency, percentages and correlation was calculated to justify the objective of study.

RESULTS

Table 1: Demographic characteristics of the children (n=100)

Demographic characteristic	Frequency	Percent
Age (months)		
12-16	22	22.0
17-21	4	4.0
22-26	14	14.0
27-31	2	2.0
32 and above	58	58.0
Gender		
Male	50	50.0
Female	50	50.0

The above table shows the background characteristics of the children. Majority of the children (58%) were from age group 32 and above. Similarly 22% children were from age group 12 to 16 months, 14% were from 22 to 26 months, 4% were from 17 to 21 months and 2% from 27 to 31 months. The second background characteristic shows the sex of the respondents where the distribution of girls and boys is equal.

Table 2: Mother's knowledge on nutrition and feeding practices (n=100)

Variables	Frequency	Percentage
Nutritional knowledge of mother		
Yes	31	31.0
No	69	69.0
Feeding Practice		
Yes	29	29.0
No	71	71.0
Continue breast feeding		
Yes	42	42.0
No	58	58.0
Feeding Frequency		
3 times	38	38.0
4 times	20	20.0
5 times	25	25.0
more than 5 times	17	17.0
Children like to eat more		
Noodles/cheesball	31	31.0
Lays /kurkure/chips	11	11.0
Chocolates	32	32.0
Pepsi /cocola /frootiI /fanta	8	8.0
Biscuit	4	4.0
No snacks	14	14.0

The above table shows that 58% of mother does not continue breastfeeding. It can also be illustrated that 38% of mother feed their child 3 times a day. Similarly, 32% of children like to have chocolates.

Table 3: Hygiene practice and Illness (n=100)

Washed hand before meal	Frequency	Percent
Yes	97	97.0
No	2	2.0
Sometimes	1	1.0
Types of soap		
Dettol	25	25.0
Beauty bar	9	9.0
Life boy	34	34.0
Hand wash	6	6.0
Washing soap	4	4.0
Only water	22	22.0
Types of water		
Boiled	37	37.0
Filter	34	34.0
Sod is	1	1.0
Direct tap	28	28.0
Ill frequently		
No	8	8.0
Sometimes	92	92.0
Feeding During Illness		
Normal	64	64.0
Soft diet	36	36.0

From table 3 it shows 97% of children washed their hand before having meal, 34% of children washed their hand with life boy soap. It also shows that 92% of child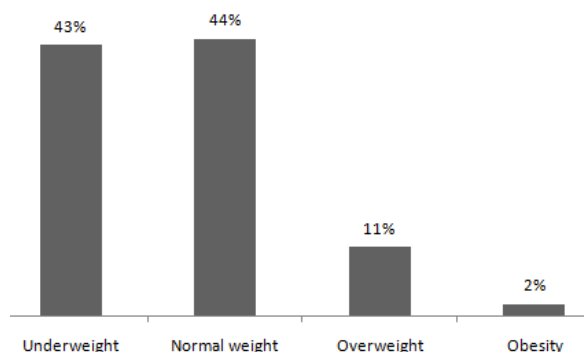ren were ill sometimes where as 37% of mothers were providing boiled water for their children. Regarding diet, 64% 0f the mothers fed normal/ balance diet to their children during illness.

Figure 1. BMI Classification

Figure 2. Water Low's Classification

Figure 1 reflects that out of total children, 44% of children had normal weight and 43% of children were underweight, 11% of children were overweight and only 2% of children had obesity.

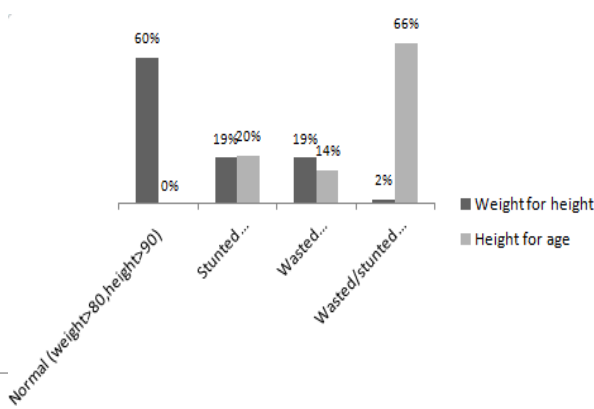Figure 2 reflects that majority of the children 60% were found to be normal after comparing with water low classification. 60% of children were normal (weight for height), 19% of children were stunted, 19% children were wasted and 2% of children were stunted. In the same way 20% of children were stunted (height for age), 14% of children were wasted and 40% of children were wasted/ stunted.

Table 4: Correlation relation between feeding practices and anthropometry (n=100)

Co-relation	Feeding practices	Length	Weight
Pearson Correlation	1	.111	.069
Sig. (2-tailed)		.272	.496
Total	100	100	100
Pearson Correlation	.111	1	.788[**]
Sig. (2-tailed)	.272		.000
Total	100	100	100
Pearson Correlation	.069	.788[**]	1
Sig. (2-tailed)	.496	.000	
Total	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Thus, it is concluded that there is significant positive, higher and linear co-relation between feeding practices and anthropometry.

DISCUSSION

In order to assess the Co relationship between nutritional intake and anthropometry measurement of under five years Children: 100 Children were selected through VDC profile of Taulung, Kathmandu district. Anthropometric indices were used and were compared to WHO child growth standards. Deviation of the anthropometric indices from the standard value is regarded as evidence of malnutrition .Weight-for-height and Height-for age is used as main anthropometric indices and defects from these indices are called stunted and wasted. For each indices Z score minus 2SD and Z score minus 3SD compared relatively (19%) stunted and (19%) wasted (CDC. 2015). According to Nepal Demographic and Health Survey 2011, 41% of children were stunted and 11% were wasted with the compression of DHS 2011 nutrition indicator stunted is improved but wasted is increased (Health Mo. 2017). Similarly the finding from the study conducted in chitwan Nepal, prevalence of underweight, stunting and wasting was 22.7%, 37.3% and 25.7% respectively. Study indicated that the risk of stunting increases with age. Socioeconomic status was most important factors associated with stunting, underweight and wasting. Meeting the minimum dietary diversity, minimum meal frequency and minimum acceptable diet was associated with better nutritional status of children (Ruwali, D. 2012).

Studies have shown that 42% of mothers continue breastfeeding has positive effects on the nutritional status of children. According to Ministry of Health Around 31% of the children in Nepal are breastfed within one hour and 64.9% of them receive it within one day of birth (Nepal Go. 2018-2022). More urban children are breastfed within one hour (34.2%) and within one day (72.3%) as compared to rural children with 30.9% and 64.4% respectively. Around 69% of the children are fed with the first breast milk (Bashour, H. N. 2004).

An important factor in whether common childhood illnesses become life-threatening to the individual child is the family's—and particularly the mother's—knowledge of appropriate care and healthcare-seeking behaviour. Many mothers do not recognize the early danger signs of childhood illnesses. Even if they do recognize such signs, the distance to a point of service, the cost of such a service, and its level of quality also inhibit many families from making use of available healthcare options. Only about one in five children with either diarrhoea or a 'cough/cold' are taken to a healthcare provider and Water supply is the third element for ensuring that the transmission routes for disease are broken. Studies have shown that water quantity has a greater impact on disease reduction than water quality (Shepherd, R., & Dennison, C.M. 2007).

Studies shows that most of the children 32% of children like to have chocolates, similarly 31% of children like to have noodles/cheese ball, 14% of children were skipping snacks 11% of children like to have lays/kurkure/chips, 8% of children like to have soft drinks and only the 4% of children like to have biscuit which is similar studies *of* WHO [1]Failure to use the available resources may be due to a lack of adequate knowledge of what children should and can eat, and especially of the fact that the growing child has a relatively greater need for the scarce protein items in the family diet than the wage earner or the respected elder for whom they are usually reserved. The distribution of food within the family is a potent factor in the nutritional deprivation of children; the belief that only adults should eat meat or other" rich" or " heavy" foods is not restricted to the poverty-stricken or illiterate peasant family, but is also found in many educated communities anxious to do their best for the child, and with the means to do so. In many regions the idea of buying or preparing food especially for the child is totally unfamiliar (Jenkins, S., & Horner, S. D. 2005). Nutrition is a core pillar of human development and concrete, large-scale programming not only can reduce the burden of under nutrition and deprivation in countries but also can advance the progress of nations. Most of the child normally loses about 5-10% of their birth weight which will be compensated by 2 weeks of age. Between ages 1-10 child should normally gain about 2.26 kg of weight. The rate of nutrient consumption in a child is directly proportional to the growth rate. Although nutrient intake can differ from child to child, in general, a healthy child should follow their own individual growth curve. Every parents and caregiver should be aware or responsible of providing wide variety of foods to make sure that the child is getting enough nutrition. An unhealthy eating habit is precursor of different type of infant related diseases or disorders such as type 2 diabetes, high blood pressure and obesity. The level of child under nutrition remains unacceptable throughout the world, with 90 per cent of the developing world's chronically undernourished (stunted) children living in Asia and Africa. Under nutrition is substantially higher in rural than in urban areas. Short birth intervals are associated with higher levels of under nutrition.

The percentage of children who are severely underweight is almost five times higher among children whose mothers have no education than among children whose mother was many years in schooling. Under nutrition is more common for children of mothers who are undernourished themselves (i.e. body mass index below 18.5) than for children whose mothers are not undernourished. Under nutrition effects children's survival, health, growth and development, Optimal infant and young child feeding entails the initiation of breastfeeding within one hour of birth; exclusive breastfeeding for the first six months of the child's life; and continued breastfeeding for two years or more, together with safe, age-appropriate and hygienically prepared complementary foods starting at 6 months of age.

The nutritional status of children from Taulung is based on data collected on nutrition status of the sample. Out of the total children, 44% of children had normal weight and 43% of children were underweight, 11 % of children were overweight and only 2% of children had obesity.

Most of the mothers from Taulung VDC Kathmandu, districts were illiterate and do not have enough knowledge about nutrition. Due to the lack of knowledge about nutrition, child nutrition status has been affected. Socio-cultural status or taboo is also a responsible factor for malnutrition. Mother's belongs from Taulung VDC also does not know the feeding practices. Most of the women in this society were actively involved in socio-economic and cultural practices, mother are not able to give time of their children due to the busy of making local wine.

Nutrition status of children, half of children was normal weight and half of children were underweight because mother was used to feed poor unbalance diet of their children. The low consumption of fruit and fresh vegetables, which is highly dependent on local seasonal availability, contributes to nutritional disorders such as deficiencies in iron and vitamin A. Nutritional disorders including iodine deficiency are

more prevalent in isolated and inaccessible hill and mountain districts in which local food availability is synonymous with local production Almost all mothers was giving junk food/cash to buy junk for their children when they starts to processing wine because they think these kind of food is also good for their child. They do not know the impact of junk food.

A mother in a particular community is very busy person. She finds it difficult to give full attention to the small child at mealtime as well as mother generally knows what the child was give to eat, but she might not know how much her child actually ate. On the other hand a child may simply play with his food, when they were tired or not getting well. When a child has fallen asleep miss his entire meal, it may also lead child under nutrition.

Traditionally in this particular community girls are like to eat especially (TETURA) and boys like to eat HUMPIDUMPI (a kind of noodles) as well as girl's nutritional status was little bit better in comparison to boys. It is interesting to note that the main reason of boys had skipped their meals occasionally.

This is particularly Tamang community although no any such types of food taboos and food restrictions were found. By the observation during the study there was no such gender discrimination in giving pocket money to children, food distribution and teacher's behavior during teaching.

Also, a child develops a natural preference for the food he/she enjoy the most. So the challenge for parents and caregiver will be making healthy choices appealing. No matter how concerned you are about your child's diet, it is always difficult to convince your child to eat an apple a day rather than junk. But, at least we can ensure that whatever diet they consume have nutritional values even though it is part of their favorite junk food. Some of the healthy eating practices as mentioned in "HelpGuide" involve having regular family meals, cooking meals frequently at home, getting kids involve in selecting groceries or preparing dinner, making variety of healthy snacks and limiting portion size. Serving food every day at the same time, while having every member of the family together, enhances eating habit and is uplifting at the same time. Cooking meals frequently avoids restaurant meals that are more fats and serves as a great example of eating at home. Making kids involve in grocery allows them to choose food that they like and they will enjoy eating those food cooked at home. Also, homemade snacks are much healthier than the ones found in the market. Parents shouldn't reward or bride children with food for their good work. These healthy practices might develop good eating habit in children that will certainly avoid nutrition deficiency.

CONCLUSION

The prevalence of under nutrition among children was found to be 43%. It is also concluded that there is significant positive, higher and linear co-relation between feeding practices and anthropometry.

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