International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2016): 79.57 | Impact Factor (2017): 7.296

Nutritional Status of One to Five Year Old Children Admitted at Rangpur Medical College Hospital, Bangladesh

Dr. Md. Zakir Hossain Sarker[1], Dr. Md. Shahidur Rahman Chowdhury[2], Anowar Hossain[3]

[1]Assistant Professor, Dept. of Paediatrics, Rangpur Medical College Hospital, Rangpur, Bangladesh

[2]Assistant Registrar, Dept. of Paediatrics, Rangpur Medical College Hospital, Rangpur, Bangladesh

[3]Project Facilitator, Strengthening Public Health Actions for Emerging Infectious Events in Bangladesh (Global Health Security Agenda), Institute of Epidemiology, Disease Control and Research (IEDCR), Dhaka, Bangladesh

Abstract: ***Malnutrition among one to five year old children is a chronic problem in developing countries. They are most vulnerable group in our country. Objective: This cross sectional study was carried out to assess the nutritional status of one to five year old children in Rangpur Division, Bangladesh. Methods: The parameters were used to evaluate the nutritional status were weight for age, height for age, weight for height Z score and mid upper arm circumference (MUAC). Results: The study documented, the mean age of the children was 3.88±1.10 years and most (86.37%) of children were from 3 to 5 years of age group. Female children were 60% and male children were 40.0%.Near about one third (38.2%) of the mothers were in the age group 18-25 years. The mean age of the mothers was 26.21±4.99 years and age range was 18-38 years. Nearly half (45.5%) of the mothers had a background of primary education whereas more than half (54.5%) of the fathers had a background of primary education. Among the mothers, 74.0% were housewife. Among the fathers, 69.1% were laborer. More than half (58.2%) of respondents were living in nuclear family. Most (81.8%) of the respondents monthly family income were 7000-15000 taka. Most (95.5%) of the children were vaccinated. Maximum (77.3%) mothers took antenatal visit during pregnancy. More than half (54.5%) of the children were born at term and 60.0% deliveries were conducted at hospital.Among the children, 9.1% of the children were severe underweight, 10.9% were severe stunted and 11.8% were severe wasted. According to MUAC, 33.6% were malnourished. Conclusion: These data suggest that about one-third of the children suffer from malnutrition.***

Keywords: Nutritional status, Wasted, Stunted, Underweight, One to five year old children, Malnutrition

1. Introduction

Malnutrition or malnourishment is a condition that results from eating a diet in which nutrients are either not enough or are too much such that the diet causes health problem (*United Nations Children's Fund, 2010*).Malnutrition can be divided into two different types, SAM and MAM. SAM refers to children with severe acute malnutrition. MAM refers to moderate acute malnutrition (Subramanian, S.,*et al.*, 2014).

The rates of malnutrition in Bangladesh are among the highest in the world. Nearly 7 million Bangladeshi children under 5 years of age suffer from malnutrition; 41% are stunted, 36% are underweight, and 16% are wasted *(Bangladesh Demographic and Health Survey, 2011).*Although all administrative divisions were affected by child malnutrition, there were important differences in the prevalence of the three anthropometric indicators. The prevalence of underweight ranged from 49.8% in Khulna to 64.0% in Sylhet which also showed the highest prevalence of stunting (61.4%) and wasting (20.9%). Despite the high levels, rates of stunting have declined steadily over the past 10 years (Nutrition Country Profile-Bangladesh,1999).

The most affected under-nutrition children are in South Central Asia and Sub-Saharan Africa. Approximately 90% of the children affected by stunting live in 36 countries and 80% of these are located in just 20 countries (Nutrition in Developing Countries, 2011).Globally, one quarter of under-five children is stunted (estimated 162 million). South Asia particularly has a high prevalence of stunting (38%), underweight (32%) and alarmingly high percentage of wasting (16%) as compared to other regions in the world (Megha*et al.*, 2014).In fact, Bangladesh has the highest prevalence of child underweight of all countries in the world except North Korea, and only seven countries have a higher prevalence of child stunting (UNICEF, 2002) than that of Bangladesh. More than 54% of preschool-age children equivalent to more than 9.5 million are stunted, 56% is underweight and more than 17% of preschool children are wasted in Bangladesh (FAO, 1999). Though prevalence of "under five" malnutrition has declined steadily from 56% to 47% and "under five" mortality declined from 116/1000 to 88/1000 between the years 1996 to 2004 (BDHS, 2004). Bangladesh is still in the bottom line in the world context. A child's entire life is determined in large measures by the food given to him during his first five years. Childhood is a period of rapid growth and development, and nutrition is one of the influencing factors in this period (Shills *et al.*, 1998).

A number of anthropometric indices have been used successfully for many years to estimate the prevalence of under-nutrition among pre-school children. These include height-for-age, weight-for-age and weight-for-height. Height-for-age is an index of cumulative effect of under-nutrition during the life of the child. Weight-for-age is the combined effects of both the recent and the long-term levels of nutrition, whereas weight-for-height reflects the recent nutritional experiences of the child. These indices are

reasonably sensitive indicators of the immediate and underlying general causes of nutrition (Malik*et al.*, 2006). The risk of mortality is inversely related to children's height-for-age and weight-for-height (Khan, 1993 & Pelletier *et al.*, 1994).

2. Methodology

A descriptive cross sectional study was carried out to evaluate the nutritional status of one to five year old children admitted at the Department ofPaediatrics ofRangpur Medical College Hospital.This study was conducted during the period of one year (January to December 2016). Maintaining selection criteria a total 110 both male & female children were enrolled in the study. The data were collected through face to face interview from the parentsof the children with the help of semi-structured questionnaire and checklist by purposive sampling technique. The semi-structured questionnaire and check list were prepared in view to keep the research question, objectives, and variables considered in the study. They were interviewed after giving informed consent. Weight, height and age data were used to calculate weight for age, height for age and weight for height Z scores based on the National Center for Health Science 2000 reference. A cut-off -2 Z scores was used to define under nutrition.

3. Results

After collection and compilation of data, analysis was done according to the distribution of the variables as required to highlight the research objectives. The data were processed and analyzed by using the software SPSS. Information's were collected from one hundred and ten respondents.

Table 1: Distribution of demographic variables of the children

Demographic variables	Age of the children	Frequency (n=110)	Percentage (%)
Age	<3 years	15	13.6
	3-5 years	95	86.4
Sex	Male	66	60.0
	Female	44	40.0
Mother's age	18-25years	42	38.2
	26-30 years	35	31.8
	31-35 years	22	20.0
	Above 35 years	11	10.0
Mother's education	Illiterate	41	37.3
	Primary	50	45.5
	Secondary	19	17.2
Father's education	Illiterate	32	29.1
	Primary	60	54.5
	Secondary	13	11.8
	Higher Secondary	5	4.6
Mother's occupation	Housewife	81	74.0
	Working mother	29	26.0
Father's occupation	Laborer	76	69.1
	Businessman	26	23.6
	Service holder	8	7.3
Religion	Hindu	82	74.5
	Muslim	28	25.5
Family type	Joint family	46	42.8
	Nuclear family	64	58.2
House type	Kacha	22	20.0
	Tin-shed	78	70.9
	Pacca	10	9.1
Family member	3	33	30.0
	4	43	39.0
	5	18	16.5
	6	16	14.5
Monthly family income	3000-6000 taka	15	13.6
	7000-15000 taka	90	81.8
	16000-20000 taka	5	4.6

Among the children, the mean age was 3.88±1.10 years. Most(86.37%) of the children were found in 3-5 years of age and rest (13.63%)were in<3 years age. Out of 110 children, 44 (40.0%) were male and 66 (60.0%) were female. So, the proportion of female was higher. About one third (38.2%) of the mothers were from age 18-25 years. The mean age of the mothers was 26.21±4.99 years. The minimum age was 18 years and maximum 38 years. Nearly half 50 (45.5%) of the mothers had a background of primary education followed by illiterate 41 (37.3%) and rest19 (17.2%) were educated up to secondary school. Total 60 (54.5%) fathers had a background of primary education followed by illiterate 32 (29.1%), secondary education 13 (11.8%) and the rest 5 (4.6%) completed their higher secondary education. Maximum 81 (74.0%) were housewivesand rest 29 (26.0%) were working mothers. Highest76(69.1%) were laborer, followed by businessman26 (23.6%), and service holder 8(7.3%). Most of the respondents 82 (74.5%) were Hindu and rest 28 (25.5%) were Muslim. More than half 64(58.2%) of the respondents were living in nuclear family. On the other hand, 46 (41.8%) were living in joint family. Maximum 78 (70.9%) were living in tin-shed house, followed by kachahouse (20.0%) and pacca house (9.1%). About one third 43 (39.0%) of them had four members in their family, followed by 33 (30.0%) had three members, 18 (16.5%) had five members and 16 (14.5%) had six members in their family respectively. The mean family member was 4.5±2.05 numbers. Most of the respondents 90 (81.8%) had monthly family income 7000-15000 taka, 15 (13.6%) respondents had monthly family income between 3000-6000taka and only 5 (4.6%) respondents had monthly family income 16000-20000 taka. The mean monthly family income of the respondents was 10431.82±807.77 taka.

Table 2: Distribution of the children by Z score

Z score	Type of score	Frequency (n=110)	Percentage (%)
Weight for age Z score	Normal (-2 to +2 SD)	80	72.7
	Moderate underweight (<-2 SD)	20	18.2
	Severe underweight (<-3SD)	10	9.1
Height for age Z score	Normal (-2 to +2 SD)	80	72.7
	Moderate stunting (<-2 SD)	18	16.4
	Severe stunting (<-3SD)	12	10.9
Weight for height Z score	Normal (-2 to +2 SD)	80	72.7
	Moderate wasting (<-2 SD)	17	15.5
	Severe wasting (<-3SD)	13	11.8
Overall nutritional status	Normal	80	72.7
	Malnourished	30	27.3
MUAC status	Normal (≥12.5 cm)	73	66.4
	Malnourished (≤12.5 cm)	37	33.6

Out of the total 10 children (9.1%) were severely underweight, 20 (18.2%) were moderately underweight and

80 (72.7%) children had weight within normal limit for the age. Among the children, 18 (16.4%) children were moderately stunted,80(72.7%) were within normal height for the age and rest 12 (10.9%) were severely stunted children. Maximum (72.7%) of the children were within normal range and rest (27.3%) children were malnourished. According to MUAC, maximum (66.4%) children were within normal range and rest (33.6%) children were malnourished.

Table 3: Distribution of the children by antenatal care

Antenatal care	Type	Frequency (n=110)	Percentage (%)
Antenatal service	Received	85	73.3
	Not received	25	22.7
Antenatal visit for the respondents	2 times or less	45	52.9
	3 times	27	31.8
	4 times	13	15.3
Term of birth	Birth in term	60	54.5
	Birth before term	50	45.5
Place of delivery	Home delivery	44	40.0
	Hospital delivery	66	60.0

Maximum 85 (77.3%) of the mothers took antenatal service during pregnancy but among them 25 (22.7%) mothers did not take antenatal service. Among 85 mothers,nearly half 45 (52.9%) of the mothers took2 or less time antenatal visit, 27(31.8%) took 3 times antenatal visit and 13 (15.3%) took 4 times antenatal visit. Maximum 60 (54.5%) were born at term and rest50 (45.5%) of them was born before term. Among the mothers, 44 (40.0%) delivery of the respondents were conducted at home and maximum 66(60.0%) delivery were conducted at the hospital, clinic or NGO hospital.

4. Discussion

In the present study, the mean age of the children was 3.88±1.10 years. Most of children 95 (86.37%) were from 3 to 5 years of age group. Out of 110 children, 44 (40.0%) were male and 66 (60%) were female. So, the proportion of female was higher. This data weredissimilarwitha Bangladeshi study (Ahmed *et al*., 2013) also found, male was 52.8% and female were 47.2%. In another Pakistani study (Syed*et al.,* 2015) found 54.8% were male and 45.2% were female. Male children were 54.9% and female were 45.1% found in a Botswana study (Madondo*et al.,* 2012).Among the mothers, near about one third42 (38.2%) were from the age group 18-25 years. The mean age of the mothers was 26.21±4.99 years and minimum age was 18 years and maximum 38 years which is consistent with another study, here mean age of the mother was 26.21±4.985 years and minimum 18 years and maximum 38 years.

Some studies showed that, inBangladesh, increasing paternal education was associated with greater decreases in the stunting than was maternal education (Samba *et al*.,2008).Thus, the relative importance of maternal and paternal education might vary in different settings. It has been observed in my study that, nearly half 50 (45.5%) of mothers had a background of primary education, followed by illiterate 41 (37.3%) and rest19 (17.2%), completed their secondary education. These findings correlate with a study in Egypt (Madondo*et al.,* 2012) which showed that poor maternal education and a low household income contributed to the high prevalence of underweight children. Poorly educated are likely to have malnourished children, mainly due to poor job opportunities and poor basic knowledge on child nutrition (Van de Poel*et al.,* 2007). A study among Serbian children, here mothers with a primary education or less were found to be more than twice as likely to suffer from stunting (OR = 2.2, 95% CI = 0.9, 5.3) (Madondo*et al.,* 2012). The educational level of mothers was positively related to the better nutritional status of the children. Educated mothers are more conscious about their children's health; they tend to look after their children in a better way. In Bangladesh, maternal education was significantly associated with severe malnutrition. This study finding also suggests that, mother's education played a significant role in reducing prevalence of stunting. Chronic malnutrition was highest among children of illiterate mothers.

In this study, maximum 81 (74.0%) were housewives and rest 29 (26.0%) were working mothers. Regarding the educational status, it has been observed that, more than half 60(54.5%)of father had a background of primary education, followed by illiterate 32 (29.1%), secondary 13 (11.8%) and 5 (4.6%) were in higher secondary educational group. This result is quite opposite of the study of Alam (2011) in which, 85% fathers were illiterate.This dissimilarity may due to different time of study conduction and different socio-economic condition.Father's education emerged as an important factor that was significantly associated with underweight status of under-five children. Analysis showed that,children whose fathers had higher level of education were lower in proportion of weight deficiency than those of illiterate fathers.

Among the fathers, maximum 76 (69.1%) were laborer, followed by businessman 26 (23.6%), service holder 7 (7.3%) but the different result found in another study (Muaz*et al*.,2010)here male workers were 40% and female were 60%.This dissimilarity of these result was may be due to time, place and other relevant factors. This study was conducted in 2010 which is 6 years back. Usually father is the main earner and decision maker of the family and so their higher level of education plays an important role to ensure better nutritional status of children.

In the present study, more than half64 (58.2%) of the respondents were living in nuclear family, on the other hand, 46 (41.8%) were living in joint family. A number of studies have found that, family size has different effects on the nutritional status of children. A study in Ethiopia (Madondo*et al.,* 2012) found that, family size was connected to underweight and stunting among children and those children from bigger households were more vulnerable to malnutrition. Big polygamous families perhaps protected their children against malnutrition. This finding could be attributed to mutual support in these families in these regions. Findings in other regions showed that large households were more likely to have malnourished children. This could be attributed to less food being available in bigger households without adequate family support systems. They also showed in their study that, the children from smaller households are more likely to be malnourished in urban areas.(Madondo*et al.,* 2012)

This study revealed that,among the respondent's, maximum 78 (70.9%) were living in tin-shed house, followed by kacha house 22 (20.0%) and pacca house 10 (9.1%). Almost similar findings were found in the study by Alam (2011), in which, 16.2% respondents lived in pacca house and 81% respondents lived in tin-shed house which is higher than this study result. This dissimilarity of the result may be due to time and different group of study population.

Regarding family member, among the respondents, about 43 (39.0%) of them had four members in the family, followed by three members in 33 (30.0%), five members in 18 (16.5%) family and six members in 16 (14.5%) family respectively. This results is consistent with the study of Alam (2011) in which, about 39.04% families had four members.

Finding of the present study showed that, most 90 (81.8%) of the respondent's monthly family income were7000-15000taka, followed by 15 (13.6%) respondent's monthly income between 3000-6000 taka and only 5 (4.6%) respondents, monthly income 16000-20000 taka. This finding is consistent with low income people of Bangladesh. About 50% of our people earn less than 1.25 US dollar per day and remains below international poverty line (Muaz*et al.,* 2010). Low family income as a possible risk factor of acute malnutrition in case of wasted children under 2 years old was reported by Ahmed (2013). Studies of child malnutrition in developing countries in sub-Saharan Africa, Latin America and the Caribbean, South and Southeast Asia and the Eastern Mediterranean, have shown that stunting was variously prevalent among the poor because of small differences in socioeconomic status, and that wasting was generally more common among the poor (Van dePoel*et al.,* 2007).

Bangladesh has achieved a fairly high coverage of vitamin A supplementation in under-five children and has been successful in eliminating night blindness. Out of 110 children,in the present study, maximum83 (75.5%) had positive history of vitamin A intake and rest 27 (24.5%) of the children did not take vitamin A till the date of interview. Vitamin A deficiency (VAD) in pregnant woman has been reported in some studies and only one in five mothers receive postpartum vitamin A supplementation (Ahmed *et al.,* 2012).

Finding of the study revealed that, most (95.5%)of the children were vaccinated as per EPI schedule, rest 5 (4.5%) did not give vaccine. In Multiple Indicator Cluster Survey, Bangladesh 2006 showed that, the proportion of 12-23 months old,which are fully immunized was 81% and this study showed, 95% of children are fully vaccinated as per EPI schedule (Muaz*et al.,* 2010) which is consistent with my study.

In this study, highest 80 (72.7%) children had weight within normal limit for the age followed by 20 (18.2%) were moderately underweight and 10 (9.1%) of the children were severely underweight. According to BDHS (2014) found 33% children are underweight which was almost similar with this study.

In the present study,among the children, 18 (16.5%) were moderate stunted, 80 (72.7%) were within normal height for age and rest 12 (10.9%) were severe stunted children. According to BDHS (2014) found, 36.2% children are stunted which was almost similar with this study.

In the present study, moderately wasted children were 17 (15.5%) followed by normal weight for height were 80 (72.7%) and rest 13 (11.8%) were severely wasting children. In a study of BDHS(2014) found, 15% children are moderately wasted, which was similar with my study. But severely stunted were 3% which was dissimilar finding with the present study may be due to the time period of the study conducted.

Overall nutritional status according to the majority of the children,80 (72.7%) were normal and rest 30 (27.3%) children were malnourished. Similar results were found in the report of Child Nutrition Survey (2005), published by Bangladesh Bureau of Statistics that 31.8% children were undernourished.

It has been revealed that,according to MUAC, maximum 73 (66.4%) were normal and rest 37 (33.6%) children were malnourished. In the study of Muaz (2010)showed that the mid upper arm circumference of the studied more than half (57%)of children were malnourished which was quite dissimilar with the present study and may be due to variation in place and number of study population. There was no marked difference among male and female child.But there was statistically significant difference among wasting, stunting and underweight in the children of tea workers from that obtained from recent national survey like Bangladesh Demographic and Health Survey(BDHS, 2007).Nutritional status based on the(WAZ, HAZ and WHZ) Z score with the sex of the children showed that, female children were more malnourished than male children. In cross association, therewas significant difference found for nutritional statusbased on(WAZ, HAZ and WHZ) Z score with sex of the children in this study.

In the present study, among the mothers, maximum 85 (77.3%) took antenatal visit during pregnancy but still25 (22.7%) mothersdid not take antenatal visit. Among 85 mothers,near about half 45(52.9%) of them took 2 or less visit, followed by 3 times visited by 27(31.8%) and 4 times visited by 13 (15.3%). In this study,maximum 60 (54.5%) children were born at term and rest 50 (45.5%) of them were born before term.

Among the mothers,most (66.0%)of the delivery were conductedat hospital, rest 44 (40.0%) delivery were conducted athome.This finding is consistent with the real picture of the rural community of Bangladesh.

5. Conclusion

The nutritional status of under-five children is not only a susceptible indicator of the health and nutrition of a country but also can be considered as a measurement of the quality of life.The overall nutritional status was within normal range based on weight for age,height for age,weight for height Z score and mid upper arm circumference.As maximum

parents were educated up to the primary level and majority of the mothers took antenatal services and maximum preferred hospital delivery.Again most of the children took vaccine according to EPI schedule and maximum children took vitamin A supplement and also took anthelminthic drug. These may influence the overall nutritional status of the children. In this study,the prevalence of under-weight, stunting, wasting was lower than nationwide data.If their economic status and educational level, awareness about nutritive food improve the overall nutritional status will also improve further. Yet malnutrition is still an important health problem in the rural community of the northern part of Bangladesh. Thusprogrammes should be undertaken to ensure better health of one to five year old children of the children of Rangpur division for their optimum development which enhance future development of the nation.The children are the future nation builder of the country.

6. Recommendations

Following recommendations are suggested on the basis of the study findings:

- Mothersof the malnourished child should be counseled about food supplementation, breast feeding, proper weaning practice etc.
- Proper dietary management for the malnourished children.
- F-75 diet should be taken for the malnourished children
- Vitamin and nutrient supplementation for the malnourished children

7. Limitations of the Study

- The study was conducted in a selected Medical College Hospital of Bangladesh which may not represent the exact picture of whole Medical College Hospital of Bangladesh.
- The sample size was not adequate due to the data were collected from the admitted patient ofPaediatrics Department.
- The study was due to resource constrained.

References

[1] Ahmed, A.U., Ahmed, T., Uddin, M.S., Chowdhury, M.H.A., Rahman, M.H., Hossain, M.I. (2013).Outcome of standardized case management of under-5 children with severe acute malnutrition in three hospitals of Dhaka city in Bangladesh.*Bangladesh J Child Health.*Vol. 37, No.1, pp. 5-13.
[2] Bangladesh Demographic and Health Survey (BDHS) 2007,NIPORT, Bangladesh.
[3] Bangladesh Demographic and Health Survey (BDHS) 2011,NIPORT, Bangladesh.
[4] Bangladesh Demographic and Health Survey (BDHS) 2014,NIPORT, Bangladesh.
[5] Child Nutrition Survey (2005).Bangladesh Bureau of Statistics.
[6] FAO (1999).*Nutrition country profile: Bangladesh*. FAO, Rome.
[7] Khan, M.E. (1993).Cultural determinants of infant mortality in India.*JFam Welfare*. Vol. 39, No. 2, pp. 3-13.
[8] Madondo A., MacIntyre, UE.,Ntuli,B. (2012). The clinical and anthropometric profile of undernourished children aged under 5 admitted to Nyangabgwe Referral Hospital in Botswana, *Afr J CH.* Vol.6, No. 4, pp. 123-127.
[9] Malik, A.S, Mazhar, A.U. (2006). Assessment of nutritional status of children under 48 months of age.*PakPaed Jr*. Vol. 30, No. 1, pp. 38-47.
[10] Megha, S.,Mamulwar, Hetal, K.,Rathod, Sumit, Jethani., Anjali,Dhone., Tanu, Bakshi., Balkrishna, Lanjewar., Sudhir, Jadhav., Jitendra, S,Bhawalkar.(2014). Nutritional status of under-five children in urban slums of Pune.*International Journal of Medicine and Public Health*.Vol.4, No.3.
[11] Muaz, S.S.A., Hasan, R.M., Shamim, S.A., Dev, A., Kamar, S. (2010).Nutritional Status of 1-5 Years Children of the Tea Workers in SylhetDivision.*Bangladesh J Child Health*. Vol. 34, No. 1, pp. 11-16.
[12] Pelletier, D.L., Frongillo, E.A., Scroeder, D.G., Habicht, J.P. (1994).A methodology for estimating the contribution of malnutrition to child mortality in developing countries.*JNutr*.Vol.124, pp. 2106-22.
[13] Poverty Reduction Begins With Children, 2010. United Nations Children Fund,pp. 72.
[14] Sathish,Subramanian.,Sayeeda, Huq., Tanya,Yatsunenko., Rashidul, Haque., Mustafa,Mahfuz., Mohammed, A,Alam.(2014). Persistent gut microbiotaimmaturity in malnourished Bangladeshi children. Nature Publishing Group.Nature, Vol. 510.
[15] Syed Tariq, A., Suhail, Ahamad, Naik.,Wasim, Rafiq, A., Rehana, Saleem.(2015).Demographic, clinical profile of severe acute malnutrition and our experience of nutrition rehabilitation centre at children hospital Srinagar Kashmir.*International Journal of Contemporary Pediatrics.*Vol.2, No. 3, pp. 233-237.
[16] Semba, R.D., de Pee, S., Sun, K., Sari, M., Akhter, N.,&Bloem, M.W. (2008). Effect of parental formal education on risk of child stunting in Indonesia and Bangladesh: a cross-sectional study. *Lancet*. Vol. 371, No. 9609, pp. 322-28.
[17] Shills, M.E., Young, V.R. Ed. (1998).Modern nutrition in health and disease.*Philadelphia: Lea and Febiger*. pp. 50-58.
[18] UNICEF (2002).*State of the world's children*.Leadership. UNICEF, New York.
[19] Van de Poel, E., Hosseinpoor, A.R., Speybroeek, N., Van Ourti, T., Vega, J. (2008).Socioeconomic inequality in malnutrition in developing countries.*Bull World Health Organ.*Vol. 86, pp. 282-91.