Original Research Article

Nutritional Status of Underprivileged Children: A Study of Bal Ashram, RS Pura, Jammu

Prof. Jasbir Singh[1], Dr. Archana Bhat[2]

[1]Director, [2]Research Assistant,
Centre for Study of Social Exclusion and Inclusive Policy, University of Jammu

Corresponding Author: Dr. Archana Bhat

ABSTRACT

Low height for- age or stunting reflects a failure to reach a minimal stature as per standard norms, is a key indicator of chronic under nutrition. Stunted children suffer from impaired growth with permanent health consequences in their adult life, and face a high risk of morbidity and mortality (Goudet et al., 2015). The present study was conducted in Bal Ashram, Ranbir Singh Pura, Jammu District, where inmates of Ashram were assessed for anthropometric and nutritional status. 50 inmates including 36 boys and 14 girls (3-18 yrs of age) were taken for the study. Anthropometric status was checked by using standardized anthropometric methods and nutritional status was assessed by 24 hour recall diet dairies. Results revealed that though mean Body Mass Index (BMI) was normal but height for age and weight for age was less than standard norms taken (NCHS, 2010). It was also found that average calories intake by respondents was far less than required dietary allowances. More health programs focusing on good nutrition is the need of hour to create awareness about nutrition and health.

Key Words: Health, Slum, Anthropometry, Nutrition, Stunted

INTRODUCTION

In the life cycle of a *homo sapiens* organism, adolescence is a period of transition from childhood to adulthood. It is characterized by rapid physical, biological and hormonal changes resulting in psychosocial, behavioral and sexual maturation between the ages of 10-19 years in an individual. Adolescence is often described as a phase of life that begins in biology and ends in society (Sharma, 1996). The adolescent period is characterized by its rapid physical and psychological changes in the individual, together with increasing demands from and influence of peers, school and wider society. It is well documented that behaviours developed during this period influence health in adulthood (Khan, 2000). Adolescence is characterized by a strong tendency to experiment with risk behaviour. The desire for novelty and the courage for experiment are much greater in adolescence than in later life (Miles et al., 2001).

The children especially teens are generally expected to enjoy sound health being less vulnerable than the very young or very old. But the real portrait is somewhat different. Inadequate diet and unfavorable environments in developing countries may adversely influence the growth and nutritional status of children (Bhattacharyyal and Barua, 2013). According to estimates in developing

countries (1996- 2005), approximately 146 million children are underweight. Of these 57 million children live in India (UNICEF, 1997). NFHS-3 (2005- 06) states that 43% of children below the age five years are underweight for their age. However, it does not highlight the prevalence of underweight among school-aged children (Children in India - A Statistical Appraisal, 2012). Studies conducted by different authors in India conducted the prevalence of underweight in school-aged children as around 50% (Kumar and Jose, 2014).

There are different methods to diagnose the malnutrition in an individual based on his/her anthropometry, body mass index and visible signs and symptoms of nutritional deficiency. The classification based on weight for age, height for age, and weight for height are chiefly devised for quantifying the prevalence of under-nutrition in under-five children. According to the WHO, Body Mass Index (BMI) is a more appropriate marker of underweight, overweight or obesity in an older child (International Institute of Population Sciences (IIPS) National Family Health Survey (NFHS-3), 2007). The WHO currently recommends using BMI for age compared to reference standards (NCHS) and defines under-nutrition as <5th percentile of BMI for age (WHO, 2000).

Growing children are a unique population with specific health concerns and needs. Adolescence is an important time for establishing the social position of an individual (Sarkova et al 2013). Adolescence is the peak age of onset for serious mental illness like depression and psychosis. Over load of stress from physical, emotional, social and sexual change makes children overloaded with stress which can result in anxiety, withdrawal, aggression, poor coping skills which result in actual physical illness (Ganatra et al., 2008). Although a number of studies from India have been published on

children and adolescents' anthropometry among school children from urban and rural settings highlighting prevalence of under nutrition ranging from 17% to 65% (Kumaravel et al. 2014), there are merely a few studies conducted on the nutritional status of adolescents from Bal Ashram Orphanages covering those kids which really need attention and concern from all sections of the society. Highlighting the problems related to nutrition and anthropometric growth among such underprivileged group may attract the attention of many health workers, policy makers and NGOs towards them. Such children need special reflection since they suffer from unfavorable living conditions, when compared to other children who live under parents' affection, guidance and care.

OBJECTIVES
- ❖ Assessment of the anthropometric characteristics of sample adolescents
- ❖ Assessment of nutritional intake among sample adolescents

RESEARCH METHODOLOGY
The research design adopted to meet the objectives of the study is described below:

SAMPLE GROUP: the sample comprised of children residing in Bal Ashram, Ranbir Singh Pura (R.S.Pura), Jammu District through purposive sampling.

Criteria for sample selection:
1. Only respondents who were in age group of 3-18years were chosen for the study.
2. Only respondents who presently live in Bal Ashram were selected for the study.

LOCALE OF STUDY: The study was conducted among children belonging to Bal-Ashram of Jammu district. Present Bal Ashram was chosen through random sampling procedure. 50 children (36 boys and 14 girls) were chosen from the study based on criteria of the study.

TOOLS FOR THE STUDY:

Anthropometric instruments [standardised weight machine, standardised anthropometric rod	• Height • weight • Body Mass Index (BMI)
24 hour Diet diaries	• Dietary habits

Anthropometric characteristics

Anthropometric measurements are widely used measure to assess health status. They are concerned with the measurement of the various physical dimensions and gross composition of human body. Lambert Qutlet (1935), the Belgian astronomer and statistician was the person who coined the word anthropometry which is now universally accepted method of physical growth studies. In the present study, anthropometric measurements were used for assessing the health status of adolescents:

Height – Height of the adolescents was measured by using a standard anthropometric rod. The adolescents were asked to stand erect barefooted, with feet together and heels back against the wall. A slight upward pressure was applied below mastoid process to make Frankfurt plane horizontal. A piece of cardboard was used for crushing hair gently and mark made on wall. Reading was be taken by placing the tape from edge of wall to the mark. The recording was taken to the nearest 0.5 cm.

Weight – To record the weight a portable weighing scale was used. The subject was made to stand on the said machine barefooted. Weight was also recorded to nearest 0.5 kg.

BMI – After recording height and weight of the sample, body mass index was calculated using Quetelet's index / formula: BMI = weight (kg) / height (m)^2

In order to bring on greater degree of authenticity calculations were compared with national and international standards.

24 Hour Diet diaries

The 24-hour diet recall method is a type of nutritional assessment that is often used in nutrition research. Twenty-four hour diet recalls are useful for research that aim to gather nutritional information from individuals, but it also allows researchers to assess what types of foods are being consumed by individuals in a specific community. The interview style of the recall allows participants and researchers to interact and discuss food and food types during the interview. This can often give the researcher rich contextual and ethnographic data to accompany the quantitative nutritional assessment. The ability to record consumption behaviors and then analyze foods for nutritional content is a valuable tool for researchers who do work with nutritional assessment. This method is useful for individual nutritional assessment because it requires little equipment and takes between 30 and 60 minutes to complete. When aiming to gather nutritional information, this method provides a way for the researcher and interviewee to interact while completing the recall. This method gives the researcher a chance to use memory-jogging techniques and to use props to obtain accurate measurements.

DATA ANALYSIS

Data analysis has multiple facets and approaches, encompassing diverse techniques under a variety of names, in different business, science, and social science domains. Many methods were employed in present research to obtain results. The results were presented in the form of figures and tables where ever possible and suitable statistical test was employed. Statistical package for social sciences (IBM SPSS 20) was done for statistical analysis. Descriptive statistics like frequencies, percentages, mean and standard deviation. T test was used for inter gender

differences. Correlation test was employed to obtain any association between the variables.

RESULTS AND DISCUSSION

The results of the study have been presented under different sections, each focusing on the objectives of the study. The results have been presented by illustrations in the form of tables and figures. The analysis is divided into the following:

- Assessment of Anthropometric characteristics among sample children
- Assessment of Nutritional intake among sample children

Assessment of Anthropometric characteristics among sample children

Anthropometry involves the systematic measurement of the physical properties of the human body, primarily dimensional descriptors of body size and shape (Ariful et al., 2001). Modification in lifestyles, nutrition, and ethnic composition of populations lead to changes in the distribution of body dimensions, and require regular anthropometric checkups.

Table 1: General Characteristics of Inmates

General characteristics	Boys (36) x̄±σ	Girls (14) x̄±σ	t value
Height (mean) in meters	139.21±17.77	136.88±19.01	0.81
Weight (mean)in Kgs	39.08±11.13	32.30±9.57	1.60

Table 1 reveals general physical characteristics of sample children. It was observed that mean height of boys across age was 139.21 and that of girls was 136.88. Mean weight of sample boys across age was 39.08 and 32.30 for sample girls. There was no significant difference found across gender for height and weight. This may be attributed to mean height and weight taken from age group as small as 3yrs to late adolescent i.e. 18 yrs.

Table 2: Anthropometric Measurements of Sample Children among Different Age Groups and Gender

Age Group	Frequency (N)		Weight (in Kgs)			Height (in meters)		
	Boys (36)	Girls (14)	Boys (36)	Girls (14)	t value	Boys (36)	Girls (14)	t value
3-6 yrs	5 (13.88%)	1 (7.14%)	20.60± 5.12	16.20	1.91 P value: 0.12	112.8± 13.44	93	3.39** P value: 0.03
6-9 yrs	4 (11.11%)	0	25.20± 6.37	0	-	121.50± 8.96	0	-
9-12 yrs	9 (25%)	3 (21.42%)	27.75± 4.74	28± 7.57	0.15 P value: 0.88	129.12± 11.96	126± 15.37	0.37 P value: 0.74
12-15 yrs	16 (44.44%)	5 (35.71%)	38.43± 6.06	42± 4.35	0.16 P value: 0.88	148.68± 12.76	143± 4.24	4.18** P value: 0.02
15-18 years	2 (5.55%)	5 (35.71%)	48.50± 0.70	47.2± 6.68	0.57 P value: 0.60	170± 7.07	151± 4.32	10.97** P value: 0.00

Table 2 depicts anthropometric measurements of sample children across distributed age groups and gender. It was seen that boys from age group of 9-12 years were maximum in number and girls from age group of 12-15 years were more in number. The more number of girls in this age group may be because of Nari Niketan being merged with this ashram where the girls rescued from trafficking were safely kept. There was significant difference between age group (3-6yrs; 12-15yrs; 15-18yrs) for height among boys and girls, where boys were taller than girls of their age.

Table 3: Anthropometric measurements of sample adolescent Boys in relation to National centre for health and statistics (NCHS, 2010)

Age Group	Weight (in Kgs)			Height (in meters)		
	Sample Boys N= 18	NCHS Value	t value	Sample Boys N= 18	NCHS Value	t value
12-14yrs	30.75± 5.20	49.14	5.49**	150.68± 10.76	160.19	2.56**
14-16yrs	40.43± 4.06	61.50	14.46**	165± 9.05	171.54	8.32**
16-18yrs	50.50± 0.60	69.06	41.12**	170± 7.07	175.61	1.12

Table 3 depicts anthropometric measurements of sample adolescent boys and their comparison with standard norms (NCHS, 2010). It was observed that sample boys were having less weight in all age groups than the recommended standards. Even boys were not as tall as they should be, as per NCHS norms. There was significant difference in height and weight, when compared with NCHS values. This may be due to low calorie intake among sample adolescents. There was no significant difference found among boys in age group 16-18yrs in height. This may be attributed to growth spurt among boys at this age.

Table 4: Anthropometric Measurements of Sample Adolescent Girls in Relation to National Centre for Health and Statistics (NCHS, 2010)

Age Group	Weight (in Kgs)			Height (in meters)		
	Sample group	NCHS Value	t value	Sample group	NCHS Value	t value
12-14yrs	35±7.57	50.86	4.54**	136±15.37	158.86	7.47**
14-16yrs	45±8.35	56.61	7.49**	147±4.64	162.24	9.07**
16-18yrs	50.2±7.68	59.32	4.05**	155±8.32	163.99	2.94*

Table 4 highlights anthropometric measurements of sample adolescent girls and its comparison with standard norms (NCHS, 2010). It was observed that girls were having less weight for age and less height for age, though the ratio of weight and height (BMI) was normal but stature of sample girls was short. Significant difference was found for height and weight for age among sample girls when compared with standard values (NCHS).

Table 5: Body Mass Index (Percentiles) among Sample Children across Different Age Groups

AGE GROUP	Body Mass Index percentiles							
	Underweight (< 5th Percentile)		Healthy weight (5th -84th percentile)		Overweight (85th -≤ 95th percentile)		Obese (≥ 95th percentile)	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
3-6 yrs	0	0	5(100%)	1(100%)	0	0	0	0
6-9 yrs	1(25%)	0	3(75%)	0	0	0	0	0
9-12 yrs	2(22.22%)	0	6(37.5)	3(100%)	1(11.11%)	0	0	0
12-15 yrs	6(37.5%)	0	9(56.25%)	5(100%)	1(6.25%)	0	0	0
15-18 yrs	1(50%)	0	1(20%)	5(100%)	0	0	0	0

t -Value(calculated from raw data): 2.02*
*figures in parenthesis represent percentages from actual number of boys and girls in the different groups
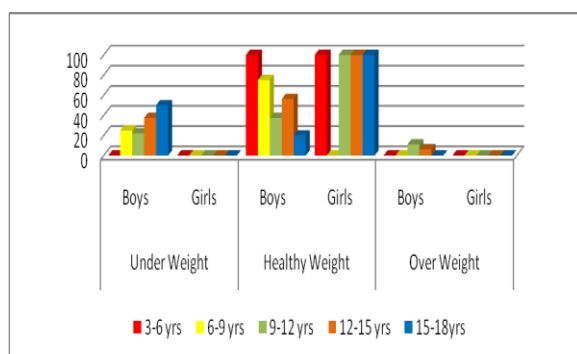

Figure 1: Body Mass Index (Percentiles) among Sample Children across Different Age Groups

Table 5 represents Body Mass Index (Percentiles) among sample children across different age groups. It was seen that under weight and obesity were both prevalent in boys, contrary to many international and national studies, where as girls were found to be underweight than boys of same age group. Sample girls were not in underweight and overweight category; this was attributed to their low stature and less weight for age.

Figure 1 highlights that adolescent boys were gaining height but losing weight, may be due to less recommended calorie intake as compared to other age groups. Statistical difference was found significant for BMI among sample children across gender.

Assessment of Nutritional Intake Among Sample Children

In India, the first attempt to define nutrient requirements and desirable dietary intakes of nutrients for Indians to maintain good health was made by the Nutrition Advisory Committee of the Indian Research

Fund Association [Now Indian Council of Medical Research (ICMR)] in 1944 (National Academy of Science, 1989 cited Misra et al., 2011). It is well recognized that nutritional status is a key determinant of health among youngster and there is no doubt regarding the importance of the study of nutritional status (NFHS2, 2000). This section presents calorie intake per day by sample groups.

Table 6: Calories intake among Sample Children across Different Age Groups

Age Group	Mean Calories(kcal) intake per Day		
	Boys	Girls	t value
3-6 yrs RDA (NIN, 2010): 1350 kcal/day	1165±287.45 t : 1.57	749 t : 8.14**	3.54**
6-9 yrs RDA (NIN, 2010): 1690 kcal/day	1314±190.26 t : 4.41**	0	-
9-12 yrs RDA (NIN, 2010) Boys: 2190 kcal Girls: 2010 kcal	1273±306.89 t : 8.18**	1059±207.90 t : 13.62**	1.52
12-15 yrs RDA (NIN, 2010) Boys: 2750 kcal Girls: 23350 kcal	1525±334.04 t : 14.66**	1184±204.36 t : 23.72**	3.29**
15-18 years RDA (NIN, 2010) Boys: 3020 kcal Girls: 2440kcal	1542±25.45 t : 18.36**	1293±244.96 t : 10.46**	2.45*

Table 6 represents calories intake among sample children across different age groups. It was observed that sample children were consuming much less calories than the recommended dietary allowances (NIN, 2010). Gap in calories intake and recommended calorie intake among children was found to widen with increase in age. Even girls were consuming less calories than their boys' counterpart.

A Statistical significant difference was found between actual intake and recommended dietary allowances (RDA) per day among sample children. Statistical significant difference was also found for calorie consumption per day across gender in which boys were consuming more calories than girls.

Concluding comments

Understanding the health concerns among under privileged can provide an opportunity to focus resources, interventions and research in directions that would be most beneficial in addressing the problems. Table 7 highlights major findings of study and its comparison with previous available data.

Table 7: Comparison of Present Findings with available Data

Present research Anthropometric Characteristics of Sample Adolescents	Previous researches		
	Author	Place of study	Findings
With increase in age, height and weight was found increased significantly.	Mishra et al. (2014)	Assam, India	Stunting and malnutrition in found two communities- Mishing tribe and Kaibarta
It was observed that sample boys were having less weight in all age groups than the recommended standards. Even boys were not as tall as they should be, as per NCHS norms.	Sen and Mondal (2012)	Bengal	Investigated 726 school going adolescents belonging to the Rajbanshi, Bengali Muslim and Bengali Caste communities. There was a significant difference in the prevalence of under nutrition in terms of age and sex amongst them.
Girls were having less weight as per age and less height as per age, though the ratio of weight and height (BMI) was normal but stature of sample girls was short. Significant difference was seen in anthropometric characteristics between girls and boys, where boys were taller and heavier than their girls counterparts. Underweight and obesity were both prevalent in boys. Sample girls were not in underweight and overweight category, this was attributed to their low stature and less weight at age.	Rawat et al. (2014)	Meerut, U.P.	The Cross sectional Study was done in an urban slum area in Meerut city over a period of Five months (February 2011- June 2011) among children in the age group of 5-14 years. Sample Size was Four hundred and Sampling Technique used was Simple Random Sampling. Data was collected by conducting house to house visits, measuring height and weight of children and also through interview using a structured questionnaire. The prevalence of underweight in children was found to be 48.0%. 56% of the undernourished children were boys. Significantly
	Singh and Devi (2013)	Manipur	There was high prevalence of both underweight and overweight status among adolescents, but overweight was more dominant in girls and underweight was more prevalent in boys.

Table 7 to be continued…			
<u>Assessment of Nutritional Intake Among Sample Children</u> Sample children were consuming much less calories than the recommended dietary allowances (NIN, 2010) Girls were consuming less calories than their boys counterpart.	Deka et al. (2015)	Jhansi district, Uttar Pradesh	A cross-sectional study was conducted among adolescents in urban areas. More than half of the children studied had malnutrition. Mean intake of calories, fat, iron and vitamins were lower than RDA.
Statistically significant difference was found between actual intake and recommended dietary allowances (RDA) per day among sample children.	Wasnik et al. (2012)	Andhra Pradesh, India	A total 420 girls (10-15 yrs) were studied. Girls were found to suffer from chronic energy deficiency grade I, II and III were 25.2%, 15.2% and 16 % respectively. 2.9% was found to be overweight and none of the girls was found to be obese.
Statistically significant difference was also found for calorie consumption per day across gender in which boys were consuming more calories than girls.	Bhoite & Iyer (2011)	Gujarat	The study assessed the nutritional status of urban and rural adolescents of Vadodara district and found the determinants of malnutrition. Anthropometric measurements, dietary history, activity pattern were collected on a sample of 376 children. Location specific factors that influence adolescence nutritional status and lifestyle were studied. There were 120 urban and 256 rural students. The overall prevalence of obesity ranged from 0.4-0.8 % in rural setup and 0.8-3.3 % in urban setup. Thus dual burden of malnutrition was seen in both the settings. With regard to dietary assessment, it was seen that nutrient intake of the adolescent children was grossly inadequate in relation to energy, protein, iron and fiber.

Suggestions and Implications

The following broad based suggestions were evolved on the basis of the present study:

o Health education regarding dietary habits and sedentary life style should be given to caretakers, adolescents and teachers.

o More ashram based intervention programs should be conducted to make children, caretakers and institutional officers' staff aware of healthy lifestyle. Curricular changes should be made to inculcate Regular exercise or games. Awareness activities focusing on health risks should be part of school and residential curriculum.

o More intervention modules should be developed focusing on healthy lifestyle.

o Mass media should get involved in educating people about healthy lifestyle and health risks associated with unhealthy lifestyle.

o More health programmes focusing on health risks and lifestyle among adolescents should be done by Government agencies and NGOs.

o Quality of food and its quantity should be assured by Government agencies and actual consumption of children should be recorded by officers concerned.

o Universities or Centres of higher educations should be involved to create awareness among the stake holders.

REFERANCES

• Goudet.S.M., Griffith.P.L.,Bogin.B.A., Madise.N.J.2015. Nutritional Interventions For Preventing Stunting in Children (0-5years) Living in Urban Slums. *Cothrane Public Health Group,* 1-4.

• Sharma, N. 1996. Identity of the adolescent girl. New Delhi: Discovery Publishing.

• Khan A. 2000. Adolescents and Reproductive Health In Pakistan: A Literature Review. The Population Council, Pakistan Office.

• Miles, J., & Shevlin, M. 2001. *Applying regression and correlation: A guide for students and researchers*. Sage.

• Bhattacharyyal, H., & Barua, A. 2013. Nutritional Status and Factors Affecting Nutrition Among Adolescent Girls In Urban Slums Of Dibrugarh, Assam. *National Journal of Community Medicine*, 4(1), 35-39.

• Bellamy, C. 1997. The State Of The World's Children 1997. United Nations Children's Fund, UNICEF. Oxford University Press, 1-109.

• MOSPI. 2012. Children in India—2012: A Statistical. Appraisal, Report by the Ministry of Statistics and Programme Implementation Government of India.

- Mutua, R.N., Keriko, J., Mutai, J. 2017. Factors Associated With Stunting, Wasting And Underweight Among Children Aged 2-5 Years In Early Childhood Development And Education Centers In Masinga Sub County, Machakos County. *European Journal of Health Sciences*, 1(2);44-69;2017.
- International Institute for Population Sciences. (2007). *India National Family Health Survey (NFHS-3), 2005-06* (Vol. 1). International Institute for Population Sciences.
- World Health Organization. (2000). *Obesity: preventing and managing the global epidemic* (No. 894). World Health Organization.
- Sarkova, M., Bacikova-Sleskova, M., Orosova, O., Madarasova Geckova, A., Katreniakova, Z., Klein, D., & van Dijk, J. P. (2013). Associations between assertiveness, psychological well-being, and self-esteem in adolescents. *Journal of Applied Social Psychology*, *43*(1), 147-154.
- Ganatra, H. A., Zafar, S. N., Qidwai, W., & Rozi, S. (2008). Prevalence and predictors of depression among an elderly population of Pakistan. *Aging and Mental Health*, *12*(3), 349-356.
- Kumaravel, V., Shriraam, V., Anitharani, M., Mahadevan, S., Balamurugan, A. N., & Sathiyasekaran, B. W. C. (2014). Are the current Indian growth charts really representative? Analysis of anthropometric assessment of school children in a South Indian district. *Indian journal of endocrinology and metabolism*, *18*(1), 56.
- Ariful, M.D., Islam, M.D., Asadujjaman, M.D., Hussain, M. (2001). Ergonomics consideration for hospital bed design: A case study in Bangladesh". Journal of Modern Science and Technology, 1 (1), 30-44.
- National Family Health Survey (NFHS 2). Chhattisgarh (1998–1999). Mumbai; International Institute of Population Sciences, 2002.
- Mishra, K., Kumar, P., Basu, S., Rai, K., & Aneja, S. (2014). Risk factors for severe acute malnutrition in children below 5 y of age in India: a case-control study. *The Indian Journal of Pediatrics*, *81*(8),762-765.
- Sen, J., & Mondal, N. (2012). Socio-economic and demographic factors affecting the Composite Index of Anthropometric Failure (CIAF). *Annals of human biology*, *39*(2), 129-136.
- Rawat, R., Kumar, S., Manju, L., & Jose, R. (2014). Prevalence and Determinants of Under-nutrition among School-aged Children in an Urban Slum in India. *Academic Medical Journal of India*, *2*(3), 102-105.
- Singh, M. S., & Devi, R. K. (2013). Nutritional status among the urban Meitei children and adolescents of Manipur, Northeast India. *Journal of Anthropology*.
- Deka, M. K., Malhotra, A. K., Yadav, R., & Gupta, S. (2015). Dietary pattern and nutritional deficiencies among urban adolescents. *Journal of family medicine and primary care*, *4*(3), 364.
- Wasnik, V., Rao, B. S., & Rao, D. A. (2012). Study of the Health Status of Early adolescent Girls residing in Social Welfare Hostels in Vizianagaram district of Andhra Pradesh State, India. *Int J Collaborative Research on Internal Medicine & Public Health*, *4*, 72-83.
- Bhoite, R., & Iyer, U. (2011). Operational Research on Mid Day Meal Program And Its Outcome On Growth Of School Children In Rural Area. *International Journal of Applied Biology and Pharmaceutical Technology*, *2*(2), 448-453.

******