# IMPACT OF ENVIRONMENTAL PARAMETERS AFFECTING NUTRITIONAL STATUS OF PEOPLE IN TSUNAMI COLONY

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## ABSTRACT

Nutrition is one of the primary aspects in today's life style. We need better nutrition to stay healthier. Thoothukudi is the coastal town with rich sea foods. But the people those who are living in this Tsunami colony are unable to afford because of their poor economic status. The environmental variables studied in the present investigation demonstrate an association between malnutrition and development. The highest prevalence of malnutrition was reported in males than the females of the age group between 6-59 months in the present study.

## KEY WORDS

Malnutrition, Malnourished, Stunting

## INTRODUCTION

Food means not only proteins, fats, minerals, vitamins and other nutrients but much more: it is part of security and civilization. Nation and civilizations are linked together not only by ideas, but also by bread. Hunger and malnutrition are problems everywhere and have harassed mankind and threatened peace throughout history. It is no wonder that the growing incidence of hunger and malnutrition should have come to the forefront of international concern [1]. Nutrition is the cornerstone of socioeconomic development of a country. It is an essential component of millennium development goals. Child malnutrition impacts cognitive function and contributes to poverty through impeding individual's ability

to lead productive lives. In addition, it is estimated that more than one third of under five deaths are attributable to under nutrition [2].

The World Health Organization (WHO) defines 'Nutrition' as the intake of food considered in relation to the body's dietary needs. Good nutrition means "maintaining a nutritional status that enables us to grow well and enjoy good health" [1]. Undernutrition is an important determinant of child health [2]. The effects of malnutrition of human performance, health and survival have been the subject of extensive research for several decades and studies show that malnutrition affects physical growth, morbidity, mortality, cognitive development, reproduction and physical work capacity [3].

Thoothukudi is a coastal town, and people living in this town are having the accessibility of consuming sea foods. But the people of Tsunami colony of this town are unable to afford for purchasing the sea foods and other food materials, because of the their poor economic condition. Hence the present study has been planned to carryout the nutritional status and health conditions of the people of Tsunami colony.

## MATERIAL AND METHODS

### Study Design

A  community based cross sectional – study was conducted to assess the prevalence of malnutrition and associated factors among the people of Tsunami colony of Thoothukudi town.

### Source and Study Population

The study was conducted from July 2017 to August 2017 in the colony. Source population were all the people living in the colony including children and the sampling was done randomly.

### Study Variable

Malnutrition indicated by stunting / obese and underweight.

### Malnourished

A child was labeled as malnourished if any of the nutritional assessment indices, weight for age or height for age is abnormal.

### Stunting

A child was defined stunted if the height for age index was found to be low.

### Underweight

It refers to a deficit and is defined as underweight if the child has low weight for age.

### Anthropometric assessment

Anthropometric assessment is concerned with the assessment of variation of physical dimensions and the gross composition of human body at different age levels and degree of nutrition. Anthropometric assessment was conducted to identify individuals with moderate to severe malnutrition. Nutritional status of all selected individuals was assessed by measuring body height (cm) and weight (kg) (WHO,2006).

### Height measurement

The height of an individual is influenced by genetic (hereditary) and environmental factors. Height (cm)of the subjects were taken with the help of a measuring tape by sticking to the wall. The subjects were made to stand erect, looking straight, buttocks, shoulders and head touching the wall, heads together and toes apart. The arms were kept hanging at side in natural manner and were kept parallel to flat surface while reading. Height was recorded in the nearest centimeter. Height of the respondents was compared with the standards of 50th percentile NCHS values [4] as shown in Annexure

### Weight measurement

Weight is usually regarded as the most meaningful method because weight deficit is directly proportional to nutritional deficiency. The personnel weighing machine of maximum capacity of 120kg and the minimum division of 0.5kg was used to weigh all the subjects and the scale was set to zero. The respondents were made to stand erect on the weighing scale, without foot wear, not leaning against or holding anything and the weight was recorded in kilogram. The scale was adjusted to zero after each measurement; weight of the respondent was compared with the 50th percentile standards of NCHS values [4] as shown in Annexure I.

### Degree of malnutrition: (Waterlow's classification)

Waterlow's classification are used to know the degree of malnutrition in school going children 7 – 9 years. Because it is based on weight and weight retardation. Formula are given below:

$$\text{Height / Age (\%)} = \frac{\text{Height of the child}}{\text{Height of the normal child}} \times 100$$

$$\text{Weight / Age (\%)} = \frac{\text{Weight of the child}}{\text{Weight of the normal child}} \times 100$$

**BMI**

The Body Mass Index of the subjects were calculated by using the following formula

$$BMI = \frac{\text{Weight (kg)}}{\text{Height (m}^2)}$$

**Environmental parameters**

The success story of man is centered on the control over his environment. In order to attain optimal function of the body and mind, man has to adapt and adjust to the environment. The physical, biological and physico-social environment all need to be harmoniously manipulated for optimum growth and development. "PPE spiral" that includes poverty, population growth and environmental stress has now been identified as the most important hurdle on the way to child development. Simultaneous attack on all these issues is supposed to improve the growth and development of a lot of children. Assessment of the environment can be achieved by rating the socio-economic status, education, occupation, income, sanitary conditions, housing conditions, etc. The environmental factors were assessed by evaluating socio-economic status and sanitary condition.

**RESULT**

160 households were included in the study of while there had to be a child aged 6-59months.The observed household ranged between 2 and 10 and the mean number of people in a household was 5 persons. The minimum and maximum number of people in a household was 2 and 10 respectively.

**Prevalence of malnutrition among children aged 6-59 months**

The overall prevalence of malnutrition of children among aged 6-59 months in the study area were 25% in males and 7% in females. 25% of males were obese (Fig 2) and 30% girls were of obese (Fig. 2). The highest prevalence of malnutrition children aged 6-59 months were seen in male (Table 2).

Compared with weight for age group, 77.8% of male and 22.2% of the female children were shown stunted, growth 41.4% of male children and 58.6% female children were underweight. Highest prevalence of malnutrition children aged 6-59 months were seen in males (Table 2) 38.1% of male and 61.9% of female children were underweight (Table 4). The children having the height <80-87.5cm showed underweight. 72.7% of males and 27.3% of female children were shown stunted growth as their heights fall between 8087.5(Table 4). 50% of male and 50% female children were noticed for severely impaired growth as their heights falls below 80cm (Table 4).

**Table: 1**
**Environmental characteristics of Tsunami colony**

| Characteristics | Frequency | Percentage |
|---|---|---|
| **Source of drinking water** | - | - |
| River | - | - |
| Unprotected | - | - |
| Protected | - | - |
| Public Tap | 160 | 100 |
| **Water used one day by liters** | - | - |
| <40 | - | - |
| 40 – 80 | 80 | 50 |
| >80 | 80 | 50 |
| **Treat water any means** | - | - |
| Yes | 15 | 9.4 |
| No | 145 | 90.6 |
| **Availability of latrine** | - | - |
| Yes | 160 | 100 |
| No | - | - |
| **Material used to wash hands** | - | - |
| After toilet | 15 | 9.4 |
| Using water only | 110 | 68.8 |
| Using soap times | 35 | 21.8 |
| Using soap always | - | - |
| **Method of dispersal** | - | - |
| **of HH wastes** | - | - |
| Open field dispersal | 80 | 50 |
| In a pit | - | - |
| Common pit | 5 | 3.1 |
| Composting | - | - |
| Burning | 75 | 46.9 |

**Table: 2**
**BMI**

|  | Male | Female |
|---|---|---|
| **Malnutrition** | 25(%) | 7(%) |
| **Normal** | 48(%) | 52(%) |
| **Obese** | 12(%) | 30(%) |

**Table: 3**
**Weight for age**

| Nutritional status | Male | Female |
|---|---|---|
| Normal > 95 | 51.1(%) | 48.9(%) |
| Stunting 87.5 – 95 | 77.8(%) | 22.2(%) |
| Underweight | 41.4(%) | 58.6(%) |

**Table: 4**
**Height for age**

| Nutritional status | Male | Female |
|---|---|---|
| Normal > 95 | 52.9(%) | 47.1(%) |
| Stunting 87.5 – 95 | 72.7(%) | 27.3(%) |
| Under weight 80 – 87.5 | 38.1(%) | 61.9(%) |
| Wasting <80 | 50(%) | 50(%) |

**Table: 5**
**Socio-Economic status scale**

|  | Percentage |
|---|---|
| Class I ( Upper ) | - |
| Class II ( Upper Middle) | 81.2 (%) |
| Class III ( Lower Middle ) | 17.6 (%) |
| Class IV ( Upper Lower ) | 1.2 (%) |
| Class V ( Lower ) | - |

**Table: 6**
**Sanitation**

| Sanitation | Percentage |
|---|---|
| Good | 11.9 (%) |
| Fair | 70.6 (%) |
| Poor | 17.5 (%) |

**Table : 7**
**Standard sanitary condition in the study area**

| Points | Behavior |
|---|---|
| 18-21 | Good |
| 13-17 | Fair |
| 7-12 | Poor |

**Annexure - I (Srilakshmi 2007 and Gibson 1990)**
**a. Height & Weight table**

| Nutrition status | (% of Height/Age) | (% of Weight/Age) |
|---|---|---|
| Normal | >95 | >90 |
| Stunting | 87.5-95 | 80-90 |
| Underweight | 80-87.5 | 70-80 |
| Wasting | <80 | <70 |

**b.Percentile classification of children**:

| Percentile | Grade |
|---|---|
| Above 95th | Obese |
| 85th to 95th | Over weight |
| 15th to 75th | Normal |
| 5th to 15th | Malnutrition |
| 5th & below | Severe malnutrition |

**c. Criteria for classifying into different grade nutrition status**:

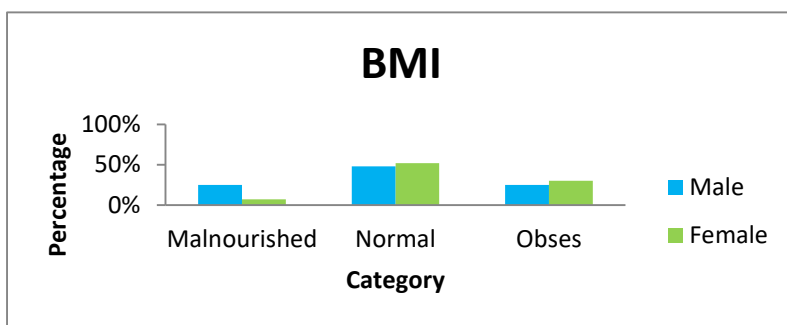| Parameter | Status | Indicator |
|---|---|---|
| Weight / age | Low weight for age | Under weight |
| Height / age | Low height for age | Stunting |
| BMI / age | High BMI for age | Obesity |
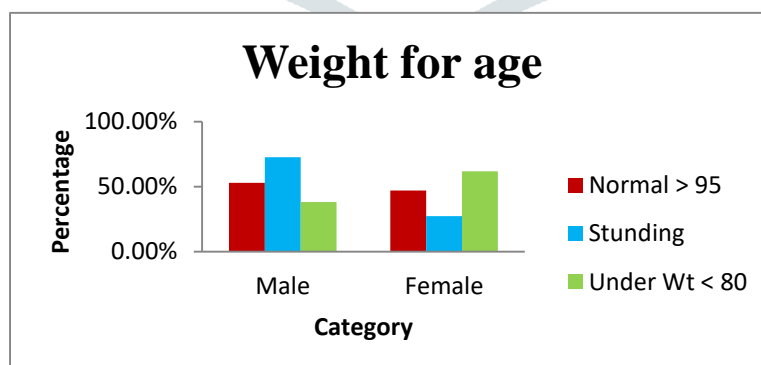


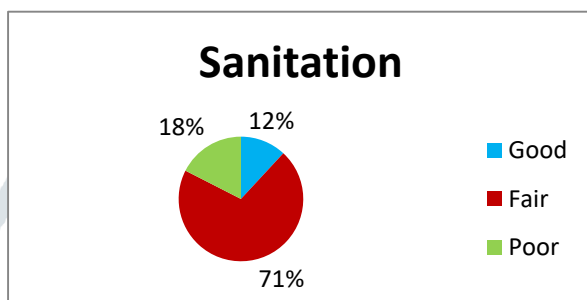Fig.1: Weight for age

**Fig.2 : BMI**
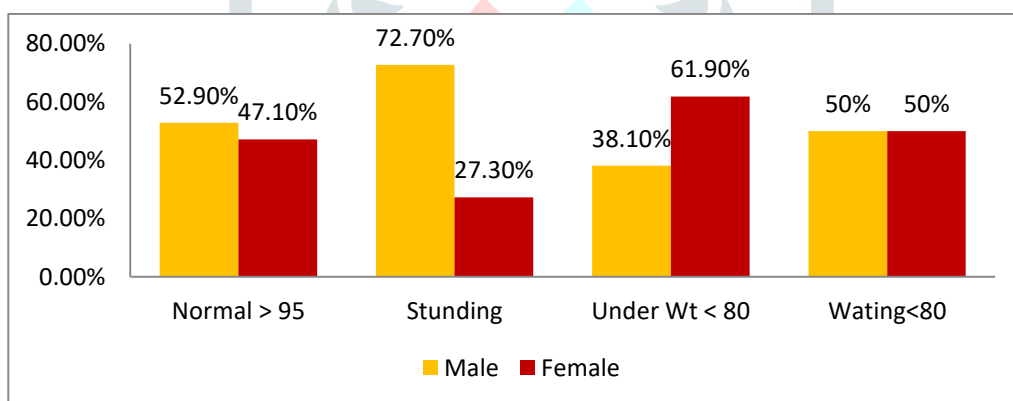


**Fig. 3 : Sanitation**



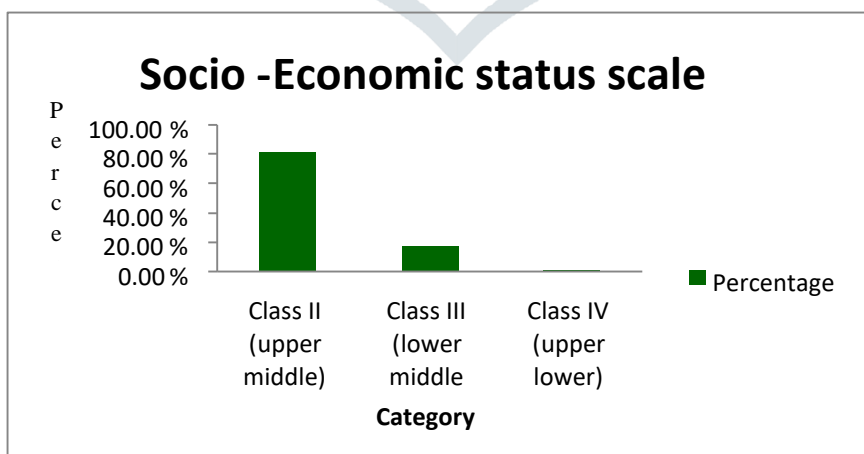**Fig.4 : Height for age**



**Fig. 5 : Socio-Economic status scale**

## DISCUSSION

"Malnutrition is an impediment to development". It  is a  serious public health problem. Children in preschool stage require more attention, as this is the period of rapid growth and development.  In the study area one in five households are headed by a women. Female headed households are more common in rural areas than in urban areas. In absolute numbers, an average 25 million children are wasted and 61 million are stunted. The state of child under nutrition in India is first and foremost a major threat to survival, growth and development and of great importance for India as a global player. The former Prime Minister Manmohan Singh has referred to under nutrition as a matter of national shame (The HINDU, online edition, 10th Dec2010).

The present study also the boys affected more (72.7%) than the girls (27.3%). The observations suggest that pre-school children need better nutrition to combat the problem of malnutrition. Further studies should be made to identify the factors responsible for it. At all India level, the prevalence of stunting was about 25% and the prevalence of stunting showed gradual decline (52% in 1992-1993) to (38.4% in 2005-2006). In the present study 72.7% of boys and 27.3% of girls showed malnutrition and 38.1% of boys and 61.9% of girls were shown stunted growth, 50% wasting was observed in both the sexes (Table 4).  The prevalence of malnutrition among children in the Tsunami colony of Thoothukudi town was 77.8% stunting and 41.4% underweight in male children and 22.2% and 58.6% stunting and underweight respectively in female children.

The result of the present study suggests that malnutrition remains a problem in the Tsunami colony of ThoothukudiTown.Even though the prevalence of underweight among male children is high in the Tsunami colony (41.4%) but lower than study conducted on food surplus region of Ethiopia in case of West Gojam zone, but the prevalence of underweight among the preschool children of Tsunami colony was higher (58.6%) than the West Gojam zone with 49.2% of children under five were affected by under weight [5].

Income is a mirror image of a household's resources. This study reveals that the prevalence of high percentage of malnutrition among the children is due to their inability to fulfill one of their basic needs the food

Lack of water (including safe drinking water) and inadequate hygiene and sanitation contribute in several ways to the incidence of disease and malnutrition. In the Tsunami colony 11.9% of households only had good sanitation, where as 10.6% of households had fair sanitation and 17.5% of the households are under poor sanitary conditions. This could be one of the reasons for the prevalence of higher percentage of malnutrition in the Tsunami colony.

According to UNICEF (2002) safe disposal of all households refuses help to prevent illness. For most households, refuse is usually left scattered indiscriminately around the houses in the Tsunami colony though 46.9% of the households are disposing their wastes by burning. But 50% of the people reported that they are disposing their wastes in open field.

The city council has not made any arrangement for refuse collection and disposal in the area. This would be the reason why there is no proper dumping of refuse in the study area.

The proportion of male children who were stunted were higher (72.7%) than that of female children (27.3%) (Table 4). The right medicine to give for malnutrition is good food.

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