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# Dietary diversity score a reliable indicator for normal nutritional status in preschool children

*1Jyothi.H & 2Dr.L.Prema

1Assistant Professor, Department of Home science,(food and Nutrition) ,Govt. College for women, Trivandrum, University of Kerala, Kerala (India)

2Former Professor and Head, (food and Nutrition),Kerala Agricultural University,Vellayani, Trivandrum (India)

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***Corresponding Author**
*Email: jyothiunni8[at]gmail.com*

**ABSTRACT**

Nutrition in preschool age plays an important role influencing growth and development. Periodic assessment in children is needed to determine their nutritional status and so as to identify problems in their food regimes .

**Objective** The present research paper aimed to study nutritional status of anaemic and non- anaemic preschool children .The present study again aimed to determine Dietary diversity score between meals consumed by preschool-aged children in the selected experimental and control groups and relate DDS as a reliable indicator for normal nutritional status.

**Materials and methods** The sample for the study comprised of 50 preschool children of 48-54 months, selected randomly from the rural areas of Malappuramdistrict, Kerala. 25 children evidenced of anaemia formed the experimental group and 25 children with normal haemoglobin levels were included as the control group. Haemoglobin levels were identified through finger prick method. The socioeconomic anthropometric standards were collected through prepared schedules. DDS was calculated from 24 hour recall for 3 days.

**Results** The results of the study indicated that there was statistical significance in between the control group and experimental group with respect to height ,weight, head circumference .chest circumference and Hb levels. Control group children found to have normal anthropometric standards, while the experimental group children were found to be in mild grades of malnutrition. A statistical significance was observed in between the groups with respect to DDS.

**Conclusion** The present study indicated that the nutritional status of preschool children should be given prime importance by their food diversity and proper awareness among the mothers can help to reduce the problem in a subtle way.

## 1. Introduction

Nutrition is very important for everyone, but for children it is directly linked to all aspects of their growth and development. It is a period of increased nutritional requirements because it is during this time that they gain up to 50% of their adult height and skeletal mass.

Shibili .R.M (2016) reported among the 400 preschool children studied in Kerala , 31% of the children were identified as underweight by IAP classification. Under nutrition is more prevalent amongst rural children, socially deprived societies and amongst children with illiterate mothers.

Predominant components in children's diet were cereals and pulses, followed by milk and milk products; the fruits and vegetables component was comparatively lower. .

Micro and macro nutrient deficiencies are public health concerns in most developing countries due to monotonous starchy and cereal-based diets, often with little or no animal products and few fruits and vegetables (Ruel, 2003).Preschool children with a haemoglobin concentration less than 11g/dL were considered anaemic.

A diverse diet is important in meeting the requirements for essential nutrients especially for those who are at risk of nutrient deficiencies especially preschool children.

Micronutrient intake can be increased by diversifying the diet to include fruits, vegetable and animal products. Dietary diversity has been shown to correlate with nutrient intakes and various anthropometric measurements in children (Ruel, 2003).

The present study was carried to identify the dietary diversity score and related nutritional status in preschool children.

## 2. Materials and methods

The sample for the study comprised of 50 preschool children of 48-54 months , selected randomly from the rural areas of Malappuram district, Kerala. 25 children evidenced of anaemia formed the experimental group and 25 children with normal haemoglobin levels were included as the control group. Haemoglobin levels were identified through finger prick method. The socioeconomic anthropometric standards were collected through prepared schedules. DDS were calculated from 24 hour recall for 3 days. Ethical clearance of the study were obtained by an institutional ethical committee *Genetika*Trivandrum.

Dietary diversity score was based on 24-h recall of mothers of child's consumption of 12 food groups within the past 24-h (for 3 days) using the FAO (2007) guidelines. Foods were categorised into 12 groups, (i) cereals, (ii) vegetables, (iii) fruits, (iv) meat, (v) egg, (vi) fish and other sea foods, (vii) legumes, nuts and seeds, (viii) milk and milk products, (ix) oil and fats, (x) sweets, (xi) spices, condiments and beverage, and (xii) tubers and roots. Commonly consumed foods in the area were incorporated into each food group.

The response categories were "Yes" if at least two food items in a group were consumed and this was scored one point. However, half point was awarded for food items less than two. In case where a food item was not consumed in a group, zero (0) point was given representing "No". Dietary diversity was obtained by summing the number of food and food items consumed in each group separately. The total score was calculated and this ranged from 0-12. Terciles of DDS were used to classify the children into low (≤4), medium (5-8) and high (9-12). These cut-offs were used due to lack of national and international guidelines on which to base cut-offs (FANTA, 2013). Mean scores were also calculated for each of the food groups.

### 3. Results and Discussion

Figure A,B.C,D and E represents the social variables studied. The family size greater than 5 constitutes 68% and the educational status of father and mother , the category up to tenth which has the maximum percentage. In the case of type of family majority 92 %was in the joint family pattern. The occupation of the parent shows coolie as the majority 94%.

**Fig 1 Distribution of families on the basis of social variables**

**Fig A – Family Size**

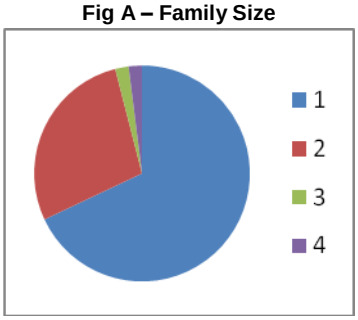


**Fig B - Educational Status of Father**

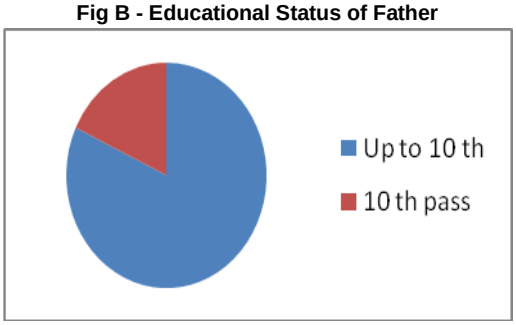


**Fig C - Educational Status of Mother**

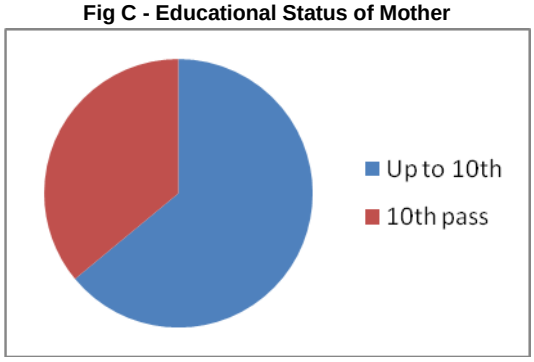


**Fig D –Type of Family**

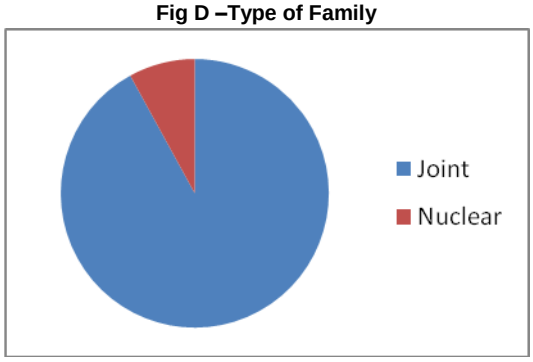


**Fig E –Occupation of Parent**

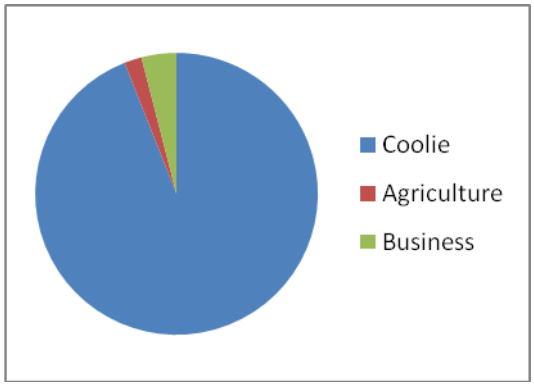


 

**Table 1 Educational status and monthly income of parent**

| Educational status of father | | Monthly income | Per-capita income |
|---|---|---|---|
| Up to 10th | Mean | 21512.195 | 3640.878 |
| | N | 41 | 41 |
| | Std. Deviation | 1247.4364 | 540.8909 |
| 10th pass | Mean | 21777.778 | 4112.778 |
| | N | 9 | 9 |
| | Std. Deviation | 1394.4334 | 675.3732 |
| Total | Mean | 21560.000 | 3725.820 |
| | N | 50 | 50 |
| | Std. Deviation | 1264.2655 | 588.9285 |
| F value | | 0.321 | 5.139 |
| P value | | 0.574 | 0.028 |
| Result | | Not Significant | Significant |

Table 1 indicates monthly income of the parents with educational status. No significant difference in monthly income with respect to educational status, but per-capita income is statically significant as it depends on the total family size. As the educational status of the parents and monthly income indirectly affects the nutritional status which in turn affects the cognitive performance, and the statistical insignificance indicates these variables does not make any difference in between the groups. So these groups are homogenous in nature with respect to educational status and monthly income.

**Table 2 Age of the groups**

| Group | Mean | N | Std. Deviation | Variable | F value | 2.646 |
|---|---|---|---|---|---|---|
| Control group | 52.000 | 25 | 2.0817 | Age | P value | 0.110 |
| Experiment group | 51.040 | 25 | 2.0913 | | Result | Not Sig. |
| Total | 51.520 | 50 | 2.1212 | | | |

Table 2 details the age of the study group then , the age of the control group had a mean of 52 months and experimental group 51 months. The statistical analysis through ANOVA showed that the age of the respondents in between the two groups were not significant.

**Table 3 Birth weight of the groups**

| Group | | Birth wt |
|---|---|---|
| Control group | Mean | 2.8720 |
| | N | 25 |
| | Std. Deviation | .16143 |
| Experimental group | Mean | 2.8480 |
| | N | 25 |
| | Std. Deviation | .15308 |
| Total | Mean | 2.8600 |
| | N | 50 |
| | Std. Deviation | .15617 |
| F value | 0.291 | |
| P value | 0.592 | |

Table 3 shows the birth weight of both the groups, and were found to have an average mean weight of 2.84 and 2.86 respectively.

**Table 4 Nutritional profile of the children**

| Group | | Height | Weight | BMI | Head .C | Chest.C | MUAC | Hb level |
|---|---|---|---|---|---|---|---|---|
| Control group | Mean | 102.120 | 14.956 | 14.3940 | 49.560 | 51.800 | 16.660 | 12.048 |
| | N | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| | Std. Deviation | 5.1585 | 1.3232 | 1.20176 | 1.4742 | 2.2730 | 7.1846 | .2257 |
| Experiment group | Mean | 95.480 | 12.172 | 13.4280 | 47.800 | 49.240 | 14.520 | 10.596 |
| | N | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| | Std. Deviation | 3.6069 | .5412 | 1.11450 | 1.2247 | 1.8321 | .4890 | .2071 |
| Total | Mean | 98.800 | 13.564 | 13.9110 | 48.680 | 50.520 | 15.590 | 11.322 |
| | N | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| | Std. Deviation | 5.5365 | 1.7258 | 1.24652 | 1.6092 | 2.4180 | 5.1544 | .7641 |
| F Value | | 27.820 | 94.805 | 8.684 | 21.082 | 19.223 | 2.208 | 561.715 |
| P Value | | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.144 | 0.00 |
| Result | | ** | ** | | ** | ** | | ** |
| Standard antropometric values | | 110-115 cm | 16-20kg | >14.3 | 50-52cm | 52-56cm | >13.5 | >11g/dl |

 

Table (4) details the anthropometric and Hb levels of the study group. The control group children were in the normal nutritional status as per IAP standards, while the experimental group children were found to be in the mild grades of malnutrition.

The Anthropometric and Hb level of the groups by ANOVA revealed that significant difference was there with respect to height weight head circumference ,chest circumference and Hb level in between the groups .Reports says that anaemia in children always associated with malnutrition. Shibili.R.M (2016)the study among 400 children under five years of age in Kerala reported 41% of the underweight children had anaemia,46.1% of the stunted children had anaemia and 37% of the children having wasting also had anaemia.

**Table 5 Dietary diversity score of groups**

| DDS | | | | | | |
|---|---|---|---|---|---|---|
| | N | Mean | Std. Deviation | Std. Error | Minimum | Maximum |
| Control group | 25 | 5.960 | .3512 | .0702 | 5.5 | 6.5 |
| Experimental group | 25 | 4.160 | .4500 | .0900 | 3.5 | 4.5 |
| Total | 50 | 5.060 | .9930 | .1404 | 3.5 | 6.5 |
| F value-248.593 P value .000 | | | | | | |

Table 5 dietary diversity score of the groups indicated that statistical significance was observed in between the related to DDS. The DDS of control group ranged between 5.5---6.5 which was in the medium range. In the case of experimental group DDS ranged between 3.5---4.5 which was in the low range.

**Table 6 Correlation between Hb and DDS**

| Correlations matrix for Hb and DDS | | Hb | DDS |
|---|---|---|---|
| Hb | Pearson Correlation | 1 | .964** |
| | Sig. (2-tailed) | | .000 |
| | N | 50 | 50 |
| DDS | Pearson Correlation | .964** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 50 | 50 |

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

Table 6 shows the correlation between Haemoglobin level and DDS. It was found that haemoglobin levels were 96.45% significantly correlated with DDS with P value 0.000.

## 4. Conclusion

The present paper also concluded that the nutritional status of preschool children should be given prime importance by their food diversity and adequacy and proper awareness among the mothers can help to reduce the problem in a subtle way.

## References


1. Shibily, R. M. , Sharanabasappa S. Dhanwadkar ,GeethuSukumarapilla . Prevalence of malnutrition and proportion of anaemia among the malnourished children aged 1-5 years in a rural tertiary care centre, South India. Int J ContempPediatr. 2016. 3(2)
2. 362-366
3. Ruel MT (2003). Is dietary diversity an indicator of food security or dietary quality? A review of measurement issues and research needs. Food Nutr Bull 24: 231–232.
4. FAO (2007). Guidelines for Measuring Household and Individual Dietary Diversity. FAO Nutrition and Consumer Protection Division, with Support from the EC/FAO Food Security Information for Action Programme and the Food and Nutrition Technical Assistance (FANTA) Project
5. FANTA (2013). Module 2. Nutrition Assessment and Classification. Nutritional Assessment, Counselling and Support (NACS): A user's guide. Food and Nutrition Technical Assistance III project, Washington, DC.


 