Assessment of growth and development of under five children as per new WHO child growth standards

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1. Introduction

The early period of life is associated with considerable opportunity for growth and development and is sensitive to harm. The Growth and development are the essential features of life of child that distinguish him or her from an adult.1 Adequate nutrition during early years of life is of paramount importance for growth, development and long-term health throughout the adulthood.2 The process of growth starts from the time of conception and continue
till the child grows into mature adult. Growth denotes a net increase in size or mass of tissue and development specifies maturation of function. To assess the growth and development various Growth Charts are used. Growth monitoring consist of serial assessment of both weight and height measurement over time so that the growth velocity can be assessed. Growth Charts are a graphical presentation of body measurement that aid in the assessment of body size, shape and in the observation of trends in growth performance. They are used in the assessment and monitoring of the individual children. Poor nutrition during this critical period contributes to significant morbidity and mortality, long term consequences include reduced work capacity, impaired intellectual performance and increased risk of chronic diseases. In India common illness occur in children less than 3 years of age include: fever (27%), acute respiratory infections (17%), diarrhoea (13%) and malnutrition (43%).4 Malnutrition is responsible, directly or indirectly for about one third of deaths among children under five,4 so time to time assessment and monitoring is essential.

All major national surveys carried out in India by the National Nutrition Monitoring Bureau, the National Family Health Survey5–8 and the District Level Household Survey have used IAP standards to estimate the prevalence of under nutrition. On top of it through review literature it has been observed that the most of the studies related to growth and development /nutrition of children were conducted as per standards other than 21st century WHO growth standards. Very few studies have been conducted as per WHO New Global Child growth standards (MGRS multi growth reference study).2 In relation to Indian setting most of the studies have focused on growth and development of children as per IAP standards. Out of these studies very few have focused on under five, few of them were on premature infants, some were on children of age birth upto 2 years of age or from 5-12/18 years of age.8–12 In a study conducted at Chandigarh, Punjab India the prevalence of underweight was calculated using both IAP and new WHO growth standards. The prevalence of underweight in the first 6 months of life was nearly 1.6 times higher when calculated with WHO Child Growth Standards compared with IAP growth curves. For children of all ages combined, the prevalence of underweight was 1.4 times higher when IAP standards rather than the new WHO standards were used, with the absolute difference being 14.5% (P < 0.001).

Overall estimates for severe malnutrition were 3.8 times higher using the new WHO standards rather than IAP standards (P < 0.001). Furthermore, IAP standards led to an overestimated prevalence of undernutrition among girls in particular (by 21.2% compared with WHO standards).13 So the present study has been taken up keeping in mind the superiority of the WHO growth standards and paucity of information available from the present setting.

2. Aim

To assess the growth and development of under five children as per new WHO growth standards in selected community of Haryana.

3. Materials and Methods

The study design was descriptive in nature and was conducted on confidently selected rural and urban community of Haryana i.e. village Tandwali and Pooja vihar, Ambala. The study focuses upon all under five children.

In the sample under five children who met the following inclusion criteria were included parents /Guardians able to understand Hindi/English/Punjabi and are willing to participate and also allow child to participate.

A sample of 140 children was taken on total enumeration basis. Eighty five (85) were from urban and 55 were from rural community. The tool consists of Screening sheet, Growth and Development Performa with new WHO growth charts and 5-6 checklists to ensure accurate measurements. Inter-observer reliability of all checklists was found to be greater than 0.80. The main tool that is Growth and Development Assessment Performa consisted of three parts demographic variables of child, demographic profile of parents and anthropometric assessment of the child. In Anthropometric assessment of the child along with measurement, z-score interpretation (weight-for-age, length/height-for-age, and weight for height /length) was also included. Tool try out was done and reliability was found to be 0.80. Pilot study was conducted and the study was found to be feasible. Data was collected by door to door survey. After filling the screening sheet, anthropometric assessment was done and growth charts were plotted and interpreted. Recording was done in Growth and Development assessment Performa. After data collection, data was coded, tabulated and analyzed with SPSS-17. Data was presented with help of tables, frequency and percentages.

4. Results

4.1. Socio-Demographic variables of children.

Majority of the children 113 (80.7%) were in age group 1-5 years, 23 (16.3%) were of 2months -1year of age, and only 4 (2.9%) were infants. Gender of 83 (59.3%) was male. Out of total 132 (94.3%) were born in gestation of 34-40 weeks and remaining 8 (5.7%) were born in the gestation of 28-34week. All (100%) children had single birth, 124 (88.6%) had birth weight in range of 2-3 kg and equal number 8(5.7%) had birth weight in range of 1-2 kg and 3-4 kg respectively, 114 (81.4%) were vegetarian; out of all 73 (52.1%) children were breastfed within 1 hour of birth.
4.2. Socio-Demographic variables of Family.

Majority of the fathers 75 (53.6%) were in age group 25-30 years, 69 (49.3%) mothers were in age group 18-25 years, 49 (35.0%) fathers were educated up to 8th standard, 53 (37.9%) of mothers were educated up to 8th, 138 (98.6%) mothers were housewives, 84 (60.0%) families were nuclear, 98 (70%) children had siblings ranging between 1-2, eighty-four (60.0%) families had 0-5 family members, 53 (37.9%) families had family income between 5000-10000Rs.

4.3. Anthropometric Measurements of child and Z-score interpretations.

4.3.1. Weight for age

Table 1: Frequency and Percentage Distribution of Z-Score related to weight for age of Child. N=140

<table>
<thead>
<tr>
<th>Weight for age (Z-score)</th>
<th>Interpretation</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 1 to ≤ 2</td>
<td>Normal</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>≤ 1 to &gt;-1</td>
<td>Normal</td>
<td>72</td>
<td>51.4</td>
</tr>
<tr>
<td>≤-1 to &gt;2</td>
<td>Normal</td>
<td>12</td>
<td>8.6</td>
</tr>
<tr>
<td>≤-2 to &gt; -3</td>
<td>Underweight</td>
<td>32</td>
<td>22.9</td>
</tr>
<tr>
<td>&lt; -3</td>
<td>Severely under weight</td>
<td>22</td>
<td>15.7</td>
</tr>
</tbody>
</table>

As per weight for age charts 86 (61.4%) children were normal, 32 (22.9%) were underweight, 24 (17.1%) were severely underweight.

4.3.2. Length for age

Table 2: Frequency and Percentage Distribution of Z-Score related to length/height for age of child N=140

<table>
<thead>
<tr>
<th>Length /height for Age (Z Score)</th>
<th>Interpretation</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 2</td>
<td>Height is above normal</td>
<td>5</td>
<td>3.6</td>
</tr>
<tr>
<td>≥ 1 to ≥ 2</td>
<td>Normal</td>
<td>8</td>
<td>5.7</td>
</tr>
<tr>
<td>≥ 1 to &gt; -1</td>
<td>Normal</td>
<td>62</td>
<td>44.3</td>
</tr>
<tr>
<td>≤ -1 to &gt; -2</td>
<td>Normal</td>
<td>16</td>
<td>11.4</td>
</tr>
<tr>
<td>≤ -2 to &gt; -3</td>
<td>Stunted</td>
<td>26</td>
<td>18.6</td>
</tr>
<tr>
<td>&lt; -3</td>
<td>Severely Stunted</td>
<td>23</td>
<td>16.4</td>
</tr>
</tbody>
</table>

As per Length for Age charts 86 (61.4%) children had normal length/height, 26 (18.6%) were stunted, 23 (16.4%) of children were severely stunted.

4.3.3. Weight for length/height

As per weight for height/weight out of all the children 42 (54.2% 9.9%) were normal, 32 (22.9%) were wasted, 27 (19.3%) were severely wasted. Only 3 (2.2%) were overweight and only 2 (1.4%) were obese.

5. Discussion

Various studies have been conducted to assess the growth and development of the under five children with the use of different growth standards (WHO growth standards, IAP growth standards and NCHs growth references) in Indian as well as in foreign setting. In most of the studies it was revealed that the percentage of stunted children was high followed by underweight and wasting using any of the standards. Similarly one of the studies which was conducted at Vietnam based on the reference data from the National Centre for Health Statics (NCHS), it was revealed that out of 650 children, 269 (44.3%) were stunted, 193 (31.8%) children were underweight and 72 (11.9%) were wasted. In another study conducted at Allahabad the nutritional assessment was done by the WHO criterion using summary indices of nutritional status weight-for-age, height-for-age and weight for height. It was reported that among all under five children 51.6% were stunted, 36.4% were underweight, and 10.6% were wasted. Whereas, the results of the present study revealed that out of 140 under five children 26 (18.6%) were stunted, and equal number 32 (22.9%) were underweight and wasted respectively which represent that underweight and wasting is approximately double the number of children stunted. This is in contrast with the trend of study conducted at Puruliya where stunting was 17.6%, and underweight was 33.7% and was nearly more than the double of stunting. In relation to severe malnutrition in present study 23 (16.4%) children were severely stunted, 22 (15.7%) were severely underweight, and 27 (19.3%) were severely wasted. This is evident that approximately equal numbers of children were severely stunted and severely underweight. This is in similar to one of the study form west Bengal in which it was observed that out of 2016 children, aged 3.0-5.9 year approximately equal percent of children were stunted and underweight whereas, the percentages were more than the double in comparision to present study that is 48.20%, and 48.30% respectively. Whereas in relation to severe underweight and severe wasting the percentage of children in the present study was higher than any other. This can be because of some acute process of malnutrition.
which might have taken place among growing children of the study population and underweight status being a composite index of chronic or acute malnutrition. Secondly as Compared to the old NCHS/WHO growth reference, the new WHO growth standards estimate that a higher proportion of children are stunted and wasted.

6. Conclusion

The study has revealed that 23 (16.4%) of children were severely stunted, 22 (15.7%) were severely underweight and 27 (19.3%) were severely wasted, which indicates that children had both acute and chronic malnutrition. These findings of study are eye opening and are suggestive of a need of assessment of malnutrition on large scale, In addition there is need to implement education programme to educate mother on and prevention and management of malnutrition among children.

7. Source of Funding

None.

8. Conflict of Interest

None.

References

5. WHO. Promoting proper feeding for infants and young children; 2003.

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