ORIGINAL ARTICLE

Nutritional Status and Its Related Factors among 6-24 Month-Old Children Referring to Health Care Centers in Arsanjan City, Southern Iran

Shiva Faghih[1]*, Najmeh Ebrahimi[2]

1. Department of Community Nutrition, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran
2. Nutritionist, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

ARTICLE INFO

Corresponding author:
Shiva Faghih,
Department of Community Nutrition,
School of Nutrition and Food Sciences,
Shiraz University of Medical Sciences,
Shiraz, Iran
Email: sh_faghih@sums.ac.ir

ABSTRACT

Background: Considering that children are major part of most populations and also considering the fact that childhood nutrition affects the health status in adulthood, we aimed to assess the nutritional status and its related factors among 6-24-month-old children referring to health care centers in Arsanjan city, southern Iran, in 2011.
Methods: This cross-sectional study was done on 310 children aged 6-24 months. Weight and height were measured and data regarding demographic status, type of feeding, and birth order, were gathered by face to face interview with mothers of the children. Exact age of the children was recorded according to their birth certificate. Z-scores of weight and height were calculated using Epi-info software. SPSS version 16 was used for data analysis.
Results: 27.2% of the studied children were mildly underweight, 2-6% were moderately underweight, and 0.3% were severely underweight. Also 15.6%, 1.6%, and 0.3% had mild, moderate, and severe stunting, respectively. According to weight for age index 7.4% were mildly overweight and 1.6% were moderately overweight. The prevalence of underweight was significantly more among 6-month-old children compared with the older children (P=0.019). There were no correlations between underweight and stunting and parents' education or breast feeding.
Conclusion: Our results indicated that although the prevalence of malnutrition is less than previous decade, it is still substantial. On the other hand it seems that the prevalence of overweight among children younger than 2 years is increasing. As childhood obesity is a risk factor for adulthood obesity and its related diseases such as diabetes and cardiovascular diseases, prevention of obesity among children is of importance.

Introduction

Children as a large part of population in developing countries, are susceptible to various health problems (1). Some studies indicate that malnutrition during the first years of life causes physical retardation, frequent infectious diseases, (2, 3) and reducing physical activity (2, 4).

Results of ANIS study in 1998 showed that protein energy malnutrition was one of the nutritional problems among children younger than 5 year in Iran. In this study 10.9% of children younger than 5 year were moderately

and severely underweight and 15.4% were stunted (5). According to a study in 2004 by Sheikholeslami and colleagues, the prevalence of moderate and severe underweight and stunting in children younger than 5 year have decreased to 5.2% and 4.7%, respectively (2).

Despite being in nutrition transit and considering the importance of obesity related studies among children in this period, in most of national studies the prevalence of obesity has not been reported (6). Obesity in childhood usually leads to obesity in adulthood (7). Moreover childhood obesity is correlated with the increased risk of type 2 diabetes, cardiovascular diseases, and metabolic syndrome in adulthood (8, 9).

Having considered the above mentioned facts, we aimed to assess the nutritional status and its related factors among 6-24-month-old children referring to health care centers in Arsanjan city, southern Iran, in 2011.

Materials and Methods

310 children aged 6 to 24 months participated in this cross-sectional study. Weight and height of the participants were measured by an expert staff and data regarding demographic status, type of feeding, and birth order, were gathered by face to face interview with mothers of the children. Before doing the measurements, written consents were taken from all mothers. Exact age of the children was recorded according to their birth certificate.

Weight was measured with the least clothing and was rounded to the nearest 100 gram. Height was measured in supine position and was rounded to the nearest 0.5 centimeter using children specific studio meter. Z-scores of weight for age (WAZ), height for age (HAZ), and weight for height (WHZ) were calculated using Epi-info software. WHZ was considered as the present nutritional status index, HAZ as past

nutritional status index, and WAZ as present and past nutritional status index (10). Mild, moderate, and severe underweight, stunting, and wasting were defined as -1 to -1.99, -2 to -2.99, and less than -3 standard deviations of 50th percentile of standard respectively (11). Mild, moderate, and severe overweight were considered as 1-1.99, 2-2.99, and more than 3 standard deviations of 50th percentile of WAZ and WHZ. SPSS software version 16 was used to analyze the data. Descriptive statistics were used to estimate prevalence of obesity/malnutrition. We assessed the relationship of nutritional status and potential factors by Kruskal Wallis test. Which statistical tests were used and to compare what?

Please write about ethics committee approval and obtaining informed consent from the parents of the children

Results

Of the 310 children participated in the study 159 (51.3%) were girls and 151 (48.7%) were boys. Mean±standard deviation of the participants' age was 14.18±5.87 months. 56 (18.6%) children were 6 months old, 84 (27.1%) were 7 to 12 months old, and 170 (54.8%) were 13 to 24 months old. Table 1 shows the frequency of nutritional status indices among the studied children.

As it is shown in table 1 the prevalences of mild, moderate, and severe underweight were 27.2%, 2.6%, and 0.3%, respectively. 2o.1% of the participants had mild wasting, and 3.6% had moderate wasting. Mild, moderate, and severe stunting was seen in 15.6%, 1.6%, and 0.3% of the children, respectively. According to weight for age index 7.4% had mild overweight and 1.6% had moderate overweight. Based on weight for height index 9.4% and 1% were mildly and moderately overweight.

According to tables 2 and 3, the prevalence of underweight and wasting was significantly

Table 1: Frequency of nutritional status indices among the studied children						
Index	Weight for age		Weight for height		Height for age	
	Number	Percent	Number	Percent	Number	Percent
Z≤-3	1	0.3	0	0	1	0.3
-2.99≤Z≤-2	8	2.6	11	3.6	4	1.6
-1.99≤Z≤-1	84	27.2	62	20.1	48	15.6
-0.99≤Z≤1	188	60.8	204	66	223	72.4
1≤Z≤1.99	23	7.4	29	9.4	23	7.5
2≤Z≤2.99	5	1.6	3	1	8	2.6
3≤Z	0	0	0	0	0	0
Total	309	100	309	100	308	100

Table 2: Frequency of weight for age among the studied children by age						
Age(month)	6		7-12		13-24	
Index	Number	Percent	Number	Percent	Number	Percent
Z≤-2	0	0	2	2.4	7	4.1
-1.99≤Z≤-1	7	12.5	29	34.9	48	28.2
-0.99≤Z<1	44	78.6	47	56.6	97	57.1
1≤Z≤1.99	5	8.9	4	4.8	14	8.2
2≤Z	0	0	1	1.2	4	2.4
Total	56	100	83	100	170	100

Table 3: Frequency of weight for height among the studied children by age						
Age(month)	6		7-12		13-24	
Index	Number	Percent	Number	Percent	Number	Percent
Z≤-2	1	1.8	3	3.6	7	4.1
-1.99≤Z≤-1	5	8.9	18	21.7	39	22.9
-0.99≤Z<1	42	75	56	67.5	106	62.4
1≤Z≤1.99	8	14.3	5	6	16	9.4
2≤Z	0	0	1	1.2	2	1.2
Total	56	100	83	100	170	100

different among different age groups (P=0.019 and P=0.049 respectively). It was less in 6-month-old children compared with older children.

There was no significant difference between the nutritional status of girls and boys. Also no significant correlation was seen between underweight, wasting, and stunting and parents' education or breast feeding.

Discussion

Results of this study indicated that the prevalence of mild short duration malnutrition was 27% and the prevalence of moderate plus severe short duration malnutrition was 3%. Also the prevalence of mild long duration malnutrition and moderate plus severe long duration malnutrition were 15% and 2%, respectively. On the other hand mild and moderate overweight were seen in 9% and 1% of the children.

In a similar study by Ramazani and colleagues the prevalence of underweight, wasting, and stunting among children younger than 24 months in southern Khorasan in 2006 was 10.6%, 11.6%, and 5.3%, respectively (11). Also in 2004, Iranian Ministry of Health and Medical Education reported that the prevalences of moderate to severe underweight, stunting, and wasting among under 24-month-old children were 7.7%, 15.5%, and 4.3%, respectively (12). It seems that compared with the studies done during the last decade, the prevalence of malnutrition has decreased in our study, which could be resulted

from higher education of mothers, more nutrition education via public media, and better services provided by health care centers.

In our study, in addition to malnutrition there was 10% mild and moderate overweight. In accordance with our study, Esfarjani and colleagues in 2005 reported 11% underweight, 6% stunting, and 5% overweight among children younger than 5 years who were under coverage of the Imam Khomeini Relief Foundation of Tehran (13). Most of the studies in Iran just reported the prevalence of malnutrition but our results indicated that the prevalence of overweight and obesity among children is also important.

Comparison of malnutrition among different age groups showed that the prevalence of malnutrition increased as children getting older. In agreement with our findings Eftekhari, Montazeri and their co-workers showed that the prevalence of underweight was less among under 6-month-old compared with older children (14, 15). It seems that decreasing the frequency of breast feeding and receiving foods with low nutritive value to the children might be the main reason for this event.

We did not found any significant correlation between the prevalence of malnutrition and breast feeding or bottle feeding. Regarding the fact that among the participants just 1.6% had bottle feeding, it is logical not to find any significant correlation. In accordance with our finding, Mohammadpour and co-workers did

not find any correlation between malnutrition and breast feeding (16).

Although some studies reported a correlation between mothers' education and malnutrition (14, 17), we did not find such correlation in our study. Given the increasing trend of educational programs about nutrition via public media and better services of health care centers related to children nutrition for mothers, it seems that mothers' education is not a suitable index for estimating their nutritional knowledge.

In conclusion our results indicated that although the prevalence of malnutrition is less than previous decade, it is still substantial. On the other hand it seems that the prevalence of overweight among children younger than 2 years is increasing. As childhood obesity is a risk factor for adulthood obesity and its related diseases such as diabetes and cardiovascular diseases, prevention of obesity among children is of importance.

Acknowledgement

Conflict of Interest

None declared.

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