Original article

Prevalence of Malnutrition in Children 7-12 Years Old in Kerman, 2013

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Abstract

Introduction: Malnutrition remains among the most serious children health problems and the main cause of children mortality in the World Health Organization (WHO) Eastern Mediterranean Region. Nearly one-third of children in the region are either underweight or stunted, and more than 30% of the population suffers from micronutrient deficiencies. The aim of this study is to determine the prevalence of malnutrition among school children in Kerman.

Materials and Methods: This is a cross–sectional study. A number of 1,056 students of Kerman, in the age range of 7 to12 years were selected by multistage sampling. Children weight for age (W / A), height for age (H / A) and weight for height (W / H) indicators was calculated and were compared with NCHS standard index. Students' height and weight were measured with standard tools. Epi-info and Stata 11 software were used for analysis. Descriptive and chi 2 tests were used to provide a comparison according to (in) gender (sex).

Results: Prevalence of Malnutrition based on weight-for-age, height-for-age and weight-for-height respectively is 6.06, 5.58 and 75.9 percent and the average prevalence of malnutrition with above indicators respectively is 24.43, 26.04 and 24.90 percent. Comparison of weight-for-age and weight-for-height indices in children showed higher prevalence of malnutrition in girls compared to boys (P-value<0.05).

Conclusion: According to our results, prevalence of malnutrition among school children was high in Kerman and the causing factors must be identified and the necessary planning should be performed to eliminate them.

Keywords: Malnutrition, Children, Kerman

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Introduction

Malnutrition is the most serious children health problem and the main cause of children mortality in the World Health Organization (WHO) Eastern Mediterranean Region. Nearly one-third of children in the region are either underweight or stunted, and more than 30% of the population suffers from micronutrient deficiencies. High-and middle-income countries are experiencing both kinds of malnutrition i.e. micronutrient deficiencies and overweight people, which enhance diseases burden in Eastern Mediterranean Region [1]. A proper diet and nutrition program is required to protect health and fitness in children. Neglecting this important issue would cause major problems in physical and mental health status and also is a threat for growth and development of children [2]. Naturally, there is an instinctive ability for growth in children that can be affected by various factors if it is not noticed and sometimes prevents growth and development of children [3]. Chronic malnutrition in early adolescence is responsible for growth retardation in many parts of the world. Iron deficiency and its anemia is also one of the main problems of teenage girls around the world. Improving nutrition of this group before pregnancy can help reducing infant and maternal mortality [4]. In this age, due to physical and mental changes and also increase of nutrition requirements for rapid growth and due to changes in nutrition diet, the balance between energy and food intake is collided. Thus, this is the most important nutritional vulnerability period [5]

Malnutrition, as one of the most important causes of growth retardation with infection, is responsible for 54-46 percentages of children mortality in developing countries [6]. Also, in these countries, high prevalence of malnutrition and its relation to children mortality rate and somatic growth deficiency is the most fundamental problem in the health sector [7]. United Nations International Children's Emergency Fund (UNICEF) has announced in its report on malnutrition in Iran that 11% of Iranian children suffer from moderate and severe underweight, 5% suffer from moderate and severe thinness and 15% suffer from moderate and severe stunting [8]. Over 16% of diseases in world are due to malnutrition; this figure goes up to 33% in deprived areas [9]. Recent studies show that malnutrition can significantly affect children's learning in educational environment as well as their future success in life [10].

The quality of nutrition status is known as one of the best indicators in health gamut and static anthropometric measurement is also a method with high reliability and low economic costs, by which health situation of individuals or communities can be assessed [11]. Weight and height are two important anthropometric indicators used in all age groups. World Health Organization (WHO) in 1986 proposes children height for age (stunting), weight for age (underweighting) and weight for height (thinness) indicators to diagnose malnutrition based on NCHS standards.

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Since children in primary school are one of the most vulnerable groups and their health provides the context to increase their learning, and according to the importance of identifying malnutrition aspects in all age groups specially children, this study was accomplished with aim of malnutrition prevalence survey among 7-12 years olds in Kerman in 2013.

Materials and Methods

This is a cross–sectional study accomplished in Kerman in winter 2013. According to malnutrition prevalence (81.9%) in previous studies, confidence level of 95%, acceptable error of 0.03 and also design effect of 2 and 6 educational grade, the sample mass was obtained 1008, and finally, 1056 students participated in the study. The samples were selected from students in Kerman by multistage sampling.

At first 3 girl and 3 boy schools are selected by random sampling of 2 education districts in Kerman. Then in each school, 15 students were selected from each grade by random sampling. Before beginning the study the required permission was assumed from Kerman Education Office and the consent form was given to students the day before inquiry and measuring that was delivered to researchers in day of measurement.

The participation rate was 100%. The student's weight was measured by appropriate and precise scale with light cloths and no shoes. The student's height was also measured by taping meter mounted on the wall, while students had no shoes, feet stuck together and hip, shoulders and back of the head were in contact with the wall. The background variables were simultaneously recorded. All the measurements were accomplished by the project executers and trained experts.

The weight for age (weight/age), the height for age (height/age) and the weight for height (weight/height) indicators were used to evaluate malnutrition status and compared with NCHS (National center for Health statistics) standards. The weight for age indicator assesses the prevalence of underweight represented past and present malnutrition and the height for age indicator also assesses the prevalence of stunting represented past malnutrition and the weight for height is for assessing the prevalence of thinness [13].

Data analysis was performed by Epi-info 2000 and Stata 11 software and Descriptive and Chi-Squire tests.

Results

This study includes 1056 students; 530 boys (19.50%) and 526 girls (81.49%). Malnutrition status is shown in Table1 according to the weight for age, the height for age and the weight for height indicators. In this table, malnutrition indicators are enumerated to three categories: severe, moderate and normal.

Table 2 demonstrates that there is a statistically significant difference in malnutrition in weight for age (underweight) and weight for height (thinness) indicators among the children ($P<0.001$). However, the prevalence of malnutrition for height for age

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indicators were high both in boys and girls but there is no statistically significant difference between two groups according to height for age indicator (thinness).

Table 1: The frequency of types of malnutrition in children 7 to 12 years in the city of Kerman, 2013

Indicator	Weight for age		Height for age		Weight for Height	
Severity	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Sever	64	6.06	59	5.59	103	9.75
Medium	258	24.43	275	26.04	263	24.91
Normal	734	69.51	722	68.37	690	65.34
Total	1056	100	1056	100	1056	100

Table 2: Comparison of the prevalence of malnutrition in children 7 to 12-years in the city of Kerman, by sex 2013

	Gender	Normal	Medium	Sever	P-value
Weight for age	Male	411(77.55)	96(18.11)	23(4.34)	<0/001
	Female	323(61.41)	162(30.80)	41(7.79)	
Height for age	Male	369(69.62)	133(25.09)	28(5.28)	0.675
	Female	353(67.11)	142(27.00)	31(5.89)	
Weight for height	Male	375(70.75)	118(22.26	37(6.98)	<0/001
	Female	313(59.51)	146(27.76)	67(12.74)	

Discussion

In this study, the prevalence of malnutrition in primary school children (7-12 years old) was estimated by using anthropometric indicators and compared with NCHS standards. Based on the results, the prevalence of malnutrition was nearly high according to the weight for age, the height for age and the weight for height indicators for boys and girls in primary schools of Kerman, however, compared to the study by Alavi Naien et al on primary school girls of Kerman in 2008, a significant reduction was shown in all three indicators [4].

The prevalence of severe and moderate malnutrition, according to the weight for age indicator, were respectfully 6.06% and 43.42% , which were lower than the study of Dehghan et al. in Larestan, Ghorbani et al. in Zanjan and Aghamolaie et al. in Bandar abbas [8,14,15] and were nearly equal to the study of Delourian zade et al. in Shahroud and Darvishi et al. in Kordestan [9 , 11]. However, compared to the study of Alavi Naieni et al., a significant reduction is observed [4].

The prevalence of severe malnutrition in girls, according to height for age indicator, was 5.59% and significantly higher than boys. Also, the prevalence of malnutrition in girls reduces to less than half of the same factor in the study by Alavi Naieni et al [4].

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In a study conducted in Kordestan, the prevalence of malnutrition was 6.5, which is almost equal to our study and also the prevalence in girls was higher than boys [11]. The prevalence of malnutrition in studies performed in Shahroud, Zanjan, Bandar abbas and Larestan was higher than the current study [8, 9, 14, and 15]. The prevalence of malnutrition according to the height for age indicator in female students was higher in studies performed in Larestan and Kordestan [8 , 11]. It should be noted that studies in other parts of country were conducted in previous years and the prevalence of malnutrition might have reduced in other parts, too.

The prevalence of severe malnutrition according to weight for height indicator was 9.75% that was almost equal to the study in Larestan [8] and less than similar studies in Kordestan and Bandar abas[11 , 15] and also higher than similar studies in Zanjan and Shahroud [9,14].

The geographical factors, nutritional pattern of ethnic and different cities, different socioeconomic level and genetic factors can justify the prevalence of malnutrition differences in various geographical regions.

Reduction in prevalence of malnutrition, according to three indicators (weight for age, height for age and weight for height), is probably due to proper nutritional training to mothers and children and intervention programs such as food security plan and distribution of subsidy milk and free nutrition in schools. Also, improvement of economic and social situation of households and decrease in household size can be effective. It should be considered that the main part of malnutrition is not due to slight food intake but is a result of poor nutrition pattern. The proper nutrition training can be useful and target groups are mothers and children.

Conclusion

It can be concluded that the prevalence of malnutrition is nearly high and equal to other parts of country, but less than 2013. Thus, more efforts should be accomplished to reduce the prevalence of malnutrition in the forth-coming years.

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