Original Article

Nutritional Status of Working Children as a Neglected Group in Kermanshah

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Abstract

Introduction: Working at an early age can have adverse consequences on health. Working children due to their occupational hazards are at risk of communicable and non-communicable diseases such as malnutrition, anemia and growth retardation. This study aimed to determine the nutritional status and prevalence of anemia in working and non-working children.

Material and Methods: This case-control study was carried out as cross-sectional, on 90 working and 90 non-working 8-18 year-old boys in Kermanshah. The data gathering tools were demographic and food frequency questionnaires (FFQ). Anthropometric parameters were measured using standard tools. 5 ml blood for blood biomarkers test was collected from the participants.

Results: Average height and weight of the working children were respectively 3.7 cm and 5.7 kg less than of those of the non-working children (P = 0.02). Prevalence of iron deficiency in working children was more than double in non-working children (28% vs 11.3%, P = 0.01). Hemoglobin concentration in working children was significantly less than that in non-working children (p=0.05). Except for bread and cereals, the working children's consumption of all food groups was significantly less than that of non-working children (P <0.001).

Conclusion: Working children are at the risk of developing anemia and malnutrition so they need emergency nutritional supports.

Keywords: Working children, nutritional status, anemia & anthropometry.

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Introduction

Child labour refers to the employment of children in any work that deprives them of their childhood, interferes with their ability to attend regular school, and is mentally, physically, socially or morally dangerous and harmful to them [1]. Child labor is an important global issue associated with poverty, inadequate educational opportunities, gender inequality, and a range of health risks [2]. International Labour Organization (ILO) estimates that there are approximately 250 million child labourers worldwide, and 96% of them reside in developing countries in Africa, Asia, and Latin America. Child laborers are working under circumstances that have denied them a childhood and in conditions that jeopardize their health and even their lives [3].

In Pakistan, the number of working children is estimated 11-12 million and at least half of them are less than 10 years old [4]. Child labour in industrialized and developing countries is related to economic poverty, inadequate educational opportunities and lack of law enforcement and standards [5].

Most working children are from low-income families with lower levels of education [6]. Working at an early age has adverse effects on social and physical parameters [4]. Studies show that many working children suffer from malnutrition and lack of growth [7.8]. Although child labour is recognized as a global health problem, research on its impact on children's health has been limited and sometimes inconsistent [2]. The design of effective policy to help child labour requires the accumulation of more detailed evidences of the relationship between work activity and health consequences in childhood.

In spite of the fact that child labour is easily visible in most areas in Iran, there are no exact figures for their number [9]. Anemia and anthropometric measurements are two important health indicators to determine the health conditions of children. The aim of this study is the investigation and comparison of anemia and anthropometric indicators between working and non-working children in Kermanshah in the west of Iran.

Material and Methods

This cross-sectional study as a case – control survey was conducted in Kermanshah in the west of Iran in 2013. All subjects were male. The case populations were 8-18 year-old boys who were involved in the collection and sale of scrap materials. The control group subjects were studying in male guidance schools. The case group subjects were selected by convenience sampling and the control group subjects were selected randomly. To adjust background and socioeconomic variables, the schools were selected from the suburbs. The

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samples in this study were 180 children, 90 working and 90 non-working children.

At first a demographic questionnaire was completed that included questions about age, onset of labor, education, parental education and occupation, monthly income of the child, family income and family size.

Dietary patterns were assessed by using Food Frequency Questionnaire (FFQ). Reliability and validity of the questionnaire have already been validated in other studies in Iran [10].

Height, weight, and body mass index (BMI) of subjects were measured as anthropometric parameters. Weights of the participants were measured by using CAMRY Scale, Models EB9320 with an accuracy of 100 g while the subjects were wearing light clothes without wearing shoes.

The height of subjects was measured using height gauge wall, with an accuracy of 1 mm while the subjects were without shoes and their feet were placed together and the hips and shoulders and head were in contact with the wall.

The completion of food frequency Questionnaires and anthropometric measurements were done by a trained nutritionist.

After determining the weight and height of the subjects, BMI was calculated using the weight in kilograms divided by height in meters squared.

Based on monthly income, the economic condition of the population was divided into three categories: good, middle and poor.

5ml vein blood of the participants was collected for investigating the anemia indicators. The tests consisted of CBC, WBC, RBC, HGB, HCT, MCV, MCH, MCHC, PLT and Ferritin.

Anemia was defined according to the WHO criteria [11].

The study was approved by the Ethics Committee of Kermanshah University of Medical Sciences in affiliation to the Iranian Ministry of Health and Medical Education. Written informed consent was obtained from all the participants.

Data analysis was performed with SPSS Version 16. The results are expressed as mean ± SD. For comparison of the groups, Student's t-test and X2 were performed. A P-value less than 0.05 was considered significant.

Results

We managed to analyze the data of the 90 non-working children and due to difficult access to the working children, only 83 samples of the working children were evaluated. The difference of mean of age of working (16.4 ± 1.8 years) and non-working (16.25±1.6 years) children was not significant. The average height, weight, BMI and age of working and non-working children are shown in Table 1. Weight and BMI of working children were significantly lower than those of

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non-working children (Table 1). The prevalence of malnutrition according to BMI was 36.1% in working children.

Table 1: Mean of anthropometric parameters in working and non-working children

Anthropometric Parameters	Mean±S.D		P
	Working children	**Non-working children**	
Weight (kg)	56.4±1.2	62.1±13	0.02
Height (cm)	166.9±10.7	170.6±7.6	0.3
BMI (Kg/m^2)	20.09±3.18	21.25±3.8	0.01

According to the results of this study 15.7% of the working children were illiterate and were not even able to read and write, 72.3% had elementary education and 12% had diploma. The majority of working children had begun to work before the age of 12 (Fig. 1).

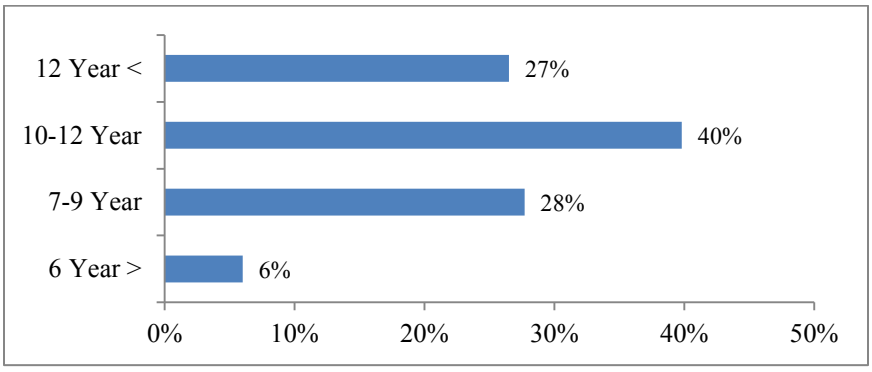

Fig. 1: Frequency of the beginning age of working in labour children

The education level of the children's parents in both groups showed a significant difference (P=0.001). 68.8 percent of fathers and 75.9 percent of mothers of working children were illiterate (Table 2). 39.2% of working children's fathers were unemployed and had no source of income and this rate among non-working children was 4.5%.

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Table 2: Frequency of socioeconomic variables for parents of working and non-working children

Variables		Working children (90)	Non-working children (83)	P
Economic situation (%)	Good	6.03	14.46	0.004
	middle	33.73	46.6	
	Poor	60.2	38.8	
Father's Education (%)	Illiterate	68.8	24.1	0.001
	Under diploma	28.8	59.8	
	Diploma	2.5	16.1	
Mother's Education (%)	Illiterate	75.9	44.3	0.001
	Under diploma	24.1	50	
	Diploma	-	5.7	
Family size (%)	2	2.4	0	0.1
	3	9.63	7.8	
	4	15.6	27.7	
	5 and more	72.3	64.4	

The results of this study show that nearly 60 percent of working children were poor that was significantly more than non-working children (p=0.004).

In working children the consumption of meat, dairy products, fruits and vegetables, were respectively 37.3, 51.2, 36.6, and 39.8 percent less than that recommended in the food pyramid.

The consumption of dairy products (P = 0.001) fruits (P = 0.01) and vegetables (P = 0.06) in the two groups showed a significant difference (Fig.2).

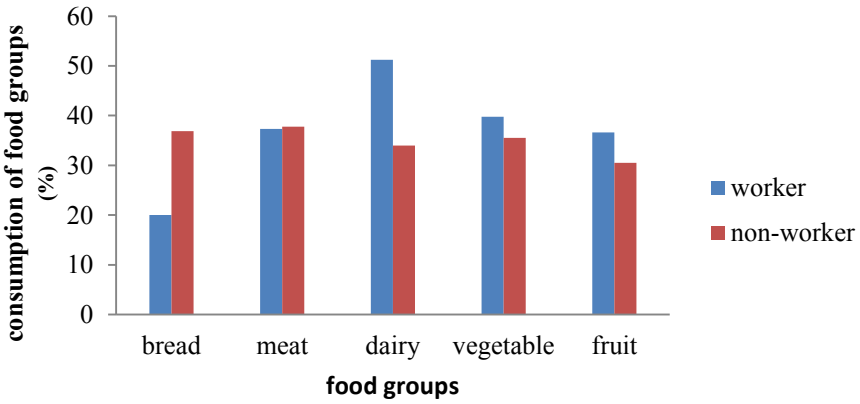

Fig. 2: Frequency of consumption of food groups recommended by the food pyramid

Almost 45 percent of working children and 14 percent of non-working children do not eat breakfast; this difference between the two groups was significant (P<0.001). Lack of lunch meals in 27 percent of working children and only in 6 percent of non-working children was observed (Table 3).

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Table 3: Meal consumption in the studied children

Food Consumption	Working children		Non-working children		P
	Yes (%)	No (%)	Yes (%)	No (%)	
Breakfast	55.6	44.4	85.6	14.4	0.001
Lunch	72.8	27.2	93.8	6.2	0.001
Dinner	81.5	18.5	88.4	11.6	0.1
Snacks	39.5	60.5	33.4	56.6	0.3

According to the WHO criteria, 3.7% of the working children and 2% of the non-working children suffered from iron deficiency anemia and the difference between the two groups was not significant (p= 0.5). Ferritin levels in blood samples of the working children was significantly lower than those of non-working children (72.3±56.1mg/dl vs71.2±34.8 mg/dl, p=0.01).

Discussion

The prevalence of malnutrition according to the BMI was significantly twice more than that of the non-working children. Malnutrition, based on Gomez and Waterlow classifications, was clearly higher in working children than the non-working children. The results of this study are consistent with previous studies. In India, height, weight and indicators of malnutrition among working children were significantly greater than those of non-working children [12]. In Jordan, height-for-age and weight-for-age for boys who were working were significantly less than those of children who were not working [8]. A similar study has shown that working children suffered from retardation in their height growth [13]. In Nigeria the results of a study showed an abnormality in anthropometric indicators in working children [14]. In a study in Jordan, there was a significant negative correlation in working children between duration of working with indicators related to height, weight and body mass index [8].

In this study the results obtained from food frequency questionnaires (FFQ) showed that prevalence of malnutrition and iron deficiency and iron deficiency anemia in working children was more than that of non-working children. Based on questionnaire data it can be concluded that the diet of working children did not have a healthy and nutritious pattern.

In this study the pattern of diet in working children was like a diet which is named energy-dense diet. The main characteristic of this regime is that it is poor in nutrients and rich in energetic sources such as simple carbohydrate and fat. In energy-dense diet the stomach will be full and the cells remain hungry.

Energy-dense diets are usually more common among families with low socio-economic status

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[15]. In this study nearly 60% of the working children lived in families with low socio-economic status. In other parts of the world same results have been reported [16.17]. Working children are one of the most vulnerable groups in society. This vulnerability can be both physical and social. Nutritional disorders in working children can have several reasons.

In order to work, working children often spend many hours of the day away from home. Therefore, access to food prepared at home which is usually healthier and more nutritious than food prepared outside will be limited for them. Consequently, to reduce their hunger working children consume fast foods which are not healthy and do not have a good nutritional status. Usually the income of working children is very low and in most cases, this low income is not spent for their needs but is spent to provide part of the cost of living of their families. The results of a study in Turkey indicated that the income of working children is much less than the amount required for meeting the needs of their lives [17]. In a study in Tehran the poverty of families is expressed as the reason for children's working at an early age [18]. The need to money for family finance was the main cause of children's working at early age in Thailand [19].

In this study, we compared working children with children from the same socio-economic status. Nevertheless, indicators of malnutrition in working children were more than those of the non-working children. Now the question arises that if these children had been compared with middle or upper class children, how the indicators of malnutrition would have been. Given the role of nutrition in health promotion and disease prevention on the one hand, and according to the results of this study about nutritional status of working children on the other, it seems necessary to design a comprehensive and targeted program for nutritional support of working children. Lack of attention to the nutritional needs of working children can lead to serious consequences for these children, their families, communities and health care systems. The main limitation of this study was the reluctance of working children to participate in the study.

Conclusion

In conclusion, the results showed that the nutritional status of working children is not good and needs serious attention.

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