

**HEIGHT, WEIGHT, ARM CIRCUMFERENCE
AND SKINFOLD THICKNESS OF
BAHRAINI CHILDREN
AGED 6 -18 YEARS**

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INTRODUCTION

This report provides data on measurements of height, weight, arm circumference and skinfold thickness of Bahraini school children. The anthropometric measurements were collected in 1986 as a part of the National Nutritional Survey of school children in Bahrain.

Information on health and growth status of the population is essential for administering health and nutrition intervention programmes. Previous nutrition surveys which were carried out in Bahrain are limited in their scope and sampling, and can only give broad indicators to the actual growth norms of the children (Amine, 1980, Mobayed et al, 1980, Blair and Gregory, 1985). The present survey, therefore, was designed to provide more comprehensive and representative data on the growth patterns of Bahraini children aged 6.5-18.5 years.

METHOD

Sampling Technique

Bahrain is mostly an urban country with a limited size (678 km²) and very small population (0.5 million). For the purpose of population census Bahrain is divided into 11 geographical areas. Which differ in sizes and population. The present survey included ten of these areas, and only one was excluded (Hawar Islands) as it has no schools.

A cross-sectional growth survey was conducted in 1986, using a multistage stratified random sampling technique. Information on the school children registered for the school year 1984/85, distributed by sex, geographical area and educational level were obtained from the Ministry of Education. Based on available facilities and feasibility such as trained staff, transportation, funding and timing it was decided to include 2% of the total school children (82699 children) registered for this school year. The sample comprises 1593 Bahraini children (818 boys and 775 girls), ranging in age from 6.5 to

18.5 years. It was attempted to include not less than 40 children of each sex per annual age group. Age was validated from school records, which in turn was based on birth certificates of the children. Age was only considered accurate to the nearest whole year, and children in each group were assumed to be born on June 30 of their birth year.

The sampling procedure performed according to the proportional distribution of children by age and sex in each geographical area. The schools were divided into three educational levels (primary, intermediate and secondary), and the sample was adjusted proportional to these from each area. The schools were numbered and chosen using random tables. The children were selected from each school from school records by a systematic random sampling technique. Only Bahraini children were included in the survey. A replacement sample was selected in each school, to substitute the non-Bahraini children or any drop-outs which render the child void from the study.

Antropometric Measurements

The survey team consisted of five trained researchers and technicians. Weight and height were measured by two persons (one for each sex). Skinfold thickness measurements for boys were performed by one person, while that for girls were performed by two persons. Tests of interobserver error were not conducted.

Weight was measured to the nearest 0.1 kg using a Deteco scale with a 140 kg capacity (Deteco Scales Inc. Brooklyn, N.Y.). The weights were taken without shoes and with as few clothes as possible. Due to cultural factors weight was measured in school uniforms (light shirt and trousers for boys, and light blouse and dress for girls). To minimize the errors in measurements weighting scales were checked before each session as the unloaded scale registers zero. The weighing scale was also frequently checked by known weight object.

In order to get nude weights of children, a sample of 60 children (30 boys and 30 girls) was drawn randomly. Children were divided into three age groups (6.5-10.5, 11.5-15.5, and above 15.5 years), and then ten children were selected randomly from each age group and both sexes. The weight of children with and without clothes was obtained, and the weight of the clothes was calculated. The average weight of clothes was 0.44, 0.56 and 0.61 kg for boys aged 6.5-10.5, 11.5-15.5, and above 15.5 years, respectively; while that for girls was 0.47, 0.53, and 0.64 kg for the corresponding age groups. The weights of these clothes were subtracted from the observed weight of each child for the corresponding age.

Height was measured as the distance between two flat surfaces using a stadiometer attached to the weighing scale. Standing height was measured to the nearest 0.5 cm. The child stood straight, barefooted, with heels, buttocks and back touching the stadiometer. Then the horizontal indicator of the stadiometer was lowered until it was firmly touching the crown of the head.

Upper mid-arm circumference was measured to the nearest 0.1 cm on the left arm (Jelliffe 1966), using spring tension steel tapes (Gulick measuring tape, Country Technology, Inc., North Riverside, Illinois). Skinfold thickness (triceps, biceps, subscapular and suprailliac), were measured in triplicate to the nearest 0.1 mm on the left side. The mean of the three measurements was used in data analysis. Harpenden skinfold calipers were used for skinfold measurements according to the method described by Larson (1974). For the sake of comparison, NCHS reference standards for height and weight (NCHS, 1977), triceps skinfold, and arm circumference (Stephenson, Latham and Hansen, 1983) were used.

Data Analysis

Anthropometric data were analyzed using the SPSS-PC + statistical package. The anthropometric measurements were expressed as mean, median and standard deviation and percentiles (10th, 50th and

90th) for each sex separately. Due to the small sample size, one year interval was used for each age group.

FINDINGS

Sample size per age group, means, medians and standard deviations for all anthropometric measurements for boys and girls are presented in Tables 1-7. Whereas, observed percentiles for all anthropometric measurements are given in Tables 8 to 14. Mean values for height and weight increase with age in both sexes, except for girls aged 17.5 and 18.5 years where the height does not increase at age 17.5 years and decrease slightly (by 1 cm) at age 18.5 years. The variation in height and weight increases with age in both sexes, with more variation among the weight of boys at age 13.5 years and above. Height is less variable with age in both boys and girls.

In both sexes arm circumference also increases with age. The mean triceps and biceps skinfolds of boys decrease slightly, by age 16.5 and above, whereas in girls these thickness continue to increase with age. At the subscapular and suprailliac sites, girls have means which are greater than boys at every age. The differences in these sites between boys and girls are almost double.

Sex difference in height and weight of Bahraini children are almost negligible between 6.5 to 10.5 years of age. At about 11 years, girls are taller and heavier than boys, and maintain this size advantage through 13.5 years of age in height and 15.5 years in weight. After 14 years boys are on the average taller, and after 16.5 years they are heavier than girls.

In general the median (50th percentiles) height of Bahraini children fluctuates between 25th and 5th percentiles of the reference data US NCHS standard (NCHS, 1977). In boys the median height fall between 25th and 10th percentiles for ages 7.5 to 11.5 years, then the median become almost at 10th percentiles (except for age 17.5 years). However, the situation is slightly differed in girls. The median

height fluctuates between 25th and 5th percentiles for age 7.5 to 11.5 years. For age 12.5 years onwards, the median height fluctuates between 25th and 10th percentiles (except for age 18.5 years). For boys aged 6.5 to 11.5 years the median weight fluctuates between 25th and 10th percentiles. The median then falls below 10th percentiles for the rest age groups (except for age 16.5 years). In girls the median weight fluctuates between the 50th and 10th percentile (Figures 1-2).

The median arm circumference for Bahraini boys lies slightly below or close to 5th percentile of the standard. Similar picture is seen in girls, however the median is more closer to 5th percentiles than in boys. The median triceps skinfold for Bahraini boys fluctuates between 50th and 25th percentiles, except for age 15.5 years where the median exceed the 50th percentile. The median triceps of Bahraini girls also fluctuates between 50th and 25th percentiles of the standard (Figures 3-6).

DISCUSSION

Bahraini children are shorter and lighter than North American children for all age groups studies. Although the NCHS growth charts may not be entirely appropriate for comparison with the growth of school-age children in less developed countries, they permit valid comparison against other groups of children in other parts of the world (Gracey 1987). The small body size of Bahraini children in relation to U.S. children can be attributed to various genetic, health, socioeconomic and environmental factors.

Unfortunately, due to the way in which the data of previous surveys in Bahrain (Amine 1980, Mobayed et al. 1980) were presented, it is difficult to compare our findings with the results reported in these surveys (means and percentiles were not provided). However, the growth patterns of Bahraini girls in the present study compare favourably with those reported by Blair and Gregory (1985) for Bahraini girls aged 7-17 years. For both boy and girls Bahraini

children growth showed a development pattern similar to those of Kuwaiti children reported by Eid, et al (1986). Nevertheless the Bahraini children are slightly shorter and lighter than Kuwaiti children.

Girls begin to show significantly higher skinfold thickness than boys at age 6.5 years and this difference continues for every age group up to 18.5 years of age. In general, skinfold thicknesses of children in this study indicates substantial subcutaneous fat deposition. Considering the very small arm circumferences seen at all ages and for both sexes, the muscle area of these children appears to be underdeveloped. This picture was also seen by Blair and Gregory (1985) among Bahraini girls. The lack of physical exercise and high dietary energy intake are considered to be the main factors responsible for accumulation of fat among children in Bahrain. The low level of physical activity would also lead to reduced muscular development. Zaghoul, et al., (1984) found that most Bahraini girls are less active and consume higher amounts of daily food energy.

Exercise programmes in schools, therefore, should be given more emphasis. Attention should also be paid to the school feeding and nutrition education programmes to improve the nutritional status of school children in Bahrain. Anthropometric measurements provided in this study are most useful in the management programme for under and over nourished children, and in the follow-up of diseases associated with change in body composition. It is recommended that such a study should be repeated periodically to assess any alteration in the growth patterns of the children in the country.

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Table 1. Mean, median and standard deviation (SD) for height (cm) for Bahraini boys and girls (6.5-18.5 years).

Age (years) (Mid-point)	Boys				Girls			
	N	Mean	Median	SD	N	Mean	Median	SD
6.5	22	117.5	119.0	5.2	23	115.1	115.0	3.6
7.5	75	118.7	119.0	4.7	81	117.4	118.0	5.9
8.5	69	123.6	123.0	5.4	84	123.8	124.0	6.8
9.5	76	129.1	130.0	5.7	73	127.7	126.0	10.7
10.5	68	133.9	134.0	6.1	81	134.0	133.0	6.7
11.5	81	137.4	138.0	7.1	51	140.3	138.0	9.2
12.5	66	143.1	142.3	7.8	57	146.8	147.2	7.8
13.5	65	149.0	149.5	7.7	47	151.4	152.0	7.3
14.5	74	155.5	154.5	8.2	71	153.0	153.8	6.3
15.5	72	159.6	161.3	8.2	59	155.1	155.1	6.2
16.5	62	166.9	166.0	7.6	43	156.4	156.8	5.5
17.5	48	166.9	166.0	8.3	56	155.4	155.0	5.1
18.5	40	169.1	169.3	6.6	49	154.0	154.0	5.1

Table 2. Mean, median and standard deviation (SD) for weight (kg) for Bahraini boys and girls (6.5-18.5 years).

Age (years) (Mid-point)	Boys				Girls			
	N	Mean	Median	SD	N	Mean	Median	SD
6.5	22	19.7	19.1	3.1	23	20.1	19.5	3.4
7.5	75	20.3	20.1	2.3	81	20.6	19.5	4.6
8.5	69	23.0	22.6	3.7	84	23.8	22.5	5.8
9.5	76	25.7	25.1	4.8	73	24.8	23.5	7.1
10.5	68	28.4	27.3	6.1	81	30.0	27.3	8.6
11.5	81	30.8	29.4	7.4	51	34.5	32.2	11.1
12.5	66	34.7	32.2	8.4	57	39.6	37.7	10.4
13.5	65	40.7	37.4	12.5	47	43.5	43.8	10.9
14.5	74	46.3	42.2	12.6	71	47.8	45.7	10.8
15.5	72	48.0	46.9	15.0	59	51.7	48.0	11.2
16.5	62	54.6	53.4	8.2	43	50.1	48.1	11.1
17.5	48	57.7	54.9	14.0	56	53.9	50.5	13.0
18.5	40	60.0	57.9	11.0	49	51.4	49.4	11.0

Table 3. Mean, median and standard deviation (SD) for mid-arm circumference (cm) for Bahraini boys and girls (6.5-18.5 years).

Age (years) (Mid-point)	Boys				Girls			
	N	Mean	Median	SD	N	Mean	Median	SD
6.5	22	15.3	15.2	1.3	23	16.2	15.7	1.6
7.5	75	15.5	15.5	1.1	81	15.8	15.7	2.0
8.5	70	16.3	16.1	1.5	84	16.9	16.2	2.9
9.5	76	16.7	16.6	2.2	73	16.7	16.4	2.1
10.5	68	17.3	17.2	3.0	81	18.3	17.4	3.2
11.5	81	18.1	17.7	2.7	51	19.4	18.5	3.6
12.5	66	18.9	18.4	3.5	57	20.4	19.6	3.1
13.5	65	20.0	19.8	5.0	47	21.3	20.9	3.7
14.5	74	21.2	20.2	4.4	71	22.5	21.5	3.7
15.5	72	22.6	22.0	4.3	59	22.9	22.3	4.2
16.5	62	23.2	23.0	2.3	43	22.7	22.0	3.6
17.5	48	24.1	23.7	3.9	56	23.7	23.0	4.1
18.5	40	25.2	23.9	3.8	49	23.1	22.5	3.5

Table 4. Mean, median and standard deviation (SD) for Biceps (mm) for Bahraini boys and girls (6.5-18.5 years).

Age (years) (Mid-point)	Boys			Girls				
	N	Mean	Median	SD	N	Mean	Median	SD
6.5	22	4.1	3.7	1.2	23	6.2	5.6	2.6
7.5	75	4.0	3.8	1.0	81	5.5	5.0	2.2
8.5	69	4.4	4.3	1.7	84	6.2	5.8	2.7
9.5	76	4.6	3.9	1.8	73	5.6	5.4	2.2
10.5	68	4.5	3.8	2.3	81	6.7	5.6	3.7
11.5	81	5.3	4.0	3.2	51	6.9	5.8	3.4
12.5	66	5.8	4.2	4.5	57	7.9	7.0	3.7
13.5	65	5.9	4.2	4.5	47	7.6	7.4	2.9
14.5	74	5.8	4.1	4.1	71	9.0	8.4	4.2
15.5	72	6.0	4.4	4.3	59	9.4	8.5	4.5
16.5	62	4.6	4.1	2.0	43	8.3	7.2	3.9
17.5	48	4.8	3.5	3.2	56	9.2	8.1	3.9
18.5	40	5.2	4.0	2.9	49	8.5	7.2	3.7

Table 5. Mean, median and standard deviation for triceps (mm) for Bahraini boys and girls (6.5-18.5 years)

Age (years) (Mid-point)	Boys				Girls			
	N	Mean	Median	SD	N	Mean	Median	SD
6.5	22	7.6	7.4	2.2	23	9.9	9.5	3.1
7.5	75	7.4	7.2	2.0	81	9.8	9.0	3.6
8.5	69	8.0	7.3	2.9	84	10.4	9.6	4.2
9.5	76	8.4	7.6	3.3	73	9.8	9.6	3.4
10.5	68	8.2	7.2	3.8	81	11.7	10.6	5.6
11.5	81	9.2	7.3	5.1	51	11.6	10.2	4.6
12.5	66	10.3	8.4	5.1	57	12.6	11.6	5.1
13.5	65	10.6	8.3	6.8	47	12.8	11.8	4.9
14.5	74	10.4	7.9	6.3	71	15.2	14.0	6.5
15.5	72	11.3	8.9	7.4	59	16.1	14.6	6.0
16.5	62	8.2	6.9	3.4	43	14.8	13.6	5.2
17.5	48	9.5	7.2	6.6	56	17.0	16.3	6.0
18.5	40	9.7	7.4	5.5	49	15.8	15.1	5.1

Table 6. Mean, median and standard deviation (SD) for subscapular (mm) for Bahraini boys and girls (6.5-18.5 years)

Age (years) (Mid-point)	Boys			Girls				
	N	Mean	Median	SD	N	Mean	Median	SD
6.5	22	4.8	4.7	0.9	23	7.1	5.6	3.3
7.5	75	4.9	4.7	1.3	81	6.1	5.0	3.9
8.5	69	5.2	4.8	1.8	84	7.3	5.6	4.6
9.5	76	5.7	5.0	2.9	73	6.9	5.6	4.2
10.5	68	6.2	5.0	4.6	81	9.0	6.4	6.1
11.5	81	7.3	5.4	5.4	51	9.5	7.4	6.9
12.5	66	7.5	5.6	5.5	57	10.7	8.6	6.1
13.5	65	8.3	5.6	6.9	47	11.8	10.1	5.3
14.5	74	9.3	6.4	7.3	71	14.3	13.4	6.5
15.5	72	10.3	6.6	8.2	59	16.0	14.3	7.9
16.5	62	8.4	7.1	4.3	43	14.0	12.6	6.0
17.5	48	9.4	7.6	6.7	56	17.2	15.0	7.4
18.5	40	11.9	8.6	8.7	49	16.0	13.8	7.5

Table 7. Mean, media, standard deviation (SD) for suprailliac (mm) for Baharaini boys and girls (6.5-18.5 years)

Age (years) (Mid-point)	Boys				Girls			
	N	Mean	Median	SD	N	Mean	Median	SD
6.5	22	3.5	3.4	1.2	23	6.8	5.2	3.6
7.5	75	3.5	3.3	0.8	81	5.6	4.6	3.4
8.5	69	3.9	3.4	1.6	84	6.7	5.2	4.3
9.5	76	4.6	3.8	2.7	73	6.2	5.2	3.9
10.5	68	4.8	3.7	3.7	81	8.5	6.2	6.8
11.5	81	6.2	4.0	5.9	51	9.0	7.5	5.5
12.5	66	6.2	4.5	4.3	57	10.6	8.2	5.3
13.5	65	7.1	4.6	6.2	47	12.1	10.1	5.7
14.5	74	7.9	5.0	6.7	71	14.0	12.0	6.9
15.5	72	9.3	5.0	8.3	59	15.9	13.6	7.8
16.5	62	6.9	5.6	4.3	43	13.6	12.2	5.6
17.5	48	7.9	5.6	6.9	56	16.0	14.3	6.9
18.5	40	10.3	6.9	9.0	49	16.3	14.2	6.9

Table 8. Observed percentiles for height (cm) for Bahraini boys and girls (6.5-18.5 years)

Age (years) (Mid-point)	Boys				Girls			
	N	10th	50th	90th	N	10th	50th	90th
6.5	22	107.6	119.0	123.0	23	109.3	115.0	120.0
7.5	75	112.8	119.0	124.0	81	110.0	118.0	124.9
8.5	69	117.5	123.0	131.0	84	116.0	124.0	132.7
9.5	76	121.9	130.0	136.3	73	117.2	126.0	136.0
10.5	68	126.0	134.0	141.6	81	126.0	133.0	143.8
11.5	81	128.5	138.0	146.4	51	128.6	138.0	154.1
12.5	66	134.9	142.3	153.7	57	136.2	147.2	155.2
13.5	65	139.5	149.5	158.0	47	143.2	152.0	160.7
14.5	74	145.0	154.5	167.3	71	145.1	153.8	160.0
15.5	72	148.6	161.3	168.0	59	147.8	155.1	163.2
16.5	62	158.0	166.0	177.1	43	147.9	156.8	164.6
17.5	48	154.0	166.0	178.6	56	149.6	155.0	162.0
18.5	40	160.2	169.3	176.0	49	147.5	154.0	162.0

Table 9. Observed percentiles for weight (kg) for Bahraini boys and girls (6.5-18.5 years)

Age (years) (Mid-point)	Boys			Girls				
	N	10th	50th	90th	N	10th	50th	90th
6.5	22	15.9	19.1	23.6	23	16.4	20.0	26.4
7.5	75	17.1	20.1	23.7	81	16.6	20.0	28.1
8.5	69	19.1	22.6	26.1	84	18.0	23.0	33.0
9.5	76	20.6	25.1	31.9	73	19.5	24.0	29.9
10.5	68	22.6	27.3	37.7	81	23.0	27.8	43.3
11.5	81	23.9	29.4	43.1	51	25.6	32.7	44.9
12.5	66	26.9	32.2	46.5	57	27.5	38.2	56.1
13.5	65	27.9	37.4	61.5	47	30.9	44.3	56.9
14.5	74	33.2	42.2	67.7	71	38.0	46.2	63.9
15.5	72	33.3	46.9	64.4	59	39.6	48.5	67.5
16.5	62	45.5	53.4	65.2	43	38.6	48.8	65.9
17.5	48	40.8	54.9	80.7	56	43.9	51.1	73.6
18.5	40	47.7	57.9	78.3	49	41.5	50.0	63.5

Table 10. Observed percentiles for mid-arm circumference (cm) for Bahraini boys and girls (6.5-18.5 years).

Age (years) (Mid-point)	Boys			Girls				
	N	10th	50th	90th	N	10th	50th	90th
6.5	22	14.0	15.2	17.1	23	14.5	15.7	19.1
7.5	75	13.9	15.5	16.5	81	13.8	15.7	18.6
8.5	69	14.8	16.1	17.7	84	14.0	16.2	21.7
9.5	76	14.6	16.6	19.6	73	15.0	16.4	18.9
10.5	68	15.5	17.1	21.6	81	15.4	17.4	23.0
11.5	81	15.3	17.7	21.0	51	16.0	18.5	24.3
12.5	66	16.1	18.4	23.1	57	16.4	19.6	24.7
13.5	65	17.1	19.8	26.1	47	17.2	20.9	26.0
14.5	74	17.8	20.2	28.1	71	18.7	21.5	26.9
15.5	72	18.0	22.0	29.1	59	18.6	22.3	28.7
16.5	62	20.3	23.0	25.9	43	19.0	22.0	27.7
17.5	48	19.3	23.7	30.2	56	19.5	23.0	28.5
18.5	40	21.6	23.9	31.1	49	20.0	22.5	28.2

Table 11. Observed percentiles for biceps (mm) for Bahraini boys and girls (6.5-18.5 years)

Age (years) (Mid-point)	Boys				Girls			
	N	10th	50th	90th	N	10th	50th	90th
6.5	22	2.8	3.7	6.4	23	3.6	5.6	9.8
7.5	75	2.8	5.8	5.3	81	3.8	5.0	7.8
8.5	69	3.1	4.2	5.4	84	3.6	5.8	10.0
9.5	76	3.0	3.9	6.7	73	3.6	5.4	7.5
10.5	68	2.8	3.8	7.9	81	3.6	5.6	10.8
11.5	81	3.1	4.0	10.1	51	4.0	5.8	10.1
12.5	66	3.2	4.2	10.0	57	4.4	7.0	12.8
13.5	65	3.0	4.2	12.4	47	4.5	7.4	11.4
14.5	74	3.3	4.1	11.4	71	4.4	8.4	14.4
15.5	72	3.1	4.4	13.0	59	4.8	8.5	16.8
16.5	62	3.0	4.1	6.6	43	4.6	7.2	14.7
17.5	48	3.0	3.5	8.6	56	4.9	8.1	13.6
18.5	40	3.1	4.0	10.5	49	4.8	7.2	14.4

Table 12. Observed percentiles for triceps (mm) for Bahraini boys and girls (6.5-18.5 years).

Age (years) (Mid-point)	Boys			Girls				
	N	10th	50th	90th	N	10th	50th	90th
6.5	22	4.9	7.4	11.3	23	5.8	9.5	15.5
7.5	75	4.9	7.2	10.1	81	6.8	9.0	16.0
8.5	69	5.7	7.3	11.2	84	6.1	9.6	17.4
9.5	76	5.2	7.6	12.4	73	6.0	9.6	12.8
10.5	68	5.3	7.2	13.1	81	6.2	10.6	20.1
11.5	81	5.4	7.3	17.1	51	7.6	10.2	16.8
12.5	66	5.6	8.4	17.4	57	6.8	11.6	20.3
13.5	65	4.7	8.3	21.0	47	7.7	11.8	18.6
14.5	74	5.3	7.9	19.4	71	7.9	14.0	23.4
15.5	72	5.1	8.9	22.3	59	9.6	14.6	25.8
16.5	62	5.2	6.9	12.5	43	9.0	13.6	24.2
17.5	48	4.8	7.2	19.5	56	10.1	16.3	26.0
18.5	40	5.2	7.4	20.3	49	9.4	15.1	23.4

Table 13. Observed percentiles for subscapular (mm) for Bahraini boys and girls (6.5-18.5 years).

Age (years) (Mid-point)	Boys				Girls			
	N	10th	50th	90th	N	10th	50th	90th
6.5	22	3.7	4.7	5.6	23	4.0	5.6	12.5
7.5	75	3.7	4.7	5.8	81	3.8	5.0	10.1
8.5	69	4.2	4.8	6.2	84	4.1	5.5	14.2
9.5	76	3.9	5.0	8.1	73	4.7	5.6	9.6
10.5	68	4.4	5.0	9.5	81	4.6	6.4	19.4
11.5	81	4.2	5.4	14.5	51	5.2	7.4	14.4
12.5	66	4.6	5.6	13.2	57	5.6	5.6	20.3
13.5	65	4.4	5.6	17.9	47	6.5	10.1	20.9
14.5	74	4.8	6.4	19.2	71	7.6	13.4	23.1
15.5	72	4.8	6.6	19.2	59	8.2	14.3	27.5
16.5	62	5.9	7.1	11.4	43	8.0	12.6	24.1
17.5	48	5.2	7.6	18.4	56	9.5	15.0	29.0
18.5	40	6.4	8.6	29.7	49	9.2	13.8	28.8

Table 14. Observed percentiles of suprailliac (mm) for Bahraini boys and girls (6.5-18.5 years).

Age (years) (Mid-point)	Boys			Girls				
	N	10th	50th	90th	N	10th	50th	90th
6.5	22	2.5	3.4	4.9	23	3.6	5.2	14.2
7.5	75	2.6	3.3	4.9	81	3.2	4.6	9.4
8.5	69	2.9	3.4	5.0	84	3.4	5.2	14.2
9.5	76	2.7	3.8	7.3	73	3.9	5.2	8.3
10.5	68	3.0	3.7	7.9	81	4.0	6.2	18.1
11.5	81	2.8	4.0	14.7	51	4.6	7.5	15.2
12.5	66	3.2	4.5	12.3	57	5.2	8.2	19.2
13.5	65	3.2	4.6	18.3	47	6.0	10.1	22.2
14.5	74	3.4	5.0	19.9	71	7.4	12.0	23.2
15.5	72	3.7	5.0	22.3	59	7.4	13.6	27.8
16.5	62	4.0	5.6	12.8	43	6.6	12.2	23.8
17.5	48	4.0	5.7	17.4	56	8.3	14.3	27.2
18.5	40	4.3	6.9	28.6	49	9.6	14.2	28.2

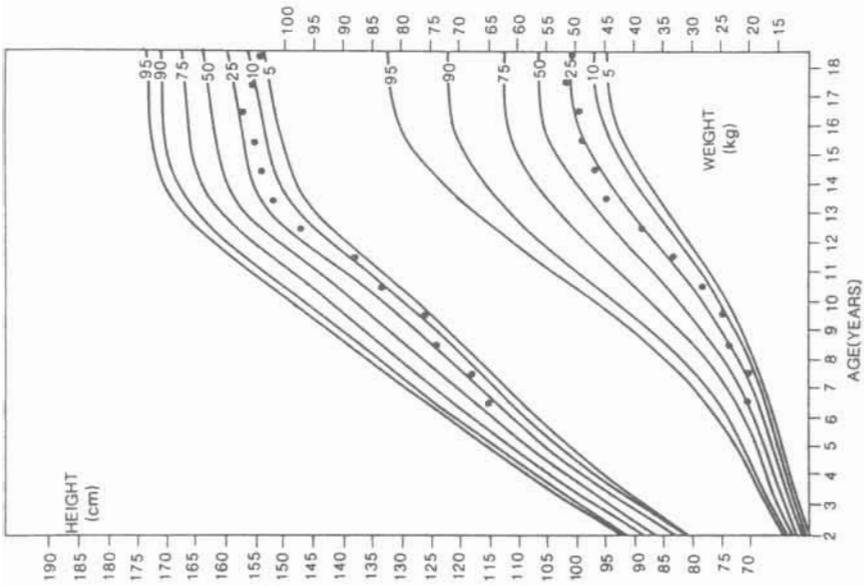


Figure 1 Median height and weight of Bahraini female children plotted on NCHS smoothed percentiles for females aged 6-18 years.

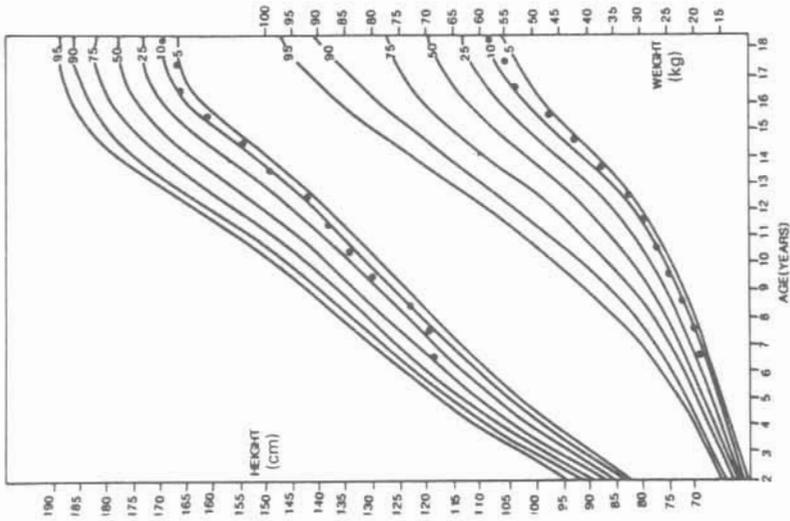


Figure 2 Median height and weight of Bahraini male children plotted on NCHS smoothed percentiles for males aged 6-18 years.

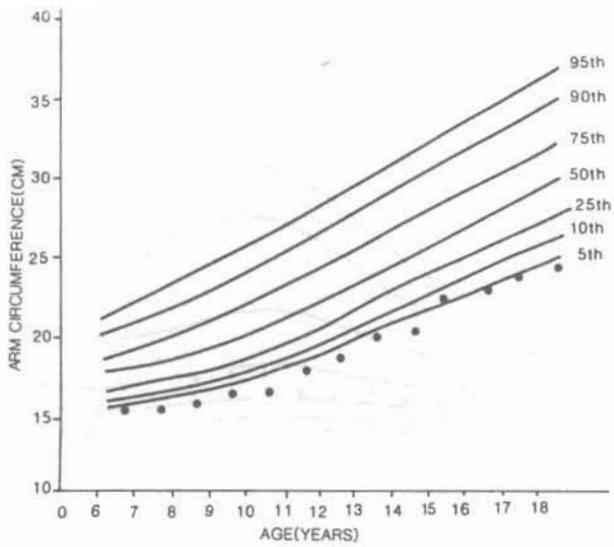


Figure 3 Median arm circumference of Bahraini males plotted on NCHS smoothed percentiles for males aged 6-18 years.

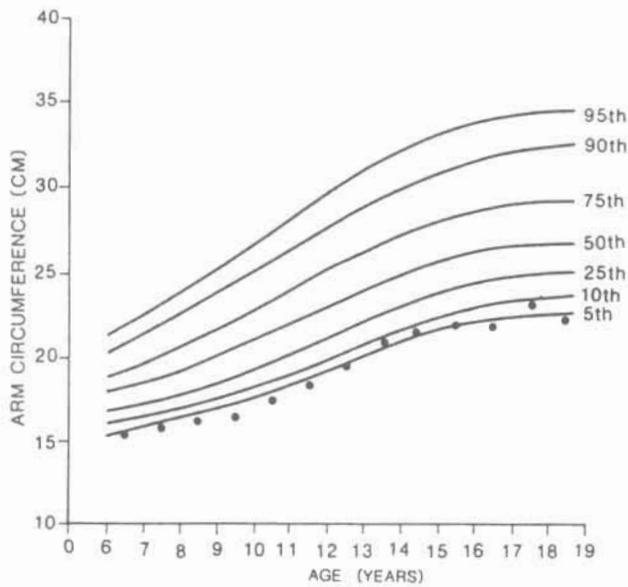


Figure 4 Median arm circumference of Bahraini females plotted on NCHS smoothed percentiles for females aged 6-18 years.

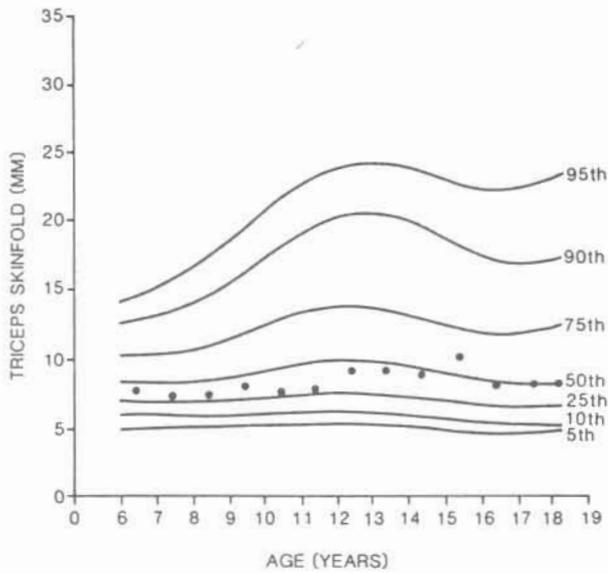


Figure 5 Median triceps skinfold thickness of Bahraini males plotted on NCHS smoothed percentiles for males aged 6–18 years.

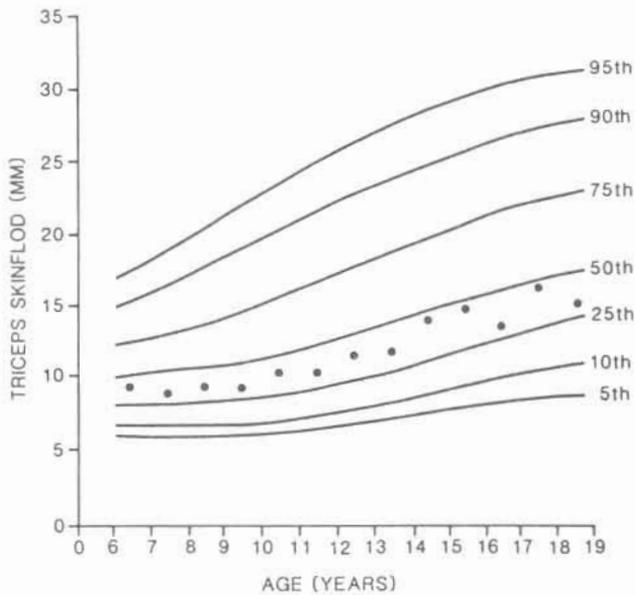


Figure 6 Median triceps skinfold thickness of Bahraini females plotted on NCHS smoothed percentiles for females aged 6–18 years.

