

Socio-economic discrepancies in growth status of Jordanian children in military-run schools at the turn of the twentieth century

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The State of the World's Children, 1996, reported by the UNICEF¹ showed that the percentage of Jordanian children under-5 (1980-1994) suffering from moderate and severe underweight, wasting and stunting was 9%, 2% and 16%. Growth-restricted children have significantly poorer performance than non-growth-restricted children on a wide range of cognitive test.² To assess differences in health and nutrition between groups in a population, growth charts have to be locally established. Until local charts are available, the use of the available Centers for Disease Control/United States of America (CDC/USA)growth charts³ permits international comparisons of the impact of various environmental factors, such as poverty and infection on the overall growth of children.

We have undertaken a survey to measure multiple health indicators in school children aged 6.5-17.5 years, among which were height and weight in addition to other socio-economic indicators. The purpose of this paper is to investigate the extent of differences in BMI in both urban and Southern Badia Jordanian school children, and compare them with CDC/USA standards. Military-run schools are spread all over Jordan and open for all citizens. Only 16.2% of the students in these schools have a parent who is a member of the Armed Forces, while the rest have civilian parents. The present report deals exclusively with different BMI among male students from 2 socio-economically-distinct regions: the poor Southern region and the better off middle urban region including the capital Amman and Zarka city, Jordan. Socio-demographic data were obtained using a structured questionnaire prepared specifically for the purpose of this study. Questionnaires were distributed to the students who were asked to pass them to their parents to be completed and returned in the next day. Measurement of height and weight in standardized methods and recorded the nearest 0.1cm and 0.1kg. Data were entered into computer using DB3 Plus software and analyzed using the Statistical Package for Social Sciences. **Table 1** presents the socio-economic characteristics of the students in the middle and Southern regions. Consanguinity was more common in the Southern than the middle region (65% versus 50%) P= 0.001. Southern students tend to belong to families with lower educational levels, lower incomes and a larger number of children.

The total number of boys was 5223 distributed in the 2 regions, the middle region 2762 (52.9%) and Southern

Table 1 - Socio-economic characteristics of the study population.

Variables	Middle region (N=2762)	Southern region (N=2460)	p-value
Consanguinity between parents	(50)	(65)	
Fathers' education. Primary school or less	(8.1)	(30.4)	0.48
Mother's education. Primary school or less	(13)	(74.2)	0.04
	Family income (JD/month.)*		
≤150	(25.2)	(69)	
151-250	(39.3)	(23.2)	
251-350	(21.1)	(6.6)	
≥351	(14.4)	(1.2)	
Mean number of sibling/family	6.13	8.51	0.003

*Jordanian Dinars = 1.4 USA Dollars

Badia of Jordan, 2461 (47.1%). A demographic description and the average family income in Jordanian Dinars (JD)/month of the study population is given in **Table 1**. The most economically underprivileged groups in the population under study are those living in the Southern Badia region, were only 1.2% of the population had an income of more than 351 JD/ month, and 69% had an income of less than 150 JD/month. Sixty percent of the students were products of consanguineous marriages. The number of siblings per family among the study population was 7.3; it accounts for 8.5 in the Badia region and 6.1 in the urban area. This study showed the BMI status of Jordanian school children aged 6.5-17.5 years. There are obvious discrepancies demonstrated between the urban and Southern Badia Jordanian school children in their BMI, which, are likely to be of some relevance to practicing clinicians and to the decision makers. Jordanian school children living in the Southern Badia region have significantly lower BMI <5th percentile (P<0.005), than their counterpart living in the urban region at all age groups under study. Growth is the result of the interaction of genetic makeup, nutritional factors, hormones, metabolism and cerebro-cortical influences.⁴ Consanguineous mating in Jordan was reported by Khoury and Massad⁵ to be 50% among Moslems and Christians, but reached 50% and 65% in the urban and Southern Badia in the current study. If any measure is to be taken to improve the growth parameters of children from the Badia region, it should be very early on life, as, benefits to growth occurred when intervention began in pregnancy and continued for at least the first 3 years of life.⁶

It is worrisome that obesity (BMI> 95th centile) among Jordanian school children living in urban region

is 3.9%, 10.9%, and 5.7% at 6.5, 13.5 and 17.5 years of age in comparison with their age matched children whose BMI 0.7%, 2.2% and 0.8%. This may be related to the lack of activity among Jordanian school boys living in the urban region and the tendency to stay at home where an increased amount of time is being spent viewing television as a pastime and less time spent in sport activities. It has been reported that decreasing television, videotape and video game use may be a promising population-based approach to prevent childhood obesity.⁷ It is open to question if large size is advantageous. Although in the recent past, the best nutrition has often been equated with the most food that can be obtained, it is now accepted that too much may be harmful as too little.⁸ As these schools are open to all sectors of the population, we have no reason to believe that our children are different from the rest of school children in the country. It is hoped that the present study will encourage the health authorities in Jordan to conduct national growth studies in the country aiming towards constructing national standards for growth of Jordanian children to replace the international reference growth charts in current use.

In conclusion, the study has shown that there is a higher poverty in the Badia region and there was a tendency for boys in urban regions to be obese. Thus, by improving the socioeconomic conditions, family planning, health education regarding obesity and genetic education with regards to consanguinity, our children may grow better to achieve their genetic potentials for growth.

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References

- Bellamy C. The state of the world's children. 50th anniversary issue. Statistical Table of nutrition. New York (NY): Oxford University Press; 1996. p. 83.
- Walker SP, Grantham SM, Powell CA, Chag SM. Effects of growth restriction in early childhood on growth, IQ, and cognition at age 11 to 12 years and the benefits of nutritional supplementation and psychosocial stimulation. *J Pediatr* 2000; 137: 36-41.
- CDC growth charts. A revised version (2000) of the 1977 NCHS growth charts is called CDC growth charts. Available from URL: <http://www.cdc.gov/growthcharts>.
- Walker SP, Grantham-McGregor SM, Himes JH, Powell CA, Chag SM. Early childhood supplementation does not benefit the growth of stunted children in Jamaica. *J Nutr* 1996; 126: 3017-3053.
- Khoury SA, Massad D. Consanguineous marriage in Jordan. *Am J Med Gen* 1992; 43: 769-775.
- Martorell R, Schroeder DG, Rivera JA, Kaplowitz HJ. Patterns of linear growth in rural Guatemalan adolescents and children. *J Nutr* 1995; 125: 1060S-1067S.

- Robinson TN. Reducing children's television viewing to prevent obesity. A randomized controlled trial. *JAMA* 1999; 282: 1561-1567.
- Koplan JP, Dietz WH. Caloric imbalance and public health policy. *JAMA* 1999; 282: 1579-1580.

The prevalence of hepatitis B carrier state in Khorassan province of Iran

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It was predicted that at least 400 million cases of hepatitis B chronic infection occurred by the year 2000 worldwide,¹ and now the figure has risen beyond this limit. According to the Center for Disease Control and Prevention (CDC) fact sheets, published on its website, hepatitis B infection has an acute case fatality rate of 0.5-1% and 2-10% of cases end up in chronic infection after 5 years. Premature mortality from chronic liver disease occurs in 15-25% of chronically infected persons, pointing to the importance of this global concern. In Iran, several studies have been performed to determine the prevalence of hepatitis B carrier state. In 1980s, almost 3% of population was affected, differing from a prevalence rate of 1.7% in Fars province to 5% in Sistan-Baluchestan province.² Fifty-one to 56% of Iranian cirrhotic patients were hepatitis B surface antigen (HBsAg) positive,^{3,4} pointing to the importance of this infecting agent and its socio-economic burden in this country. With respect to the importance of this virus and its devastating consequences on society, for the first time in 1998, in a study that was performed in healthy population of Khorassan province, Iran, we tried to determine the prevalence of hepatitis B carrier state. Khorassan is the biggest province of Iran and it is located in the northeast.

This was a cross-sectional descriptive and quantitative study that was conducted on healthy population of Khorassan province in Iran in 1998. The subjects were in the age-range of 2-100 years from both genders. With regard to estimated prevalence of hepatitis B carrier state, a sample number of 4528 was considered to result in a meaningful outcome at the statistical significant level of 95%. According to the distribution of population, and based on the list of the places under the observation of the medical centers and traveling teams in rural areas and according to the list of the families who were vaccinated against poliomyelitis in 1996 in urban areas, the population under study was divided into 164 randomly selected sample clusters with 8 families in each cluster, 97 clusters were from urban and 67 clusters from rural areas. The data was obtained through completion of a questionnaire and taking blood samples, which were later examined in a medical laboratory in the center of province, detecting HBsAg by enzyme-linked immunosorbent assay (ELISA) method. We finally calculated the prevalence of carrier state in 100 patients