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Short Stature in Primary school children in Hun city, Libya

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Abstract:
Short stature is a common problem globally, Children suffering short in length have also been reported to be correlated with stigmatization and become introverted which can cause chronic psychosocial stress, also has been found SS causes many metabolic syndrome like obesity and type 2 diabetes. Short stature is defined as height or length below 3rd per centile for that age and gender. This study amid to investigated the prevalence of short stature among primary public school students aged 8 years in the city of Hun. *Methodology*: data were collected from 333 students, 8 years old, in six different background primary schools in the city of Hun, height and weight were measured for all healthy children's data was plotted on suitable growth charts. The sum of all lower height and weight boys and girls were calculated in each school to make a percentage for each. *Results* In total of, 333 students aged 8years were screened 44 of them were found to have short stature, in percentage of 11.25% for boys, and 15.02% for girls, A study conducted in Saudi Arabia reported that the prevalence of short stature in children was 11.3% in boys and 10.5% in girls. *In conclusion,* this survey study revealed the extent prevalence of short stature among primary school children in the city of Hun, Libya.

Keywords: Short Stature, Health, Student, Weight, Growth.
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قصر القامة بين أطفال المدارس الابتدائية في مدينة هون، ليبيا

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الملخص
قصر القامة معضلة عالمية شائعة، قد وجد من دراسات سابقة ان الأطفال الذين يعانون قصر في الطول انه لديهم الشعور بوصمة العار وانهم يصبحون انطوائيون الأمر الذي يؤدي الي العزلة الاجتماعية. قد ثبت أن قصر القامة يتسبب عنه مشاكل مرتبطة في عمليات الأيض مثل داء السكري من النوع 2 والسمنة. يعرف قصر القامة هو أن يكون قياس الطول أو ارتفاع الطفل تحت الخط المئوي الثالث بالنسبة للعمر والجنس للأطفال الأصحاء. هدفت هذه الدراسة الي التحقق من انتشار قصر القامة بين أطفال المدارس الابتدائية الذين أعمارهم 8 سنوات في مدينة هون. المنهجية: جمعت البيانات من عدد 333 من الطلبة ممن أعمارهم 8 سنوات من عدد 6 مدارس ابتدائية من خلفيات عرقية مختلفة من مدينة هون، تم قياس الطول والوزن لجميع الأطفال. قورنت البيانات مع منحني النمو المناسب. تم حساب مجموع أطوال وأوزان الأولاد والبنات الذين لهم وزن وطول أقل في كل مدرسة لحساب النسبة المئوية لكل منهم. *النتائج:* مجموع 333 طالب وطالبة عمر 8 سنوات تمت معالجة بياناتهم 44 منهم وجد انهم يعانون من قصر القامة بنسبة

11.25% للأولاد و 15.02% للبنات. في دراسة أجريت في المملكة العربية السعودية أظهرت ان نسبة قصر القامة عند الأطفال بلغت 11.3% للأولاد و10.5% للبنات. *الخلاصة:* هذه الدراسة المسحية بينت نسبة انتشار قصر القامة بين أطفال المدارس الابتدائية في مدينة هون، ليبيا.
الكلمات المفتاحية: قصر القامة، الصحة، الطلاب، الوزن، النمو.

Introduction

Human growth is regulated by genetic, hormonal, nutritional and environmental factors that interact to culminate in a series process of cell replication in all living tissue [5] Healthy children are a requirement that all parents around the world seek. The healthy growth of children can be estimated based on age and gender are signals of the child's growth welfare. Scientifically height vertex can be defined as the height of an individual measured from the ground to the vertex, with the head held in the Frankfurt-Horizontal plane [17].

Short stature is a universal problem in children, especially in developing countries, short stature is defined as height or length below 3rd per centile for that age and gender, statistically, this indicates that children who are shorter than 97% of their age and gender-matched peers [6, 8]. Children whose height is below the third percentile are known as the lower limit of normal. The expansion of short stature varies worldwide; the highest expansion was reported in Bangladesh it was 73.6% in 1991, Around 2.2 million children under age 18 have heights below the third percentile in the United States, and although most of them are healthy a few of them underling satisfactory for short stature, there are no cases recorded in Australia in1995[2]. A study conducted in Saudi Arabia reported that the prevalence of short stature in children was 11.3% in boys and 10.5% in girls, other survey which conducted in West Bank Palestine to study the expansion of short stature among school children in Ramallah, it was found that 9.2% of boys and 7.3% of girls were had short stature [9]. Short stature has been studied widely around the world but similar studies are quite few in Libya.

Short stature children have complications in their health, they elevated risk of elevating metabolic disease, especially insulin resistance, obesity, carbohydrate intolerance and dyslipidemia [11,16]. Short children reported that they were bullied frequently. Children suffering short in length have also been reported to be correlated with stigmatization and become introversion that can cause chronic psychosocial stress [12]. short stature hurts quality of life in adulthood, growth retardation in childhood is associated with higher disease risk in adulthood, physical work capacity and productivity [13]. Short-stature children have bad and poor eating behaviors like picky eating and partial eating which may affect the levels of uric acid which is associated with many metabolic syndrome, nonalcoholic fatty liver disease, type 2 diabetes, and cardiovascular diseases [14]. Metabolic bone disease is associated with short stature which led to osteoporosis [15].

Causes of short stature can be listed in; Constitutional Growth Delay, Familial short stature, Growth Hormone Deficiency, Primary malnutrition, Celiac diseases, Hypothyroidism, Genetic syndromes, Chronic diseases like; Insulin-dependent diabetes mellitus, Low birth weight, Congenital heart diseases, Thalassemia, bronchial asthma, Rickets Fanconi anaemia, Addison's disease, Epilepsy, and idiopathic short stature [10].

Aimed of this study is to investigate the prevalence of short stature among primary school children in the city of Hun.

Material and methods

This survey study was carried out over 3 months from October to December 2022. At 6 out of 9, primary public schools in the city of Hun are included in this study.

Study samples were chosen to suit the demographic and social distribution of the city, this study included all second-grade students in the targeted schools, aged 8 years.

A total, of 333 children were included in this study 160 boys and 173, girls' permission letters have been obtained from each school.

stature measurements were performed on all healthy children, physical examinations were recorded on a predesigned survey, and height and weight were taken with nurses at the school clinic room, evaluation of the short stature of children will describe in many references [1, 22]in briefly, height measurement of children was taken by using a metal tape measure and ruler, the height of the vertex was take as the child stand up on flat floor without a carpet, barefooted, his/her feet facing the wall, and the back of head, shoulders, buttocks and heels are facing the wall. The child's legs are straight, his/her

arms are at his sides and his/her shoulders are in a flat position, the children were asked to look forward horizontally, and stretch their necks to be as tall as possible. A ruler was placed on the top of the child's head, and the metal tape measurement was placed under his/her heels on the right side of the child, after double-checking of the right position, the height is recorded to the last completed 0.1cm.

Weight measurement, the children were weighed with minimal clothes and barefooted by using the Weight Scale Digital for Humans, 1.0 kg was subtracted to account for their clothes, and the weight was recorded to the last completed 0.1 Kg.

The short stature estimation has been done by using WHO growth charts, the height of all students in each school was compared to the classification of WHO if the height of a child lower than the average normal height defined as short, which was in a boy 118.6cm and girls 118.2 according to WHO. The sum of all short boys and girls was calculated in each school to make a percentage for each.

The weight estimation has been done by using WHO growth charts, the weight of all students in each school was compared with the average normal weight of boys and girls, which was less than 20.45kg for boys and 20kg for girls, The sum of all lower weight boys and girls were calculated in each school to make percentage for each.

Results and discussion

The distribution of the survey study of children at the six primary public schools in the city of Hun is presented in Table (1). In total, 333 students aged 8 years were screened 44 of them were found to have short stature. However, 18 boys and 26 girls had height below the normal average according to WHO growth charts, in percentage of 11.25% for boys, and 15.02% for girls, data shown in Table (2). The sum of children who had a lower weight below the normal average according of WHO is 27 out of 333 children, where of 8 boys, and 19 girls, in the percentage of 5% and 10.98% respectively. Data representing the distribution of the weight of students is shown in Table (3).

Table 1. Distribution of the study sample per school.

SN.	school	n	(%)
1	Abo-baker Alsedeg	47	(14.11%)
2	Al – Markazeya	95	(28.52%)
3	Al-kudes	25	(7.5%)
4	Al-kusear	30	(9.0%)
5	Shohada-Afia	100	(30.0%)
6	Naser-Alzewi	36	(10.8%)
Total	**6**	**333**	**(100%)**

Table 2. The distribution of students is short stature.

School	Boys (n) height less than 118.6	Girls(n) height less than 118.1
Abo-baker Alsedeg	0	0
Al – Markazeya	7	8
Al-kudes	3	-
Al-kusear	1	2
Shohada-Afia	7	15
Naser-Alzewi	-	1
Total	18	26
Percentage %	11.25%	15.02%

*School is just for boys (Al-kudes), School is just for girls (Naser-Alzewi).

Table 3. The distribution of students has Low weight.

school	Boys(n) weigh less than 20.45 kg	Girls (n) weigh less than 20.0 kg
Abo-baker Alsedeg	0	0
Al – Markazeya	2	6
Al-kudes	1	-
Al-kusear	1	0
Shohada-Afia	4	8
Naser-Alzewi	-	5
Total	8	19
Percentage%	5%	10.98%

*School is just for boys (Al-kudes), School is just for girls (Naser-Alzewi)

Short stature has been wildly studied worldwide [6,2, 1], but similar studies are very few in Libya. As previously identified short stature is when the child has a height below the average for age in the WHO growth charts [4]. In this study, a total of, 333 children 44 has short stature. In the current study, an estimation of short stature was just dependent on the height measurements of the tallness of all healthy children. However, this study gives us highlights spots on the prevalence of short stature among children aged 8 years in the city of Hun, that is the causes of SS are not been studied, but in many researches, conducted that the main causes of SS were Constitutional growth Delay, Familial Short stature, Malnutrition, Coeliac disease and Growth Hormone Deficiency [20 ,10]. However, in this research the data were collected from schools in a different background, as mentioned before, data processing revealed that the higher number of students suffering are those at the schools in the Town centre, and the lowest number was found at schools in Outskirts, that is may be because of the lifestyle of the countryside residents [1, 18] as they are exposed to a sufficient amount of sunlight by playing outside, while at (AboBaker-Alsedeg) school of short stature was 0% , that is might be because of genetic factor, also the average weight of children was at normal average weight for age. Although most children with SS are basically healthy, poor weight gain is wildly distributed among children especially those of age primary school, the main cusecs are the nutritional disturbance or chronic disease [20]. In this study, overall, 27 of 333 children had underweight for age, in percentile of 5% for boys, and 11% for girls. This funding's may be through malnutrition for children as previously mentioned, anther causes of low weight is a dental caries, there are relationship between untreated dental caries and weight and height of primary school children as researchers suggested. Untreated caries could affect children's ability to eat also infection from dental caries could have impact on children growth. [21] An estimate of growth demands effective growth measurements with data plotted on suitable growth charts [6].

Conclusion

This survey study revealed the extent prevalence of short stature among primary school children in the city of Hun, Libya, variation from this normal model of growth may be a signal of pathologic conditions, further research is needed to seek the reasons of the prevalence this growth problem among children.

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