

## **Obesity among years 1 and 6 primary school children in Selangor Darul Ehsan**

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### **ABSTRACT**

A study was conducted from March to June 1991 to determine the prevalence of obesity among primary school children in the State of Selangor. One School Health Team in each of the 9 Districts of Selangor participated in the collection of data, the whole project being coordinated by the Selangor State Health Department. A total of 28 rural and 24 urban schools were selected for the study, involving a total of 2,688 pupils in Standard 1 and Standard 6. The prevalence of obesity, using  $>120\%$  of the reference weight-for-height as the criteria, varied considerably in the different districts, with an overall prevalence of 7.8% in the State. The proportion of boys affected (66.7%) was twice that among girls (33.3%). The prevalence of obesity of 9.8% in the urban schools was significantly higher than the 6.1% found for rural schools ( $p<0.0001$ ). 151 (11.1%) were from Standard 6 and 59 (4.4%) were from Standard 1 ( $p<0.0001$ ). It was also found that there was a significantly higher prevalence of obesity amongst primary 6 children ( $p<0.0001$ ). Whilst the problem may not be as serious as that found in developed countries, the findings of this study should serve as an early warning to health authorities of the seriousness of the problem.

### **INTRODUCTION**

Rapid advances in the socioeconomic situation in many countries in Asia, including Malaysia, has resulted in significant changes in the lifestyles of communities. These changes include food habits, food purchasing and consumption patterns. As a result of these changes, there has been a definite change in the food and nutrition issues facing the communities in the country over the past two decades. The population is now faced with the other facet of the malnutrition problem, namely chronic diseases associated with an imbalanced diet, such as obesity, hypertension, coronary heart disease and certain types of cancers (Tee, 1995). Obesity is also a risk factor for other non-communicable diseases and is becoming increasing problems in developing as well as developed countries (WHO, 1990). In a review of a large data set of over 5,623 adult Malaysians in urban and rural areas, Ismail *et al.* (1995) showed that the problem of overweight was about 18%, while another 4% of the subjects were obese.

Childhood overweight and obesity should be of particular concern to health workers for various reasons. The disorder brings about negative repercussions, both physically and psychologically, to children who are excessively overweight. Overweight can lead to higher incidences of adult obesity and non-communicable diseases. Children represent the future resources of countries, and in many countries of the Western-Pacific region, still constitute a relatively large proportion of the population (Darnton-Hill, *et al* 1995). There are less data on the prevalence of obesity, compared to data for adults. In a review of various available data in the region, Darnton-Hill, *et al* (1995) drew attention to the decline in the proportion of undernourished children on the one hand and the increasing evidence that children are getting heavier on average and in higher

proportions. Even in countries such as the Philippines, the number of overweight children has tripled in the last ten years. In Singapore, some 12% of school-age children 6-16 years have been reported to be overweight or obese. The proportion is thought to be much higher in Australia, where some 30% of children are overweight and 5-19% obese.

The objective of this study is to provide data on the severity of obesity amongst Malaysian school children, specifically primary school children in the rapidly industrialized state of Selangor. Only children in primary 1 and primary 6 shall be examined in order to have a more manageable sample size. Children in both rural and urban areas shall be included in the study to enable comparison between these two areas. The data to be obtained will be used to initiate follow-up remedial measures to assist the obese children to overcome their problem.

## **METHODOLOGY**

The project was conducted for 3 months from March to June 1991, covering all the 9 districts in Selangor. Data collection was carried out by the School Health Team of the districts. The study subjects were selected by a multistage sampling method with the following steps:

- (a) 3 primary schools in a rural setting were selected comprising 1 National Primary School (SR Kebangsaan), 1 National Type Chinese Primary School (SRJK Cina) and 1 National Type Tamil Primary School (SRJK Tamil).
- (b) 3 primary schools in an urban setting were also selected, comprising 1 SR Kebangsaan, 1 SRJK Cina and 1 SRJK Tamil.
- (c) 1 class of standard 1 children and 1 class of standard 6 children in each of the above mentioned schools were selected randomly.
- (d) 25 school children were chosen randomly from each class.

A school is considered to be in an urban setting if it is situated within the 20 km radius of the town and rural if it is situated beyond this radius. Total sample size for each district was limited to 300 school children so as not to put too much strain on the School Health Team who has to do routine School Health Services besides collecting data for this study.

Weight of the children was taken using the weighing scales found in the schools. The weighing machines were calibrated before taking measurements. Height was measured using the measuring rod attached to the weighing machine. A checklist of the procedures for taking weight and height measurements was given to the School Health Team for use in the study. Weight-for-height measurements of the children were then compared with the NCHS reference (WHO, 1983). For the purposes of this study, a student is considered obese if his/her weight-for-height is >120% (approximating +25D) of the reference.

## **RESULTS AND DISCUSSION**

The total number of pupils included in the study was 2,688. A total of 1,333 pupils in Standard 1 was studied, making up 2.5% of the total of 53,286 pupils of that grade in Selangor state. For Standard 6 pupils, a total of 1,355 pupils was examined, making up 3.2% of the total of 42,974 pupils of that grade in the state. The number of pupils studied in the 9 districts was approximately similar. The prevalence of obesity in the districts varied considerably, ranging from 2.3% in Sabak Bernam to 11.1% in Hulu Langat (Table 1). The urban districts of Hulu Langat, Petaling and Klang had the highest percentage of obese children (11.1%, 10.7% and 9.3% respectively). The overall prevalence of obesity in the state of Selangor was found to be

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7.8%.

**Table 1.** Prevalence of obesity among primary school children in the nine districts of Selangor

District	Sample size	No. of obese children	Obesity rate (%)
Hulu Selangor	300	17	5.7
Kuala Langat	388	37	9.5
Selangor	150	5	3.3
Sabak Bernam	300	7	2.3
Hulu Langat	350	39	11.1
Kuala Selangor	300	26	8.7
Klang	300	26	8.7
Petaling	300	32	10.7
Gombak	300	19	6.3
All districts	2,688	210	7.8

Out of the total of 210 obese pupils in the study, 48.6% was Chinese, 36.7% Malays and 12.9% Indians. Breakdown of the obese pupils by sex shows that 66.7% of them was boys and 33.3% girls. Further analysis shows that about 78.5% of the obese pupils were from families with monthly income of less than RM 1,000.

The prevalence rate of obesity of 7.8% in Selangor should serve as an early warning signal to health authorities of the seriousness of the problem in our young children. While it is not as high as that reported for Singapore children, it is still high enough to be a cause for concern. In a prevalence study of obesity in Singapore primary school children, Ho et al. (1983) reported a prevalence of obesity of 1.8% in 1976 which increased sharply to 5.33% in 1980. In a later report by the Singapore School Health Services (Ministry of Education, 1988), it was reported that the prevalence of obesity among children in Primary 1, Primary 6 and Secondary 4 combined was 14.4% for boys and 10.6% for girls.

Comparison of prevalence rates between schools in urban and rural settings shows a higher proportion of obesity among school children in urban areas compared to those in the rural areas for all the 9 districts (Table 2). Overall, the prevalence of 9.8% of obesity in the urban schools was significantly higher than the 6.1% found for rural schools ( $p < 0.0001$ ). Urbanisation and increasing affluence appears to be accompanied with an increasing number of obese people.

Table 3 shows the comparison of prevalence rates of obesity between Standard 1 and Standard 6 children. In all the districts, except Kuala Selangor, the prevalence of obesity was higher among Standard 6 pupils than the year 1 children. Overall, there was a significantly higher prevalence rate of obesity in Standard 6 pupils (11.1% versus 4.4%,  $p < 0.0001$ ). This increasing prevalence rate amongst older children is noteworthy and is similar to the Singapore studies. Thus, to assess and control childhood obesity it is necessary to screen school children several times and not just at Standard 1.

Table 2. Prevalence of obesity among urban and rural primary school children in Selangor

District	Urban schools			Rural schools			Significance of difference between urban & rural schools
	No. of schools / students surveyed	No. of obese	% obese pupils	No. of schools / students surveyed	No. of obese	% obese pupils	
Hulu Selangor	3/150	12	8.0	3/150	5	3.3	-
Kuala Langat	3/207	22	10.6	3/181	15	8.3	-
Selangor	-	-	-	3/150	5	3.3	-
Sabak Bernam	3/150	5	3.3	3/150	2	1.3	-
Hulu Langat	3/150	17	11.3	4/200	22	11.0	-
Kuala Selangor	3/150	14	9.3	3/150	12	8.0	-
Klang	3/150	21	14.0	3/150	7	4.7	-
Petaling	3/150	22	14.7	3/150	10	6.7	-
Gombak	3/150	10	6.7	3/150	9	6.0	-
All districts	24/1275	123	9.8	28/1431	87	6.1	Z = 4.74 P<0.0001

Table 3. Prevalence of obesity among standard 1 and standard 6 pupils in Selangor

District	Urban schools			Rural schools			Significance of difference between Std. 1 & Std. 6
	Total no. of pupils surveyed	No. of obese pupils	% obese	Total no. of pupils surveyed	No. of obese pupils	% obese	
Hulu Selangor	150	5	3.3	150	12	8.0	-
Kuala Langat	208	10	4.8	180	27	15.0	-
Selangor	50	1	2.0	100	4	4.0	-
Sabak Bernam	150	-	0	150	7	4.7	-
Hulu Langat	175	9	5.1	175	30	17.1	-
Kuala Selangor	150	13	8.7	150	13	8.7	-
Klang	150	9	6.0	150	19	12.7	-
Petaling	150	10	6.7	150	22	14.7	-
Gombak	150	2	1.3	150	17	11.3	-
All districts	1333	59	4.4	1355	151	11.1	Z = 6.48 P<0.0001

## CONCLUSIONS

This is probably one of the larger studies on obesity among primary school children in Selangor. It should be an impetus for us to conduct similar studies every 3 or 5 years to find out if the pattern of childhood obesity is one of increasing prevalence over the years. It should also fuel our interest to find out if older school children tend to develop obesity as they grow older or not. All these studies will therefore provide basic data which will be of great help for future preventive measures.

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