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Hospital based prevalence of overweight in pediatrics visiting OPD

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Abstract
Aim: The aim was to determine the prevalence of overweight and obesity among 6– year-old children.
Methods: This is a survey of 1774 children from different child care health centres in Patna, Bihar. Body mass index data extracted retrospectively from health records at the age of 6 years was compared with international definitions of over- and underweight. The prevalence figures were further compared with socio-demographic figures on municipality level.
Results: Overall, 19 % of the children were classified as overweight or obese; 5 % were classified as obese. The prevalence of overweight and obesity was higher among girls (22%) than among boys (16%). The prevalence of underweight was 8 % among both girls and boys. Despite large variations in the prevalence of overweight and obesity between municipalities (9-35%), no association was found with municipality figures on socio-demographic factors.
Conclusion: The prevalence of overweight including obesity among 6- year-old children was somewhat higher.

Keywords: Child health care centre, Child obesity, Overweight, Prevalence

1. Introduction
Childhood obesity represents a major risk factor for chronic disease and is associated with social and psychological problems in addition to decreased health related quality of life. Overweight children and adolescents have a high risk of becoming overweight as adults with a higher premature mortality in the future as a possible consequence on the population level.
In order to compare different studies however, standardized measures of socio economic level are needed. Since no association was found by cross tabulation, multilevel analysis was not performed in this study.
The high prevalence rate of childhood obesity may possibly be associated with the lower income and educational level in this region compared with national average. However, because national country wise comparative studies are lacking, we cannot draw any conclusion on this issue.
In the setting of municipality child health care centers, public health nurses collect data on height and weight of virtually all children. This valuable information from the general child population could be made more readily available in order to monitor and explore the epidemiology of childhood obesity. The information could help us to better understand the epidemic, evaluate the effects of former initiatives and address new preventive strategies.
Data on education, employment and income level was made available by Statistics, Facts on municipalities. These variables are used as key socio-demographic indicators on the municipality level. The percentage of adult population with a high (tertiary) educational level was given for each municipality, defined as more than 13 years of education. This corresponds to education at academy, college or university level.

2. Methods
Local public health nurses performed the measurements as a part of routine examinations. Height and weight were measured to the nearest 0.1 cm and 0.1 kg, respectively, with the children wearing light clothing, according to general principles in the routine preventive health program.
Anonymized data on age, sex, height, weight and municipality of residence was extracted retrospectively from local health records by the staff at the child health care centre. BMI was calculated as kg/m² and the children were categorized as normal weight, overweight or obese. Age at last birthday and reference values at midyear were used to classify children as overweight or obese.

3. Results
Height and weight measurements of 1774 1st grade school children (896 girls and 878 boys) with mean age of 6.2 years (SD 0.6) were available for analysis. The mean BMI was 16.2 kg/m2 (SD 2.2) Overall, 19 % (n=331) had a BMI above the cut-off values for overweight including obesity (OWOB) and 5 % (n=91) of the children had a BMI above the cutoff value for obesity (OB). The prevalence of OWOB was 22 % among girls and 16 % among boys. The prevalence of obesity did not differ significantly between girls and boys (5.8 % versus 4.4 %, p= 0.12) A total of 7.8 % (n=138) children were categorized as underweight; no sex differences were found (girls 7.8 % vs boys 7.7 %) (Table 1).
The prevalence of OWOB ranged from 9 % to 35 % in the municipalities (data not shown), and three municipalities had figures above 30 %. No difference in the prevalence of OWOB was seen between Sami and other municipalities, between municipalities defined as urban or rural, or between municipalities with numbers of inhabitants more than 9000 compared with the others. Furthermore we did not observe any variation in the prevalence of obesity associated with the proportion of inhabitants with higher academic educational level, level of employment or mean annual income at the municipality level (Table 2). We found similar results when analyzing each gender separately.

Table 1: The prevalence of underweight, overweight (OWOB) and obesity (OB) among 6- year-old children

Gender	Normal		Underweight*		Overweight (OWOB)*		Obese (OB)*		Total
	n	%	n	%	n	%	n	%	n
Girls	629	70.2	70	7.8	197	22.0$^{\$}$	52	5.8	896
Boys	668	76.1	68	7.7	142	16.2$^{\$}$	39	4.4	878
Total	1297	73.1	138	7.8	339	19.1	91	5.1	1774

Discussion

The findings from this survey showed that the prevalence of overweight was 19 % among 6- year-old children in India and that the occurrence of OWOB was more frequent among girls; 22 % versus 16 % in boys. The prevalence of overweight ranged from 9 % to 35 % in the municipalities and we were not able to identify factors associated with this variation on the population/municipality level.

In this survey 86 % of the children attending 1st grade at primary school met at the child health care centre. Public health nurses involved in this study reported that reasons for non-attendance were non-differential conditions such as illness, family temporarily absent from home, emigration/ immigration etc, and there were no indications of an attendance bias based on socioeconomic status or ethnicity.

The data was collected in connection with routine child health services and no standardized or quality control procedures were performed. Although we cannot exclude the possibility of systematic measurement errors because of unequal routines in the different municipalities, we anticipate such errors to be non-differential, affecting categorization of weight groups equally.

A national representative study conducted among 9–year-old children classified 17 % of girls and 14 % of boys as OWOB according to IOTF cut-off criteria. Two years later, the OWOB prevalence was 22 % among girls and 17 % among boys in a similar national survey.

This study concluded that the results indicated a higher prevalence of overweight and obesity. In our study, the prevalence of overweight and obesity among 1st grade children was slightly higher than the OWOB prevalence of 15 % among 6-year-old children. In our analysis we did not observe any variation in the prevalence of OWOB associated with variation in mean income, proportion of employment and proportion of inhabitants with academic education on the municipality level. These results might be in contrast to a study among 4-year–old children which reported higher prevalence of overweight and obesity in municipalities with low socio-economic level, in particular among girls.

Conclusion

There was a high prevalence of overweight and obesity among 6-year-old children. The prevalence of overweight and obesity was significantly higher in girls compared with boys using the IOTF cut-off criteria. Data from child health care centers are important public health indicators and should be made more easily accessible for publication.

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