

Surveillance of childhood obesity in Sweden

Focus on lifestyles and socioeconomic conditions

Akademisk avhandling

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av

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Avhandlingen baseras på följande delarbeten:

- i. Sjöberg A, Moraeus L, Yngve A, Poortvliet E, Al-Ansari U, Lissner L. Overweight and obesity in a representative sample of schoolchildren – exploring the urban-rural gradient in Sweden. *Obesity Reviews* 2011 May;12(5):305-14.
- ii. Moraeus L, Lissner L, Yngve A, Poortvliet E, Al-Ansari U, Sjöberg A. Multi-level influences on childhood obesity in Sweden: societal factors, parental determinants and child's lifestyle. *International Journal of Obesity (Lond)*. 2012 Jul;36(7):969-76.
- iii. Moraeus L, Lissner L, Sjöberg A. Widening socioeconomic gap in obesity among Swedish girls from 2008 to 2013, despite overall stability in prevalence. In press *Acta Paediatrica* 2014.
- iv. Moraeus L, Lissner L, Olsson L, Sjöberg A. Age and time effects on children's lifestyle and overweight Sweden. In manuscript.

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Background and aim: There is a general lack of childhood obesity surveillance systems throughout Europe, including Sweden. Such systems are needed to develop policies, evaluate interventions and track secular changes in weight status. The general aim of this thesis was to describe the national and regional prevalence of overweight and obesity in Swedish 7-9-year-old children, as the initial step to establish a national childhood obesity surveillance system. Attention was given to socioeconomic factors at individual and area levels. Further aims were to analyze secular trends and longitudinal changes in weight status and lifestyle in a regional sample while considering area socioeconomic status (SES) and individual socioeconomic position (SEP).

Methods: Anthropometric measurements and lifestyle data were collected in 2008, 2010 and 2013. Weight status was classified according to International Obesity Task Force (IOTF), Cole 2007 and the World Health Organization growth standard (WHO). Schools were sampled in order to be representative for Sweden and all measurement methods were standardized. Two studies were based on the 2008 nationally representative sample of 7-9-year-old schoolchildren (n=4538) and investigated the associations between children's weight status and SES, urbanization and parental and child lifestyle variables. In two further studies, cross-sectional (n=3492) and longitudinal (n=678) trends in children's weight status and lifestyle in the region of West Sweden were investigated.

Results: The national prevalence of overweight was 16.6% including 3.0% obese; thinness was observed in 7.5%, according to IOTF/Cole 2007. Overweight was more common in rural areas, partly explained by the lower educational level in those areas. Parental weight status was strongly associated with child overweight and obesity. Overall more favorable lifestyle characteristics were observed in urban areas and for children of highly educated mothers. In West Sweden, trends in weight status between 2008 and 2013 were generally stable except for an increase in thinness in girls. Further, widening of the socioeconomic gap in obesity in girls occurred, due to non-significant decreases in areas with high education and increases in areas with low education. When applying the WHO-reference, prevalence of overweight was higher, due to lower cut-offs, while thinness was almost non-existent. Similar socioeconomic gradients but no trends in weight status were observed according to the WHO-reference.

Conclusion: Since obesity in the parents was the strongest risk factor for excess weight in children, targeting entire families in interventions should be a priority in management of the childhood obesity epidemic. Furthermore, strategies to reduce socioeconomic disparities in obesity are urgently needed. It may prove difficult to identify families at risk, therefore, targeting high risk areas, such as rural areas and areas with low SES, may be more effective. Further, in order to plan and evaluate public health strategies and policies there is a need for surveillance at the national level.

Keywords: surveillance, child, obesity, thinness, urban, rural, socioeconomic status, sedentary, sugar-sweetened beverages, lifestyle, COSI