

Limited availability of childhood overweight and obesity treatment programmes in Danish paediatric departments

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ABSTRACT

INTRODUCTION: The prevalence of children and adolescents with overweight and obesity has tripled over the past 30 years. One in five children in Denmark is overweight, a condition which is accompanied by serious medical and psychosocial complications. So far, an overview of the Danish treatment of childhood overweight and obesity has been lacking.

METHODS: Telephone interviews with all Danish paediatric departments were conducted in 2014. The results, constituting a baseline, were analysed using the clinical guidelines for overweight and obesity published by the Danish Paediatric Society's Overweight Committee in 2015.

RESULTS: About 32% of the 19 departments had multidisciplinary programmes resembling the guideline recommendations. Roughly 37% of the departments offered considerably less comprehensive programmes than proposed by the guidelines, and roughly 32% offered only a general basic consultation. Body mass index was the primary parameter used to decide whether obesity management was indicated, varying from the > 90 to the > 99 percentile for sex and age.

CONCLUSIONS: In Denmark, one third of paediatric departments nearly complied with the national clinical guidelines. Another third of departments offered less comprehensive programmes. The final third offered no multidisciplinary treatment programme for the target group. The criteria for referral to the paediatric departments that offered obesity programmes were heterogeneous.

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Over the past 30 years, the number of overweight and obese Danish children and adolescents has tripled, and childhood obesity is one of the primary health challenges of the 21st century [1, 2].

The prevalence of childhood obesity has levelled off during the past 15 years in the Western world, including in Denmark [1, 3-5]. However, the prevalence of overweight among children and adolescents remains about

20% [1, 5, 6], and 4-5% of children are obese [4, 5].

Moreover, approx. 70-80% of these children and adolescents risk overweight or obesity later in life [1, 3, 6].

Overweight and obese children and adolescents and their families face serious psychological, social and medical consequences arising from their disease [1, 7].

The psychological consequences typically include bullying [7], reduced quality of life, loneliness and depression [6, 8]. The social consequences include a lower educational attainment than could otherwise be expected [8]. Medical complications are frequent, exemplified by prehypertension or hypertension in up to 50%, dyslipidaemia in 28% and steatosis in 35% of the children and adolescents in this population [9-11]. It has been documented that obesity-related complications increase cardiovascular morbidity and mortality, potentially reducing life expectancy [12]. Childhood overweight and obesity is a serious global health threat and the Obesity Committee of the Danish Paediatric Society (DPS-OC) considers obesity a chronic disease in line with the World Health Organization (WHO) and the American and the Canadian Medical Associations [13-16]. Recognition of obesity as a chronic disease in Denmark would offer children and adolescents professional treatment, since Danish healthcare would have to prioritise long-term childhood obesity treatment as a standard, contrary to today where time-limited projects are the rule.

The DPS-OC argues that children and adolescents with overweight and obesity should be referred to paediatric departments [15]. In 2015, the DPS-OC published the Danish clinical guidelines for examination and treatment of this group [15]. These guidelines focus on the efficacy of combining diet, physical activity and behaviour-focused interventions in a family-based setting [15]. The guidelines recommend a multidisciplinary approach with a "chronic care model" based on the best clinical practice inspired by the American expert committee [17] and on the daily practice at the Children's Obesity Clinic at Holbaek Hospital [15].

However, before the guidelines from the DPS-OC were published, no baseline had been established for the examination and treatment of children and adoles-

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cents with overweight and obesity. We therefore found that a cornerstone for solid future research on these patients was conspicuously lacking from the outset.

Hence, the aim of this study was to describe the baseline of programmes and services provided to children and adolescents with overweight and obesity in Danish paediatric departments, notably mapping referral patterns and management in relation to the recently published Danish clinical guidelines [15].

METHODS

In 2014, prior to the publication of the clinical guidelines from the DPS-OC in 2015, all paediatric departments in Denmark were invited to participate in the present study, and all accepted.

Telephone interviews were conducted by the first author (ME) in June 2014 using a questionnaire specifically designed for this study and based on the 2007 report from the American Expert Committee Recommendation regarding prevention, assessment and treatment of children and adolescents with overweight and obesity [17]. The structure of childhood obesity programmes, referral patterns, treatment strategies and registration of treatment results were investigated at the departments offering childhood obesity programmes. The questionnaire comprised background variables such as geographical location, the respondent's own professional background and thematic issues, and also addressed treatment options and outcomes. The clinical guidelines for overweight and obesity, published by the DPS-OC in 2015, were used to analyse the described programmes at the paediatric departments in Denmark. These clinical guidelines included obtaining a medical history, using struc-

tured overweight-sheets, physical examination, paraclinical investigation and management of the entire family, involving diet, activity/exercise, sleep patterns, tobacco and alcohol intake, pharmacotherapy and surgery [15].

The data were classified according to the (non-) availability of a childhood obesity programme. The departments were subsequently divided into three levels – A, B and C – to describe the degree of treatment accordance with the national DPS-OC guideline, as set out in **Table 1**. The three levels were based on the following criteria: Whether the department had a described programme, the contents of such a programme and the professionals involved.

Trial registration: not relevant.

RESULTS

All 19 paediatric departments in Denmark participated in the study. The obese patients, i.e. children and adolescents, were referred by general practitioners in all 19 departments and in four departments health visitors also referred children and adolescents. Rarely, patients would also be referred by others, such as a child psychiatrist, a family therapist or a project worker from a local obesity project. The criteria for treatment availability were heterogeneous, with a BMI variation from the ≥ 90 percentile to the ≥ 99 percentile for the sex and age range. In nine departments, the criteria for being offered treatment was a BMI ≥ 99 percentile for sex and age, or the percentile for sex and age crossing two levels on the BMI curve in one year (**Table 2**). The number of departments offering the different programme levels appears in Table 1.

About 32% (6/19) of the departments offered multidisciplinary programmes resembling those recommended in the national clinical guidelines (Level A); 37% (7/19) offered a considerably less comprehensive programme (Level B); and 32% (6/19) offered general basic consultation only (Level C).

Description of the different programme levels

Level A

Multidisciplinary programme: The programme was a permanent and integrated part of the department's service offering. The following professionals were involved: paediatricians, nurses, dieticians, psychologists and secretaries. Four departments also engaged a social worker, two engaged sports professionals, and in one department physiotherapists were also involved. All departments arranged multidisciplinary meetings to discuss individual patients.

Level B

Considerably less comprehensive programme: In four

 TABLE 1

Treatment programmes for children and adolescents with overweight and obesity at paediatric departments in Denmark.

Treatment programme	Services offered	Paediatric departments, n
Level A Multidisciplinary programmes resembling those recommended in the national guideline	Baseline examination: paediatrician Nutritional counselling: dietician Weight checks: nurse Follow-up consultation(s) Consultation: psychologist (for child/adolescent/parents) Other staff groups involved: social workers, secretaries, sports professionals, physiotherapists	6
Level B Considerably less comprehensive programme	Baseline examination: paediatrician Follow-up consultation: paediatrician or nurse Other staff groups potentially involved: dieticians, psychologists, social workers, secretaries, sports professionals, physiotherapists	7
Level C No available treatment programme	General basic consultation: paediatrician	6

departments, the programme established to treat children and adolescents with overweight or obesity was a permanent and integrated part of the weight-management services offered. An additional three departments had programmes that were project-based and thus temporary. Paediatricians and nurses were professionals used by all departments. Five departments had engaged dietitians in the work; three had psychologists; five had secretaries; and three had social workers. In one department a sports professional was also involved.

Level C

General basic consultation: Six departments offered a general basic consultation.

All 19 departments collaborated with relevant municipal authorities. The cooperative partners were health visitors, general practitioners and dietitians. Other organisations collaborating with the departments included various sports clubs; specific, public-private financed treatment centres; and local projects for children and adolescents with weight issues.

The contents of the childhood obesity programmes are outlined in **Table 3**.

All departments documented the patient's medical history and performed a physical examination. Departments with a childhood obesity programme (levels A and B) had a paediatrician conduct the baseline examination, also discussing previous attempts to lose weight, social life, family medical history, physical activity, screen time, bullying and sleeping habits. Level A did nutritional counselling with a dietitian; weight checks and follow-up visits with nurses and dietitians; an opportunity to consult a psychologist. Level B offered follow-up consultations and the programme contents was influenced by the combination of health professionals working in the teams.

All departments offering level A and B treatment programmes stated the importance of involving the entire family in the treatment programme, regardless of the family's structure.

DISCUSSION

This study presents a status of childhood overweight and obesity programmes at Danish paediatric departments as per June 2014. Conducted prior to the publication of the Danish national clinical guidelines under the auspices of DPS-OC, the study provides a baseline for implementation of national treatment programmes built on DPS-OC's recommended guidelines.

Our study showed that 32% of Danish departments offered a multidisciplinary programme for childhood obesity that nearly complied with the national guideline. About 37% of departments offered less comprehensive programmes, often due to a lack of dietitians, psycholo-

TABLE 2

Criteria for referral	Paediatric departments, n	Criteria for referring children and adolescents with weight problems to treatment at paediatric departments with level A and B programmes in Denmark.
BMI > 90 percentile for sex and age	2	
BMI > 97 percentile for sex and age	1	
BMI > 99 percentile for sex and age, or the percentile for sex and age crossing 2 levels on the BMI curve in 1 year	9	
A standard deviation of > +2.7 for BMI for sex and age, or a pre-diabetic phenotype	1	

TABLE 3

Content of level A and B programmes for overweight and obesity at paediatric departments in Denmark.

Content	Items	Paediatric departments, n	
		with level A	with level B
Medical history	Previous attempt(s) to lose weight	6	7
	Data on social life	6	7
	Family medical history	6	7
	Level of physical activity	6	7
	Screen time	6	7
	Data on bullying	6	7
	Sleeping habits, family structure and dynamics, meal and eating habits, description of meals/diet	6	6
	Examination	Data on weight, height and blood pressure Blood tests	6
Treatment strategy	Setting goals for weight loss	6	6
	Family involvement	6	7
	Follow-up consultations with weight checks	6	5
	Nutritional counselling: dietitian	6	4
	Consultation: psychologist, for child/adolescent/parents	6	3
	Sports planning in collaboration with municipal authority	1	1
	Physiotherapy at the department	1	0
Tools/instructions	Own protocol	2	3
	The "Holbaek protocol" [18]	3	2
	Modified version of the "Holbaek protocol" [17]	1	1
	No protocol	0	1

gists and social workers in the multidisciplinary team. Finally, 32% of departments lacked a treatment programme. However, paediatricians in these six departments did inform children and their families about health risks and consequences, subsequently referring them to a dietitian, general practitioner, municipal intervention, a special facility for children and adolescents with weight problems or another department offering a more specific programme for this group.

Our study showed that the criteria for referral were either a BMI \geq 90 or a BMI \geq 99 percentile for sex and age, or the percentile for sex and age crossing two levels on the BMI curve in one year. Furthermore, we found varying definitions of overweight and obesity. Some de-

 TABLE 4

Danish clinical guidelines for examination and treatment of overweight and obese children and adolescents in a paediatric setting [15].

BMI corresponding to an isoBMI of at least 30 or
BMI corresponding to an isoBMI of 25-30 and ≥ 1 of the following features (potential for complex obesity):
Suspicion of a specific medical reason for obesity
Dyscrine features
Declining rate of growth: height, i.e. a relatively short stature
Developmental delay
Persistent overeating/"binge-eating" and searching for food
Rapidly increasing BMI
Other complications/associated conditions, e.g. hypertension, dyslipidaemia, elevated concentrations of liver enzymes, insulin resistance, prediabetes, Type 2 diabetes, polycystic ovary syndrome or obstructive sleep apnoea
Concurrent family history of ≥ 2 of the following diagnoses:
Type 2 diabetes, hypertension, hyperlipidaemia, metabolic syndrome, cardiovascular disease or obesity

partments used, for instance, BMI as a percentage, in relation to age and gender, whereas others applied the International Obesity Task Force, Standard Deviation Score (SDS) or Z-score [1]. The DPS-OC guidelines for overweight and obesity recommend a more differentiated reference pattern, as described in **Table 4**.

Meanwhile, the results also illustrate considerable differences in the strategy and contents of the treatment programmes. The range of health professionals included reflects the different treatment items offered and the screening tools applied for the child or youth in question.

The study participants from all paediatric departments with a childhood obesity programme (level A and B) stressed the importance of involving the whole family, regardless of family structure. They did not, however, suggest operational examples of family involvement. This indicates a need for more detailed attention to efforts and tools aimed at involving families in weight management for children and adolescents. Several studies have shown that family involvement is important for successful weight loss [17, 19]. Also, from society's point of view, it is more inexpensive to treat children and parents together as this increases the number of treated patients, given that weight problems often run in the family [20].

Like the Danish national guidelines [15], international studies based on the American Expert Committee [17] have also documented results for weight loss. A Danish study showed that 76% of the participating children reduced the severity of their obesity after one year, and 57% after two years of treatment. The mean BMI SDS difference showed -0.30 BMI in boys and -0.19 BMI in girls after one year, and -0.40 BMI in boys and -0.24 BMI in girls after two years [19].

Boy with severe obesity.



Overweight and obesity has not yet been recognised as a chronic disease in European countries, even though the WHO now defines overweight and obesity issues as a global epidemic and a huge public-health problem [21], having declared overweight and obesity a chronic disease as early as 1979. The American Medical Association stated the same in 2013, as did the Canadian Medical Association in 2015 [2, 13, 14, 16]. The DPS-OC recommends recognising obesity as a chronic disease, because of the condition's serious psychological, social and medical consequences [2, 15], which should be addressed through a professional standard service offering for children and youth.

We suggest that this study be repeated in a few years to determine how the 2015 DPS-OC guidelines have been implemented, thereby helping to ensure uniform treatment programmes across Denmark for children and adolescents with identified weight problems.

Study limitations

The telephone interviews included answers from a variety of professionals, which may have caused some heterogeneity in responses. Furthermore, recall bias may have been present, and the data were self-reported.

Study strengths

The telephone response rate was 100%, which means that all paediatric departments in Denmark participated in the study. Furthermore, the same researcher conducted all of the telephone interviews to achieve homogeneity.

CONCLUSIONS

This study examined the availability and contents of

treatment programmes for children and adolescents with overweight and obesity as offered by paediatric departments at Danish hospitals in June 2014.

The criteria for treatment availability were heterogeneous. The baseline, established before the new national clinical guidelines for treating this group were implemented in Danish paediatric departments, showed that one third of departments already largely complied with new guidelines by offering multidisciplinary programmes. About another one third of departments offered less comprehensive programmes, often due to a lack of dietitians, psychologists and social workers in their multidisciplinary teams. The final third of departments had no treatment programmes in place for this patient group.

We recommend full and continued implementation of the national clinical guidelines for overweight and obesity, ensuring access to uniform treatment programmes and health-service quality throughout Denmark.

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LITERATURE

1. Svendsen M, Brixval CS, Holstein BE. Vægtstatus i første leveår og overvægt i indskolingsalderen: Statens Institut for Folkesundhed, 2013.
2. Farpour-Lambert NJ, Baker JL, Hassapidou M, et al. Childhood obesity is a chronic disease demanding specific health care – a position statement from the Childhood Obesity Task Force (COTF) of the European Association for the Study of Obesity (EASO). *Obes Facts* 2015;8:342-9.
3. Larsen LM, Hertel NT, Mølgaard C et al. Prevalence of overweight and obesity in Danish preschool children over a 10-year period: a study of two birth cohorts in general practice. *Acta Paediatrica* 2011;101:201-7.
4. Pearson S, Hansen B, Sørensen TI et al. Overweight and obesity trends in Copenhagen schoolchildren from 2002 to 2007. *Acta Paediatr* 2010;99:1675-8.
5. Schmidt Morgen C, Rokholm B, Sjöberg Brixval C et al. Trends in prevalence of overweight and obesity in danish infants, children and adolescents – are we still on a plateau? *PLoS One* 2013;8:e69860.
6. Opsporing af overvægt og tidlig indsats for børn og unge i skolealderen. Sundhedsstyrelsen, 2014.
7. Vamosi M, Heitmann BL, Thinggaard M et al. Being bullied during childhood and the risk of obesity in adulthood: a co-twin control study. *Health* 2012;4:1537-45.
8. Grønbaek HN, Holm JC. Psykologiske konsekvenser af svær overvægt hos teenagere. *Ugeskr Læger* 2011;173:1785-91.
9. Holm JC, Gamborg M, Neland M et al. Longitudinal changes in blood pressure during weight loss and regain of weight in obese boys and girls. *J Hypertens* 2012;30:368-74.
10. Fonvig CE, Chabanova E, Andersson EA et al. 1H-MRS measured ectopic fat in liver and muscle in Danish lean and obese children and adolescents. *PLoS One* 2015;10:e0135018.
11. Nielsen TR, Gamborg M, Fonvig CE et al. Changes in lipidemia during chronic care treatment of childhood obesity. *Child Obes* 2012;8:533-41.
12. Baker JL, Olsen LW, Sørensen TI. Childhood body-mass index and the risk of coronary heart disease in adulthood. *N Engl J Med* 2007;357:2329-37.
13. American Medical Association House of Delegates. Recognition of obesity as a disease. Resolution 420 (A-13). 2013. www.npr.org/documents/2013/jun/ama-resolution-obesity.pdf.
14. James WP. WHO recognition of the global obesity epidemic. *Int J Obes (Lond)* 2008;32(suppl 7):S120-S126.
15. Johansen A, Holm JC, Pearson S et al. Danish clinical guidelines for examination and treatment of overweight and obese children and adolescents in a pediatric setting. *Dan Med J* 2015;62(5):C5024.
16. Rich P. CMA recognizes obesity as a disease. www.cma.ca/En/Pages/cma-recognizes-obesity-as-a-disease.aspx2015.
17. Barlow SE. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report. *Pediatrics* 2007;120(suppl 4):S164-S192.
18. Holm JC, Gamborg M, Bille DS et al. Chronic care treatment of obese children and adolescents. *Int J Pediatr Obes* 2011;6:188-96.
19. Most S, Højgaard B, Teilmann G et al. Adoption of the children's obesity clinic's treatment (TCOCT) protocol into another Danish pediatric obesity treatment clinic. *BMC Pediatrics* 2015;15:13.
20. Epstein LH, Paluch RA, Wrotniak BH et al. Cost-effectiveness of family-based group treatment for child and parental obesity. *Child Obes* 2014;10:114-21.
21. WHO. Childhood overweight and obesity on the rise. www.who.int/dietphysicalactivity/childhood/en/2015.