Abstract

Background and aim The childhood obesity epidemic seems to be levelling out but groups with low socio-economic status (SES) remain disadvantaged in this context. Successful community–based prevention should be targeted and adopt a health promotion approach. To reach and maintain a healthy weight, children at risk for overweight and obesity (OW) need skills to understand the meaning of information and messages related to energy balance. The general aim of this thesis is to explore the prerequisites for prevention of childhood obesity, focusing on areas with low SES and many immigrants and refugees. Specific aims are: (i) to explore dietary patterns, physical activity (PA), perceived relationships between lifestyle and health and OW prevalence among children in areas with different SES; (ii) to assess secular trends in these variables among children in a low-SES community and (iii) to investigate school nurses' counselling of OW pupils in multilingual settings.

Methods Surveys were conducted in January 2003 and 2008. A school in a residential area with low SES and many refugees was surveyed at both times. A school in an area with high SES was surveyed in 2008 only. All pupils in the fifth and sixth grades (n=347) were invited to participate. The surveys consisted of a questionnaire and interview covering habitual dietary pattern, PA and belief in ability to affect health; weight and height were also measured. Comparisons were made between the high- and low- SES school (2008) and, for the school in the area with low SES, between 2008 and 2003.

To investigate current practice in school nurses' supportive work, theme-oriented discourse analysis and qualitative content analysis were undertaken, based on 22 audio recordings from eight school nurses' counselling sessions with 20 OW children. The quantitative distribution of the discourse space was analysed statistically.

Results In 2003, 31% of the children were OW. About half of the children thought they could benefit from a healthy lifestyle at this time. Many children reported a high intake of sugar-rich products. In 2008, compared to 2003, significantly more children in the same low-SES school believed that their lifestyle could affect their health. Furthermore, a downward shift in BMI z-score and decreased intake of sugar were only significant for girls and the prevalence of obesity had decreased non-significantly in both genders. In the high-SES school, the corresponding prevalence in 2008 was significantly lower. Numerous lifestyle habits differed between the schools, all in favour of the high-SES school.

Qualitative analyses suggested that misunderstandings in school nurses' counselling with OW pupils originated from their belief that they knew what advice the pupils needed, insensitivity to the pupils' concerns and poor linguistic comprehension. Nurses occasionally provided inadequate/inappropriate explanations about food and exercise. Inadequate skills in managing the process of enabling children and their parents were observed. Counselling families with languages and food cultures differing from the traditional Swedish ones met with additional difficulties.

Conclusions Differences in obesity prevalence and many lifestyle parameters between children living in areas with varying SES may partly be regarded as a consequence of a society that fails to meet the needs of some of its inhabitants. The studies in this thesis suggest that preventive interventions should be developed and implemented in cooperation with the targeted groups. Measures should be taken to ensure that interpreters are available when needed. To enhance person-centred counselling, school nurses need improved nutritional

knowledge and communication skills. To accomplish this, they should be provided with opportunities to cooperate with other professions.

Keywords: BMI z-score, childhood obesity, counselling, dietary pattern, health belief, migration, physical activity, school nurses, socio-economic status, prevention

Sammanfattning på svenska

Bakgrund och syfte Barnfetmaepidemin verkar mattas av, men barn från grupper med låg socioekonomisk status är fortfarande de som drabbas mest. Samhällsbaserade förebyggande interventioner bör ha en brett hälsofrämjande infallsvinkel och skräddarsys för den målgrupp det gäller. Barn med ärftlighet för övervikt och fetma (OW) behöver färdigheter som hjälper dem att tolka innebörden av information och budskap på området.

Det övergripande syftet med avhandlingen är att undersöka förutsättningarna för prevention av barnfetma med fokus på områden med låg socioekonomisk status (SES) där det bor många invandrare och flyktingar. Delsyften är att undersöka (i) kostmönster, fysisk aktivitet, uppfattningar om samband mellan livsstil och hälsa och förekomst av OW i områden med olika SES, (ii) förändringar över tid i dessa variabler i ett område med låg SES och (iii) skolsköterskors rådgivning till elever med OW i flerspråkiga miljöer.

Metoder Kartläggningsstudier genomfördes i januari månad 2003 respektive 2008. En skola i ett bostadsområde med låg SES och många flyktingar studerades vid båda tillfällena medan en skola i ett område med hög SES studerades endast 2008. Alla elever i 5:e och 6:e klass på de båda skolorna inbjöds att delta. Studierna genomfördes med hjälp av ett frågeformulär och en intervju om matvanor, fysisk aktivitet och frågor om tilltron till förmågan att kunna påverka sin hälsa. Vikt och längd mättes. Jämförelser gjordes mellan skolorna i områden med hög respektive låg SES samt, för skolan i området med låg SES, även mellan resultaten för 2003 och 2008. För att undersöka vilka metoder skolsköterskorna använde för att stödja eleverna analyserades inspelningar från 22 samtal mellan 8 skolsköterskor och 20 elever, med hjälp av temaorienterad diskursanalys och kvalitativ innehållsanalys. Den kvantitativa distributionen av samtalsutrymmet analyserades med statistiska metoder.

Resultat År 2003 hade 31 % av barnen övervikt eller fetma. Ungefär hälften av barnen trodde att de hade något att vinna på hälsosamma vanor. Många barn rapporterade ett stort intag av livsmedel med högt sockerinnehåll. Mellan 2003 och 2008 var det en signifikant ökning av antal barn som trodde att de skulle kunna påverka sin hälsa. För gruppen flickor sänktes BMI z-score signifikant, liksom intaget av socker, medan båda könen uppvisade en icke-signifikant minskning av förekomsten av fetma. I skolan i området med hög SES var förekomsten av fetma signifikant lägre. Ett stort antal levnadsvanor skiljde sig åt mellan barnen i de olika skolorna, samtliga till fördel för barnen i skolan i området med hög SES.

Enligt de kvalitativa analyserna härrörde missförstånden i samtalen mellan skolsköterskor och OW elever från tre olika problemområden; skolsköterskornas uppfattning att de visste från början vilka råd som behövdes, alltför liten benägenhet från sköterskorna att belysa de frågeställningar som elever och föräldrar tog upp samt bristande språklig förståelse. Det förekom otillräckliga förklaringar om mat, motion och energibalans. Vi observerade också bristande förmåga att stödja barnen och deras föräldrar i mobiliserandet av egna resurser för att hantera viktproblemet. Rådgivning till familjer med annat språk och annan matkultur än den traditionellt svenska stötte på ytterligare svårigheter.

Slutsatser Skillnaderna i prevalens av barnfetma mellan grupper med hög och låg socioekonomisk status kan delvis bero på att samhället misslyckas med att tillgodose behoven hos en del av sina invånare. Resultaten av föreliggande studier tyder på att interventioner för förebyggande av barnfetma bör utvecklas och implementeras i tätt samarbete med målgrupperna. Åtgärder bör vidtas för att i största möjliga utsträckning tillgodose behovet av

tolk. För att kunna genomföra personcentrerad rådgivning bör skolsköterskor få fortlöpande möjligheter att utveckla sin evidensbaserade kunskap samt att konsultera och samarbeta med andra professioner.

Original papers

I Magnusson MB, Kjellgren KI, Hulthén L
Obesity, dietary pattern and physical activity among children in a suburb with a high proportion of immigrants
Journal of Human Nutrition and Dietetics 2005 (18) 187-194

II Magnusson MB, Sjöberg A, Kjellgren KI, Lissner L
Childhood obesity and prevention in different socio-economic contexts
Submitted to PLoS ONE, 30 september 2010. Under revision.

III Magnusson MB, Hulthén L, Kjellgren KI
Misunderstandings in multilingual counselling settings involving school nurses and obese/overweight pupils
Communication and Medicine 2009, 6 (2) 153-164

IV Magnusson MB, Kjellgren KI, Winkvist A
Enabling overweight children to improve their food and exercise habits – school nurses counselling in multilingual settings
Submitted to Journal of Advanced Nursing, 13 september 2010

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Content

Abbreviations

BMI	Body mass index
FFQ	Food Frequency Questionnaire
HEI	Health Equilibrium Initiative
IOTF	International Obesity Task Force
OW	Overweight + obesity
PA	Physical activity
SCT	Social Cognitive Theory
SD	Standard deviation
SES	Socio-economic status
SNR	Swedish Nutrition Recommendations
TODA	Theme-oriented discourse analysis
WHO	World Health Organization

Definitions

Culture	Culture can be construed as the living framework of individuals and their collectives – a learned/learning experience, a process of evolving, living, learning, adapting, orienting, thinking, communicating, producing knowledge – within which every individual and social groups operate [1].
Ethnicity	Aspects of relationships between groups which consider themselves, and are regarded by others, as being culturally distinctive [2].

Background

Childhood obesity

Definitions

Childhood is commonly defined as the period between birth and 18 years of age. Obesity has been described by the World Health Organization (WHO) as excessive or abnormal fat accumulation in adipose tissue, to the extent that health may be impaired [3]. The concepts *childhood* and *obesity* have not as yet been successfully combined to yield a common global definition of childhood obesity.

How should fat in adipose tissue best be measured or assessed, and how should the point at which the amount is detrimental to health - taking age, gender, developmental stage, physical build and heredity into account - be determined? There are several options for calculation, including waist measurement, bioimpedance, skin fold thickness and body mass index (BMI).

BMI is calculated by dividing weight with height squared. In the case of children, it has several serious limitations, including low sensitivity, substantial variations with age and not reflecting either the amount of fat vs lean mass or fat distribution. Nevertheless, BMI is commonly regarded as the simplest and easiest measure of overweight/obesity, especially on the population level [4].

Setting cut-off points for overweight and obesity is complicated by the fact that obesity-related disease, albeit often originating in childhood, usually does not manifest until adulthood. Another problem is to define a globally applicable reference population. Different definitions of childhood obesity occur in scientific as well as in clinical practice. WHO has developed growths standards for children using the cut-off points +1SD for overweight and +2SD for obesity [5]. In the US, overweight and obesity are defined as the >85th and >95th percentile, respectively, on the BMI chart of the Center for Disease Control [6]. The International Obesity Task Force (IOTF) defines overweight and obesity in adults as BMI 25 kg/m^2 – 29, 9 kg/m^2 and >29, 9 kg/m^2, respectively. The Swedish health care system, including that in schools, currently uses the IOTF definition, which relates the definitions for childhood overweight and obesity to the definition for adults, basing them on gender-specific curves which intersect the 25 kg/m^2 and the 30 kg/m^2 levels, respectively, at age 18 [7].

Cut-off points for adult obesity differ in different regions of the world, due to diversities in risk profiles for ethnic groups. However, mixed adolescent populations in Europe may be assessed using the common BMI definition of obesity [8]. In this thesis, overweight and obesity are referred to as OW.

Causes and consequences

Childhood overweight and obesity have increased worldwide during the last 30 years. The aetiology can generally be described as an imbalance between energy intake and energy output [9], in combination with genetic predisposition [10]. Fetal growth seems to have a complex association with obesity, with both excessive and restricted weight gain as risk factors [11]. Energy intake is affected by frequency of eating, portion size and energy density of foods, all of which are affected by sensory, psychological and cultural factors as well as access to food [12]. Patterns of physical activity (PA) depend on family habits, time and personal interest, as well as access to playgrounds, space and sports facilities [13, 14].

Parental feeding style [15], stress [16-18], sleep deprivation [19], self-esteem [20], body perception [21], media literacy [22] and advertisements [23] are all strongly suggested to be co-players. Role models such as parents [24] and peers [25] are also important.

Obesity has a number of lifelong detrimental effects on children's health, which may continue into and throughout adulthood [26]. Once acquired, obesity is difficult to treat and prevention of childhood obesity has thus emerged as an important aspect of health promotion in developed and developing countries [27]. Obese children and adolescents are at elevated risk of the metabolic syndrome [28], diabetes mellitus type 2 [29], hypertension [30] liver steatosis [31], polycystic ovarian syndrome [32], sleep-related breathing disorders, [33] and, for girls, asthma [34]. Obese children may suffer decreased quality of life, related not only to weight but also to the social context [35, 36].

The main burden of the childhood obesity epidemic has shifted from population strata with high SES to those with low SES [37-41] and there is an overrepresentation of OW in some ethnic subgroups [42]. Global comparisons between prevalence in urban and rural areas are inconsistent; however, OW is more prevalent in rural areas in Sweden [43].

Analyses of interplay between SES, ethnicity and acculturation are complicated. Heterogeneity in background factors (such as health equity between and within countries and individuals' reasons for migration), large number of non-participants [44] and instruments not validated for all researched groups contribute to obscuring relationships and causalities. Suggested mediators of OW, relevant in the Swedish context, are presented in Table 1.

Table 1 Selected environmental and lifestyle factors, contributing to the varying prevalence of OW in groups with different SES and ethnicity

Low income	• High energy density of cheap food [45]. • Reduced physical activity in unsafe low income environment [46, 47]. • Parents perceiving PA as "work", thus seeking sedentary rest and relaxation when possible [48]. • Shortage of money limits access to sports facilities and clubs which may contribute to less exercise in low-SES youth [49]. • Increased stress in low-SES children [50]. • In settings of food insecurity there might be a perception that OW is healthy [51]. • High value put on certain energy-dense food, because of aspiration to what is perceived as foods that people should be able to afford and enjoy [52].
Low education	• There are indications of lower trusts in scientific experts in low-income and low educated people [53, 54]. An hypothesised link to OW is that individuals who distrust scientifically based advice are more likely to be vulnerable to messages concerning dieting and "quick fixes", shown to increase the risk of future obesity in adolescents [55]. • Parents with higher education can be hypothesized to be more skilled in critical thinking, which is protective against food advertisement that frequently encourages consumption of "junk food" [56] and also against underlying messages in popular films, frequently portraying energy-dense foods in a positive way [57]. • Lack of recognition of "lay knowledge" in nutrition education programmes makes the scientific knowledge that is offered less accessible for people without higher education [58]. • Former starvation may lead to a tendency to "feast" whenever food is available. If access to energy-dense food like fat and sugars have previously been low, such food may have high status when available [48, 59]. • Parents food deprivation in childhood may lead to over-eating in adulthood, which may be transferred to the next generation [60].
Ethnic subgroups	• Dietary acculturation often includes increase of energy-dense food [61, 62]. • Being discriminated leads to stress [48] .

Ethnicity is not a distinct analytical entity. It is constructed from variable elements such as language, diet, religion, values and norms [63]. Structural discrimination on the grounds of ethnicity is common in Sweden, as described in a government report [64]. The author recommends that society shift its focus from the discriminated party to "those with the power to discriminate, or the power to hinder discrimination" (p 50). The International Committee of Medical Journals advises against incautious use of the concept of ethnicity by stating, "When

authors use such variables as race or ethnicity, they should define how they measured these variables and justify their relevance." [65].

Data suggest a levelling out of the childhood obesity epidemic, for reasons that are not fully understood, but related in various ways to SES, ethnicity and gender [42, 66, 67] . While recent nationally representative studies from the US show increasing disparities in the levels of OW in different ethnic and SES groups between 2003 and 2007 [68], tendencies for the epidemic to level off in certain groups (i.e. girls and children with high SES) have been registered, for example in the US [69], the Netherlands [42], Switzerland [70] and Sweden [67]. In the case of Australia, an extensive review of national trends in 1985-2008 (not analyzing SES data) conclude that the prevalence curves seem to have flattened [71], while another Australian analysis, of a smaller national sample for a shorter period of time, shows a significant increase in obesity in children in low-SES schools between 2000 and 2006 [72]. A report from Copenhagen – without data on SES or ethnicity - showed a decrease in younger children but an increase in adolescents [73]. In a nationally representative Finnish sample of adolescents, no SES differences in trends over time were found [74].

Worldwide, societies are becoming increasingly "obesogenic", i.e. facilitating increased food intake and decreased PA [75, 76] and health-promoting work must deal with nutritional conditions to which we are not evolutionally adapted [51]. Further complicating the picture, popular media communicate contradictory messages to young people about food, exercise and health. While idealizing thinness and proclaiming a lean body to be the positive norm [77, 78], popular media currently promote obesity by sending confusing nutritional messages [57, 79-81]. The interplay of the obesogenic society and smokescreens laid out by the media has resulted in a scenario in which children with a genetic predisposition for obesity need an array of resources to keep a healthy body weight.

Prevention

Community-based prevention

Effective prevention of childhood obesity should involve whole communities, including decisions about infrastructure and supply in local food stores, as well as types of food and drink offered in school canteens and access to PA options [27]. Focusing on healthy food, pleasant PA and health and well-being in a broad sense when planning interventions against childhood obesity diminishes the risk of teasing and adverse dieting behaviour [82, 83].

Parents tend to downplay their children's obesity [84]. This is probably more common in groups with experience of food scarcity and, if so, potentially adds to the inverse SES gradient [48, 53]. Offering children possibilities to optimize their general health might be a more appealing approach. Another good reason to focus on healthy food and exercise habits is that healthy food and PA not only yield many health benefits of great importance for individuals with heredity for obesity. Implementing policy strategies for generally healthier communities may well be the most cost-effective way to tackle the problem.

If health promotion interventions do not take active measures to actually narrow the health gap, they are likely to widen it [27], as illustrated by the Kiel Obesity Prevention Study which possibly caused a steeper SES gradient in overweight [44]. Romp and Chomp [85] in Australia; Ensemble, prévenons l'obesité des enfants (EPODE) in France [86], the Healthy

Living Cambridge Kids (HLCK) [87], Coordinated Approach to Child Health (CATCH) [88] and Shape Up Somerville [89] in the USA are examples of published promising community-based interventions for obesity prevention in children. They all targeted the community, school, family and individual levels. Romp and Chomp explicitly included community capacity building, while HLCK and CATCH used Community-Based Principles Research with community members involved in all aspects of the research process. Shape Up Somerville was based on Social Cognitive Theory (SCT).

School-based interventions

Primary prevention of childhood obesity includes the Health-Promoting Schools concept, a prominent component in the WHO's [90] and the European Union's [91] child health policies. It is a framework for successful school health promotion that encompasses enabling all members of the school community to work together to provide social and physical environments that are safe and enhance health.

A number of school-based interventions to prevent obesity have been conducted [88, 92-94], with mixed results [95-97]. In the STOPP-project in Stockholm, children with parents of low SES seemed to benefit more from the intervention, regarding their eating habits, compared to those of high SES (SES measured by parents level of education) [93].

School nurses' role

Children with heredity for OW need knowledge to be able to make meaning of information and other messages. The primary source of this skill-building is the family. In the school context, school nurses are considered to be key in addressing lifestyle problems [98], including OW [99]. Swedish's school nurses' main role in counteracting obesity is to promote generally healthy habits for all children, i.e. primary prevention. Their function also includes secondary prevention, i.e. supporting children at risk for obesity in stemming their weight increase.

Measuring weight and height and calculating BMI is necessary in order to identify OW. In Swedish school health care, this screening is routinely conducted by the nurse in all children in grades 1, 4 and 7 as a part of the health protocol, which also includes a health dialogue [100]. This is an important tool not only for early detection of OW but also for monitoring general health.

School nurses often lack both local guidelines and leadership in their work [101-103] and there is a pronounced need for more evidence-based methods in general [102, 104]. This deficit is also evident in the area of individual secondary prevention of obesity [105] and there are no guidelines regarding OW children with food cultures and language that differ from the majority population. There is a scarcity of data on whether children from low-SES conditions, i.e. representing groups with a higher prevalence of childhood obesity, receive optimal support from the school health care organization.

Making meaning, i.e. "…connecting new information with prior knowledge, affected by one's intention, motivation and strategies" [106] and "a warm and kind style of interaction" [107], are necessary but not sufficient ingredients in successful promotion of lifestyle changes. Additional pivotal factors are included in the concept of person-centeredness, i.e. mutual respect and understanding, development of therapeutic relationships and respect for the rights, values and beliefs of individuals [108].

Accurate knowledge about phenomena related to energy balance and tools to make meaning of this knowledge are fundamental in enabling the child to construct her or his agenda for managing the obesogenic environment. There are several different methods that school nurses can use to convey suck knowledge. Unfortunately, no consistent evidence exists as to which of them might be most efficient. In a recent review, Motivational Interviewing [109], increasingly used in many settings to support OW children to reach and maintain a healthy weight, and Cognitive Behavioural Therapy were found to be potentially effective in nutrition counselling [110].

Building on patient-provider communication theories, Street and Epstein [111] propose a model of pathways linking clinician-patient communication to health outcomes. Applied to counselling between school nurses and children, key functions include cultivating the nurse-child relationship, exchanging and managing information, validating and responding to emotions, managing uncertainty, making decisions and enabling self-management in children and families.

Medical culture and cultural competence

Ideally, counselling represents a meeting between equally valued systems of knowledge, beliefs and practices, yielding agreement on measures to be taken [112]. However, this desirable situation is often distorted by patterns inherent in the medical culture [113], typically understanding itself as not being a culture at all, but rather "timeless truths" [114]. This makes for an unequal relationship between the health care provider and the client, for example the school nurse and the child.

A weakness in many contexts of health promotion, prevention and treatment is provision of care appropriate for individuals or groups from cultures other than the majority culture. The widely used concept of "cultural competency", which may be defined as "the ability to serve multicultural populations" [115], is claimed to be an important building block to provide care on equal terms. The concept is under debate, having been criticized for "effectively denying the changing, multifarious, integrated and interactional nature of identity" [116] and for generating attention to cultural differences which can be interpreted by patients as intrusive and may "contribute to a sense of being singled out and stigmatized" [117].

Kumagai and Lypson [113], discussing cultural competency in relation to medical culture, argue that effective health care work in different settings is achieved not by learning certain skills, but rather by developing a critical consciousness with social justice as the desired outcome. In order to deliver high-quality medical care to "*all* members of society, regardless of gender, race, ethnicity, religion, sexual orientation, language, geographic origin, or socioeconomic background" (p782), health care providers should master "stepping back to understand one's own assumptions, biases and values, and a shifting of one's gaze from self to others and conditions of injustice in the world" (p 783). Interpreted thus, methods for achieving culturally competent care are closely related to the principles behind person-centeredness.

Stigmatizing of childhood obesity

Stigmatizing of childhood obesity may impair or even prevent counselling. The sensitivity of the issue sometimes stops school nurses from raising the health aspects of OW in children

with their parents [118, 119]. Inasmuch as this reluctance is induced by a fear of adverse affects on eating behaviour, it is likely to be unmotivated, at least if professional support is offered. Treatment for obesity does not initiate eating disorders in children and adolescents but dieting, i.e. belief in "quick fixes", may do so [82, 120, 121].

The social construction – i.e. the ordinary or conventional point of view - of obesity is currently characterized by "civilized oppression" [122], "stigma" and "as important a problem as racial discrimination" [83]. Children's negative attitudes towards overweight peers typically develop in preschool years, increase in elementary school and persist in adolescence. The problems seem to be equivalent among different ethnic groups. OW children are also sometimes discriminated against and teased by their educators and parents [83]. In Sweden, prejudice against obesity has been documented among 10-year-olds, more prevalent in high-SES groups [123]. Health care professionals affected by the societal stance on obesity may display an adverse attitude towards obese adults [124, 125].

In Sweden, childhood obesity is more prevalent in areas where the population has a low SES and non-Swedish ethnicity. The reasons for this are not fully understood. Since general health promotion efforts tend to increase the health gap between different strata in the population, there is a need for methods to develop targeted interventions. There is limited knowledge of how school nurses use their potential to support children with other native languages and food cultures than those of the majority population.

Aims of the thesis

Using different scientific perspectives, this thesis aim to explore prerequisites for prevention of childhood obesity, focusing on areas with low SES and many immigrants and refugees.

Specific aims

Paper I: To explore dietary patterns, PA and perceptions of relationships between lifestyle and health among children in a suburb with low SES and a high proportion of immigrants and refugees

Paper II: To assess trends in obesity, health beliefs, food-related behaviours and markers of PA in schoolchildren aged 11-12, and examine current socio-economic disparities

Paper III: To investigate misunderstandings in school nurses' counselling of OW pupils in multilingual settings, as well as how the nurses talk about OW

Paper IV: To analyze how school nurses expressed themselves when counselling OW children in settings where language and food culture differ from those of the majority population, with a focus on food and exercise behaviour and how the messages about them were communicated

Theories and methods

Social Cognitive Theory

Research on health behaviour and health education has yielded a family of theories with many commonalities, appropriate for use in different settings. Social cognitive theory (SCT) is used in many studies and interventions aiming at promoting health and counteracting obesity. SCT focuses on people's potential to alter and construct environments to suit purposes that they devise for themselves [126]. The theory emphasises the concept of *reciprocal determinism*, meaning that individuals and groups are not only influenced by their environments, but are also able to influence them and regulate their own behaviour. The psychological determinants of behaviour include *outcome expectations* and *self-efficacy*. *Outcome expectations* build on the idea that actions are subjective, i.e. building rather on the benefits and costs perceived to result from an action than on the objective reality. *Self-efficacy belief* originates in SCT and has been developed in many other models. It consists of a person's beliefs about his/her capacity to influence events that affect his/her life and is increasingly important, the more difficult and complex behaviours are [127]. Among the determining factors for o*bservational learning* are what people are able to observe (i.e. the environment), what they choose to pay attention to and what they remember; the process may be enhanced by peer modelling.

Overview of the research project

This project was designed with the aim of gaining a fuller understanding of a complex phenomenon, i.e. prerequisites for prevention of childhood obesity, with a focus on areas with low SES and many immigrants and refugees.

A survey was conducted in 2003 to explore schoolchildren's lifestyle habits in a low-SES area, using quantitative methods. It was repeated in 2008 in a new cohort of children in the same area. Furthermore, a similar survey was also conducted in a corresponding cohort of children in a high-SES area in 2008. The results of the 2003 survey constituted the basis for the other studies in this thesis, concerning methods used by school nurses to conduct secondary prevention.

A mixed-methods design

The ontological assumption behind this thesis is that there is one single reality with multiple perspectives. The epistemological assumption is that knowledge may be generated by the study of objects as well as of individuals' experiences [128]. Based on these assumptions, and on the need for complementarity, a design including both quantitative and qualitative methods, i.e. a mixed-methods design, was developed.

Quantitative methods

Quantitative methods are typically deductive. They require larger samples, test hypotheses, emphasize objectivity and entail the possibility of generalizing findings beyond the contextual limits of the research units and the research situation [128]. Internal and external validity, reliability and objectivity constitute the criteria of soundness in quantitative studies. Internal validity is secured if a causal relationship between two variables is properly demonstrated. External validity relates to the generalization of findings to other populations and may be

limited by the design of a study, e.g. by sampling and situation effects. Reliability refers to the stability of a measurement when repeated in different conditions. Objectivity refers to the ideal that the researcher is not biased in any way, succeeding in maintaining a distance between her-/himself and the researched phenomenon.

Qualitative methods

Qualitative research is primarily inductive and exploratory. Researchers' pre-understandings and biases are acknowledged and openly declared [129]. Methods for data collection include participating in the setting, observing directly, interviewing in depth and analyzing documents [130]. Analysis is typically interpretative and holistic, i.e. the parts are considered in relation to the context as a whole. Credibility, transferability, dependability and confirmability are among the criteria of soundness in qualitative studies [131]. To inform the reader of the findings' credibility, the study should include an in-depth description of the procedures for sampling, data collection, analyses and interpretation, embedded with data derived from the setting. Transferability refers to whether the findings are applicable in other settings, and is determined based on how the study fulfils the criteria of soundness [132]. An exhaustive description of the study is required in order to determine transferability.

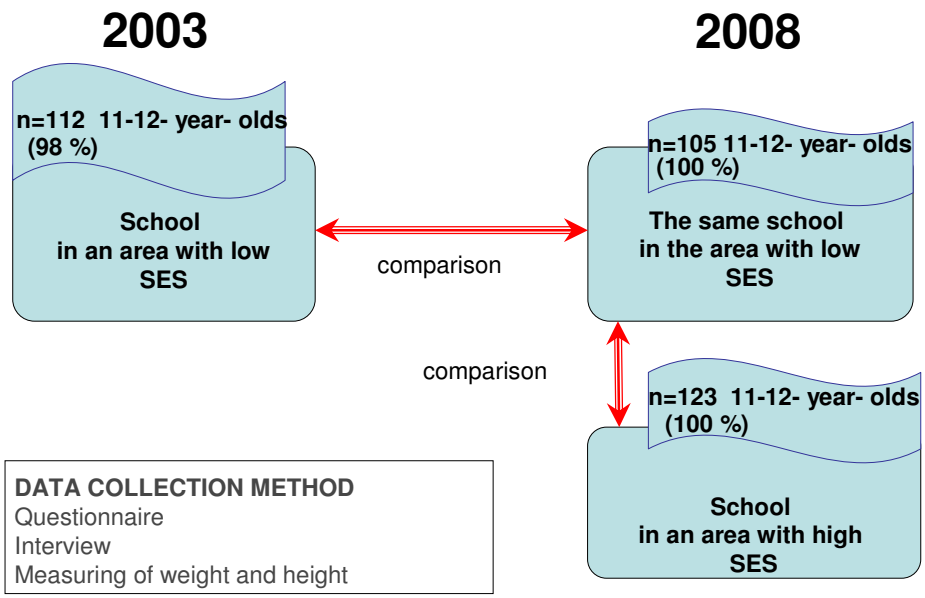
Dependability addresses the issue of whether the findings would be replicated if the study were conducted with the same participants in the same context. Most qualitative study designs are based on the assumption that reality is changeable; indeed, that it is affected by the research itself. The critical issue in the case of dependability is to state how this has been accounted for, often by thorough documentation of the research process or by allowing other researchers to evaluate whether decisions and procedures were sound. Confirmability, the aspect of whether we know that the findings reflect the enquiry and the participants rather than the researchers' biases and prejudices, is often addressed by participation of several researchers representing a diversity of perspectives.

Surveys, 2003 and 2008

Socio-demographics and local efforts to improve health

The 2003 survey was conducted in a school in north-eastern Gothenburg, an area with low SES and many immigrants and refugees. In 2008 the same school was re-surveyed. For comparison, a survey was conducted simultaneously in a school in an area at the other end of the city, 30 kilometres away and at the opposite end of the socio-economic spectrum, in 2008 (Paper II, Table 1).

Figure 1 Overview of surveys



Participating children and data collection methods

Survey, 2003
A survey of dietary patterns, PA habits, perceived benefits of a healthy lifestyle, weight and height was conducted in a school situated in a low-SES area with 6 875 inhabitants, of which 1 952 were born in countries where violent conflicts recently had taken place or were ongoing [133] (see Paper II, Table 1). All children in grades 5 and 6 (11-12 years old, n=114), were invited to participate in the study, which was conducted during school hours. Of the 114 children, 112 participated (100 were measured and 108 answered the questionnaire and were interviewed) (Figure 1).

Survey, 2008
This survey was conducted with the same design as the 2003 survey, in two schools in different areas of Gothenburg; one of them was the same as in that first survey. In the high SES area, there were 10 176 inhabitants. 63 persons were born in countries where violent conflicts recently had taken place or were ongoing [133]. All the invited pupils (n=228) participated (226 children were measured, 218 answered the questionnaire and 216 were interviewed) (Figure 1). Methods for collecting data were identical for both surveys.

Questionnaire
Food Frequency Questionnaires (FFQ) are most often designed to assess usual eating habits, with the aim of surveying nutrient intake and/or dietary patterns. They comprise a list of food items, sometimes with pictures, and questions about eating frequency and are often self-administered. Every FFQ should be pre-tested to ensure that both the meanings of food names and how to register relevant frequencies and portion sizes are clear to the subjects [134]. The main advantages are their low distribution cost and the uniformity of administration which, compared to interviews, may reduce researcher bias. On the other hand, a bias may emerge if groups of subjects do not have adequate linguistic understanding, or if food items relevant to

them are not represented in the FFQ. In such cases, inferences about food and nutrient intake on the individual and group levels will be distorted by systematic errors.

For the surveys, a study-specific FFQ and interview, covering habitual dietary intake and meal pattern quality and quantity, were used. The assessment tools were based on instruments validated for and used in the Göteborg Adolescence Study [135]. Efforts were made to adjust the questionnaire and interview for younger children and known language barriers. After a pilot study was conducted in an adjacent school with children of the same age and various ethnic origins, the language was further simplified and the questionnaire was shortened. The questionnaires were filled in by the children during school hours after a demonstration on an overhead screen accompanied by explanations and instructions. Considerations on the internal validity of the instrument are presented in Paper I.

Interview
Structured interviews consisting of a mixture of open-ended and closed questions were performed with all children after they filled in the questionnaires. The interview had two main purposes: to check questionnaire completeness and to obtain answers to additional questions. A third purpose was to estimate the internal validity of the questionnaire. If the children had not been able to fill in the entire questionnaire, it was completed during the interview. Social aspects and PA were only covered in the interviews.

Both the questionnaire and interview contained questions aimed at assessing "acculturation", i.e. duration of stay in Sweden, staple food preference, types of food eaten at home, preference for white or dark bread and whether bread was consumed as a typical Swedish open-faced sandwich.

The questionnaire's and the interview's questions concerning outcome expectations were identical: *Do you believe that you can do something to help yourself stay healthy? Do you believe that you can do something to help yourself stay healthy when you get old?* and *Do you believe that you can do something to help yourself live a long life?*

Anthropometric measurements
Body weight was measured with standard digital scales by skilled nurses, with the subject in indoor clothes, to the nearest 0.1 kg. To account for clothing, 0.5–1 kg was subtracted from the measured weight. The reason for the range rather than subtracting a set weight was that some of the children wore large sweaters and thermo-trousers indoors, as the investigation was conducted in the winter. Height was measured without shoes to the nearest 0.01 m.

Data analysis methods

Questionnaire and interview
Responses were coded and registered in Statistical Package for the Social Sciences (SPSS) (version 12.0 in the 2003 survey and version 15.0 in the 2008 survey). Descriptive statistics were calculated in the 2003 survey; differences between groups of children based on gender, consumption and PA were tested by chi-square test, with p-levels < 0.05 considered significant.

Comparisons were made between 2003 and 2008 in the area with low SES, and between the low- and high-SES schools in 2008. Differences between the low-SES school in 2008 and the

other two groups were tested by chi-square test or ANOVA, with p-levels < 0.05 considered significant. All results were sex-stratified. The distribution of BMI z-scores, compared to the normal Swedish population reference curves, was calculated by the equation presented by Karlberg et al [136] and presented as histograms. To facilitate a comparison between the histograms, smooth probability density estimates were overlaid. For this calculation and graphic presentation, we used Matlab 7.8.0 (R2009a).

The dietary assessment methods were not designed to calculate the nutritional content of the children's diets. For a rough estimation of the intake of iron and calcium; the reported frequency, portion size and combined intake of meat, vegetables and milk were assessed. Low frequency of meat intake and low frequency of combined intake of meat and vegetables were considered to constitute a risk for low iron intake, and no reported intake of milk, cheese or yoghurt was considered to constitute a risk for low calcium intake.

Communication studies

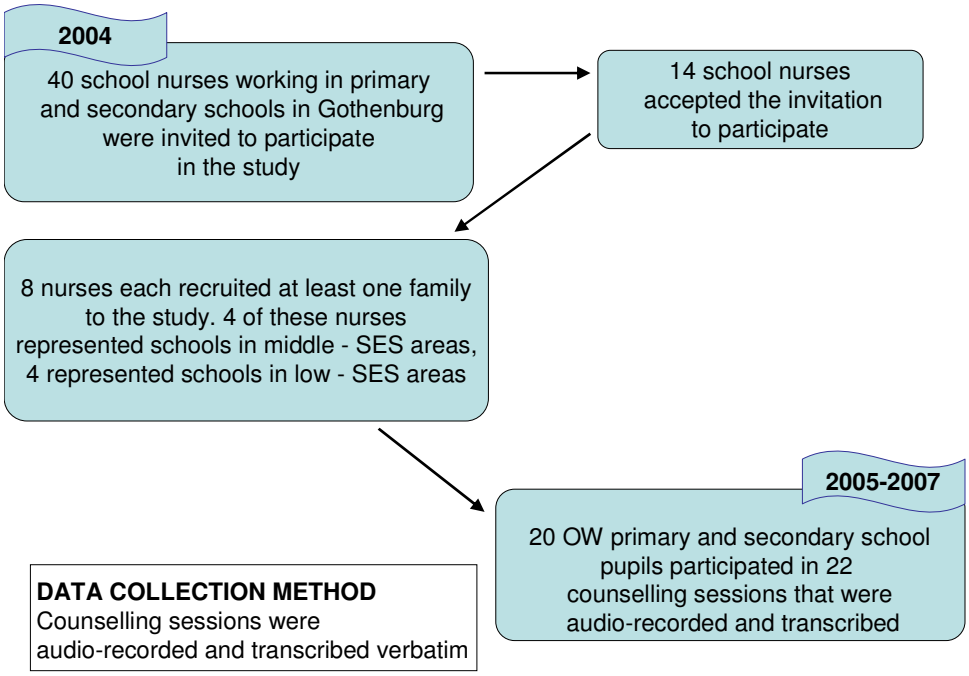
The study of school nurses' counselling may be defined as a mixed-method project in itself, since data were analyzed by both qualitative and quantitative methods.

School nurses, children and data collection methods

An explorative design was used in this study. Counselling sessions between school nurses and OW pupils were audio-recorded and transcribed verbatim. School nurses with key functions in the Gothenburg school health care organization were invited by telephone to participate in the study and to forward the invitation to school nurses in their networks. Furthermore, an invitation to participate was presented at the annual meeting for school nurses in Gothenburg. Approximately 40 nurses were contacted and 14 agreed to participate. Eight of the 14 nurses managed to recruit pupils and parents to the study and eight school nurses and 20 pupils finally participated in the study, which consisted of 22 audio-recorded counselling sessions (Figure 2) (Table 2). Two girls participated together in three sessions and one girl and one boy participated in two sessions each Session duration varied (range 16–50 minutes).

Seven of the eight nurses had Swedish as their native language. All the nurses were registered nurses with a graduate diploma in public health or paediatric and adolescent medicine. They were female and aged between 41 and 53. The distribution of the discourse, meaning the frequency of turns (i.e. the length of a person's uninterrupted utterance), number of words per turn and number of times that the participants introduced new topics, was quantitatively assessed.

Figure 2 Overview of study of school nurses' counselling sessions



The research team represented a range of different perspectives. In addition to the author of this thesis, it included a clinical nutritionist knowledgeable in quantitative methods for investigating aspects of nutrition and bio-availability, a nurse who has carried out research on communication and education in different health care settings and a nutritionist with experience of combining quantitative and qualitative methods when evaluating health and nutrition.

Table 2 Background data on pupils: gender, age and degree of OW*

Gender		**Age (years)**		**Overweight**	**Obese**
(n)		Mean	Range	**(n)**	**(n)**
Female	8	13	8-16	6	2
Male	12	10	8-14	1	11

*According to IOTF criteria (Cole et al. 2000)

Data analysis methods

Theme - oriented discourse analysis (TODA) and qualitative content analysis

The audio-recorded counselling sessions were transcribed, using a broad transcription format capturing pauses and listener support items [137]. The transcriptions were imported into QSR NUD*IST Vivo 2.0, a qualitative research software program designed for non-numerical data. The transcriptions were read and transcripts were listened to repeatedly Analyses were performed in the original spoken language – Swedish – and translated to English for the final version of the manuscript. All passages were interpreted in their context.

TODA was used to examine how language constructs professional practice [138]. In this analysis, two focal themes were identified: 1) misunderstandings and 2) how the school nurses talked about overweight and obesity. Analytical themes, chosen to elucidate how the

nurses, pupils and parents tried to handle the complex messages about OW, were: framing, footing and facework. *Framing* refers to the meaning that participants give to their current social activity [139], *footing* means to explore how roles and relationships can change during an interaction [140] and *facework* denotes strategies, mainly forms of politeness, used to 'save face' in interaction with others [138].

The results of this analysis raised questions about the content areas "food" and "exercise". To gain a deeper understanding of those areas, and how the content was communicated, qualitative content analysis [141, 142] was undertaken. Our unit of analysis consisted of a counselling session. Meaning units related to food and exercise were identified and read repeatedly, frequently returning to the recording and/or transcript of each session to assess context and meaning attached to the utterances. Codes were developed by writing down keywords that captured aspects assessed as relevant to the issues in focus. After coding all the transcripts, they were re-coded, influenced by reflections after working on the entire material, simultaneously defining each code. For examples of coding, see Paper IV, Table 1.

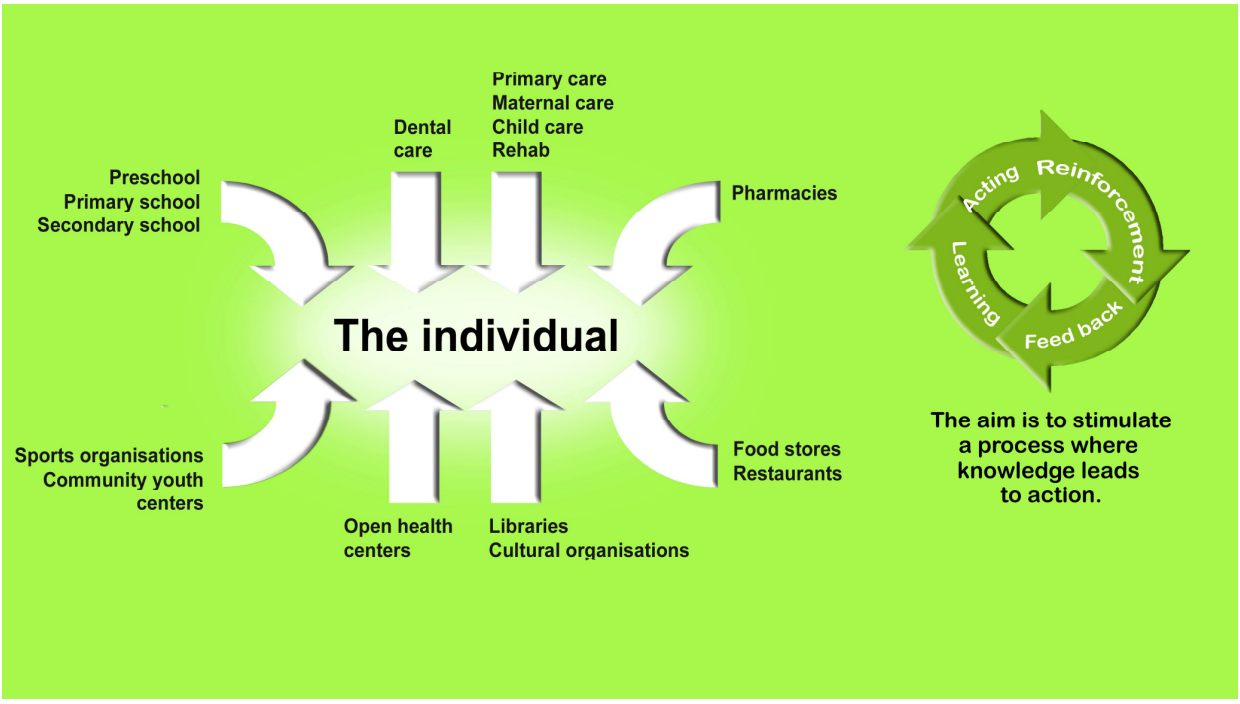
Statistics
The parameters were analysed using the Wilcoxon signed-rank test and Friedmans test. The null hypothesis was that the participants in the sessions had an equal number of turns, words per turn and introduction of new topics. The statistical analyses were performed using SPSS version 15.0. All tests were two-sided. A p-level < 0.05 was considered to be statistically significant.

Ongoing health promotion activity in the low-SES community surveyed in 2003 and 2008

In 2004, a community-based intervention, the Health Equilibrium Initiative (HEI), was launched in the low-SES area surveyed in 2003 and 2008 (Figure 3). The aims were to increase people's potential to live a healthy life and to diminish the prevalence of OW in children, with the main orientation of developing methods and local strategies. The goals were that more people would eat and exercise in accordance with the Swedish Nutrition Recommendations [143] and that those in need of support to maintain or regain normal weight would obtain it from a continuously linked health care chain spanning from secondary prevention to specialized hospital care. The model for the intervention was designed by a district nurse and the author of this thesis. It was driven by theories in the areas of health, culture, and learning.

Self-efficacy, outcome expectations, self-regulation, reciprocal determinism, collective efficacy and facilitation were SCT aspects included in the intervention platform; however, this terminology was not used at the time. For details, see Appendix. Culturally sensitive methods were developed to promote healthy food habits and increased PA, and to support self-efficacy and media literacy. Knowledge was conveyed and implications for change were discussed in meetings and other forums, such as cooking together. Staff, parents and children were the target population in the broad set of community arenas included in the intervention. Written information with basic nutritional advice was offered in 13 languages [144].

Figure 3 Working model of the Health Equilibrium Initiative. The aim was to help individuals develop knowledge and experience relevant to their health needs, facilitated by communication of current recommendations on diet and PA. The material was available in 13 languages and offered in multiple settings.



In 2006, a local health centre was opened in the neighbourhood; its primary targets were adults that were difficult to reach with health-promotion activities, for example those on long-term sick leave. Implementing a broad health concept aligning with that of the HEI, the health centre started PA activities and offered lectures on food, exercise, stress, sleep, pain and other health-related issues. This extension of the health-promoting activities in the area complemented the HEI and contributed to increased knowledge and access to health-promotion activities for many parents and grandparents.

Ethical considerations

Both surveys were approved by The Ethics Committee at the University of Gothenburg (Study codes Ö 525-02 and T 574-07). The studies were conducted during school hours and all procedures and questions were such that they might have been part of ordinary health education. All families received written information about the study before it started.

The qualitative study was approved by The Ethics Committee at the University of Gothenburg (Study code 205- 04). School nurses and pupils and, if the pupil was younger than 15, parents were informed both in writing and verbally before giving their written informed consent. It was emphasized that participation was voluntary. Confidentiality was maintained and the transcripts were made anonymous by coding.

The principles of person-centeredness should be considered in health care research as well as in practise. Research without attention to this aspect risks reducing the participants to objects

serving to meet the researchers' needs and not functioning as autonomous individuals [145]. These criteria were met regarding the surveys, since an explicit aim was that the participants should benefit from them, specifically to increase the health literacy of the children. Families were informed weeks before the surveys and a continuous discussion with school staff – including those in the school canteen - was conducted to adapt the activities to the school curricula. Procedures for measuring were outlined in collaboration with the school nurse. Results were presented to and discussed with children, parents and school staff.

When participants' voices are represented by quotes, selected by the researcher, and presented in their natural form, with "stutters, repetition, hesitancy, poor grammar and syntax and incomplete sentences" [145], unlike the "scientific" voice of the researcher, unequal positions are created. The study of school nurses' counselling sessions, albeit following ethically approved procedures, is a target for this criticism of presenting quotes without obtaining the participant's consent. However, obtaining consent in this case might have impaired credibility, an important point to consider and a potential dilemma.

Locating myself

For a long time, most of the mechanisms by which societal inequities affect health seemed obvious to me. However, I did not understand the reasons why obesity was more prevalent among those who lived less affluent lives. Understanding the consequences of energy imbalance does not require higher education, healthy food can be cooked at a low price and brisk walks cost nothing at all (except the price of good shoes).

I have worked with issues concerning children, food and health in Angered since 1980. Angered is a heterogeneous suburb north of Gothenburg, Sweden, with a long-term low SES label. As a cook at a day-care centre in the eighties, and as matron of a school canteen in the nineties, I collaborated with children and adults to promote pleasurable and healthy eating. Working my way through food production and discussions with children, parents and other professionals, my initial belief that food occupies a central role for health and identity was continuously confirmed. In the late eighties, dietician education helped me to further understand what I had been doing as a cook and matron – and parent – and, of course, opened my eyes to many new aspects of food and eating. Ten years later when I was studying to become a nurse, I obtained additional insights into the nature of health. It seemed to me that a feeling of not belonging within society's normative order placed many people at increased risk of bad health, and that this might be connected to lifestyle-related disease.
In 2001, when I started to work in primary care, obesity was an important public health problem. Every day in my work, I meet immigrants, people with low income and those belonging to neither group – all with different possibilities and problems. I have become increasingly convinced that the common use of low SES, immigrant status and residential area (usually expressed as talk about "them") as *explanations* for bad health in general, and for obesity in particular, is not only unproductive but also potentially harmful. These are labels, not explanations.

But what then are the explanations – the causes of the causes? And how can they be addressed? When I obtained the opportunity to engage in research about childhood obesity it was very satisfying to find that questions and reflections relevant for my interests had been, and were continuously being, addressed by many researchers. Today, I have a lot more questions than when I started my first job. One of these questions is, "Why is such a quantity of valuable research results not applied in practice?"

Results

Surveys of schoolchildren in two areas with different socio-economic status

Children in the low-SES area

Socio-demographics

The descriptors of the family contexts did not differ much between the surveys (Table 3). Around twenty languages were represented in the "home-language" education programme, both in 2003 and in 2008. The studies did not yield grounds for any conclusions about the children's acculturation or about any relationships between parental origin and lifestyle. Nearly all the children participating in the studies were born in Sweden.

Table 3 Descriptors of the family contexts for the children in the surveys

Family relationships	**Area with low SES, 2003 (%)**	**Area with low SES, 2008 (%)**	**Area with high SES, 2008 (%)**
Children living with both parents	75	85	87
Children with mothers employed or studying	54	61	92
Children with fathers employed or studying	69	70	96
Children with 1-2 siblings	49	54	81
Children with 3 or more siblings	44	40	12

Belief in ability to affect one's own health

Positive responses from both surveys to the questions about ability to affect one's own health are presented in Table 4. There was a significant change during the five years towards more children believing that lifestyle could affect health, significant for boys but not for girls. The question about long life evoked, on both occasions, comments from some children that one might die from violence or an accident. Several children who responded negatively referred to divine intervention.

Table 4 Children responding positively to questions about their ability to affect their health. Statistical comparisons only between percentage of children that responded positively in both questionnaire and interview.

	Low SES, 2003			Low SES, 2008 *Reference*			High SES, 2008		
	YES in the Q[1] (%)	YES in the I[2] (%)	YES in both Q[1] and I[2] (%)	YES in the Q[1] (%)	YES in the I[2] (%)	YES in both Q[1] and I[2] (%)	YES in the Q[1] (%)	YES in the I[2] (%)	YES in both Q[1] and I[2] (%)
Present health[3]	69	43 %	**37****	86	59	**55**	92	92	**87*****
Long-term health[4]	53	33 %	**27***	75	43	**44**	92	88	**82*****
Long life[5]	57	29 %.	**23**	68	36	**34**	92	82	**78*****

[1]Questionnaire
[2]Interview
[3]Present health: Do you believe that you can do something to help yourself stay healthy?
[4]Long-term health: Do you believe that you can do something to help yourself stay healthy when you get old?
[5]Long life: Do you believe that you can do something to help yourself to live a long life?

Dietary habits

In 2003, only 45 % of the children had breakfast every school day (Paper II, Table 3). Thirty-eight percent of these children had a high consumption of sweet drinks and confectionary, compared to 58 % of the children who did not have breakfast on a regular basis (non-significant). Eight percent usually ate a breakfast that contained foods rich not only in carbohydrates and calcium but also in iron and ascorbic acid. Eighty-four percent had lunch in the school canteen daily and 61 % usually had dinner with their families. Sixteen children (15 %) seemed to have a considerable risk for iron deficiency, since they reported a diet low in both meat and vegetables. Thirteen children (12 %) reported consuming no milk, cheese or yoghurt either at breakfast, in school, between meals or with dinner at home. Thus, twenty-seven children (since two combined the two potential deficiencies), or 25 %, seemed to be at risk for a low intake of iron, calcium or both.

In 2003, many children had a high intake of energy from sugar-rich products, with no significant difference between boys and girls. About 47 (28 girls and 19 boys, 44%) drank sweet drinks four days a week or more. These children had a more frequent intake of potato crisps and ice-cream, free access to sweets at home and a less regular meal pattern than the other children ($p<0,05$). Seventeen children (13%) drank sweet drinks daily. Thirteen children (12%) consumed 3.5 L sweet drinks or more per week. About 41 (38%) stated that they had free access to sweets at home.

Several changes for the better were registered in the food habits between the two surveys, differing by gender. While girls as a group decreased their intake of confectionary and sweet

beverages, boys increased their intake of fruit and vegetables. The number of children that were assessed to be at risk for low intake of iron or calcium, or both, had decreased significantly, from 25 % in 2003 to 13 % in 2008. On both occasions, when asked about a favourite dish that they would like at the school canteen, almost all the children answered pizza, with variations. Twenty-two (2003) and eighteen (2008) children, respectively, when asked to describe "other food" that they usually ate at home, characterized it with a nationality connotation, e.g. "Kurdish food" or "homeland food".

Physical activity
In the 2003 survey, we found no significant difference between boys and girls concerning PA. Ninety-nine children always took part in physical education classes. About two-thirds of the children took part in voluntary exercise – organized on the school premises – in their leisure time, at least once a week. Thirty-four percent spent more than three hours daily watching TV or using computers. This behaviour was clustered with excess intake of sweet drinks and habitually skipping breakfast, albeit not significantly.

Between the surveys, there was a decrease in participation in organized leisure-time PA, significant for girls but not for boys, and a non-significant decrease in the number of children who regularly played outside (Paper II). The significant decrease in the number of children who spent more than two hours daily watching TV was accompanied by a non-significant increase in computer use. Anecdotic evidence suggests that girls' PA, during duties at home such as cleaning and taking care of siblings, is substantial; however, this was not detected by our instruments.

Anthropometry
In 2003, 18 % of the children were overweight and 13 % were obese, equally distributed between boys and girls. A majority of the overweight children in our study – especially the obese – reported healthy habits. Thirty-five percent of the OW children, three of them obese, reported that they were happy with their weight. Thirteen percent of the non-OW children misclassified themselves as weighing too much.

In 2008, 50% of the OW children, three of them obese, reported that they were happy with their weight. This was not significantly different from 2003. Ten percent of the non-OW children misclassified themselves as weighing too much.

Between 2003 and 2008, there was a downward shift in BMI z-score for the girls in the low-SES school (Paper II, Figure 1). The prevalence of obesity decreased non-significantly in both genders. The number of girls with thinness grade 1-2 increased significantly. No children with grade-3 thinness were found in either survey.

Children in the high-SES area

The health gap is still apparent
Children in the high-SES area had significantly higher belief in their ability to affect their own health, as shown in Table 3. The majority of the children in both schools were accustomed to lunching in school and having dinner daily. For most of the other tested variables, there were significant discrepancies between the high- and low-SES areas (Paper II, Table 3). The children in the more well-to-do community had breakfast (often with a higher nutritional quality) more often, sweet drinks and confectionary more seldom, had more

vegetables with their school lunch, used both TV and computers to a lesser extent, played outside more and participated in organized sports activities to a larger extent. Four children (all girls) were assessed to be at risk for low intake of iron, and one additional girl was at risk for low intake of calcium. Pizza was, together with tacos, the most popular dish among the children in this affluent area. Tacos and Thai food were common responses to the request to describe other food that they usually ate at home.

There was one obese child in the school – who thought that he weighed too much - in the more affluent community, which was significantly less obesity than in the community with low SES. Twenty percent of the OW children, none of them obese, reported that they were content with their weight. There were no significant differences in this respect. Sixteen percent of the non-OW children misclassified themselves as weighing too much.

Communication studies

Theme-oriented discourse analysis

The nurses typically started the counselling by explaining why it was taking place and showing development of weight and height on the growth chart. Outside this context, they referred to OW in a number of ways, presented in Table 5 in Paper III. In many cases, they conveyed a feeling of uncertainty concerning what to call the condition.

The concepts of framing, footing and facework were used to examine how the messages around OW were handled by the participants. We found that nurses, by different footing, often signalled a lifeworld frame, i.e. a normative order stemming from the family's or child's perspective [146]. However, when pupils' or parents' suggestions or views did not seem to adhere to the nurses' conceptions of how to proceed, they shifted to an institutional frame - i.e. a situation that is prearranged and organized around an agenda drawn up in advance [147] - usually by claiming expert knowledge.

Misunderstandings identified in the analysis were compiled in three somewhat overlapping clusters. One cluster consisted of misunderstandings emerging from the nurses' assumption that they knew what advice the pupils and parents needed, the second seemed to be caused by nurses' insensitivity to concerns brought up by the pupils or parents and the third was related to linguistic differences.

Quantitative distribution of statistical parameters
The counselling was dominated by the nurse in terms of number of words, frequency and length of turns and introduction of new topics. In all the counselling sessions, the nurses uttered more words than the pupils and the parents (Paper III, Table 1). They also had more turns and more words per turn, compared with both the pupils and the parents. Sixteen of the pupils did not introduce new topics at any time during the counselling.

Qualitative content analysis

The findings from the analysis were reported in the form of categories, subcategories and the two themes found to be permeating the categories (Paper IV, Table 2). The categories were "Need of movement", "To control oneself and others", "Human being in equilibrium", "Roles of food" and "Food as building blocks" and the themes were "Quality of explanations" and "Enabling children and parents to mobilize resources".

Quality of explanations
Subcategories within the category "Human being in equilibrium" often were related to inadequate or inappropriate information. Nurses neither explained the relationships between energy, calories, sugar and fat nor that between energy and overweight. In six of the counselling sessions, energy was presented alternately in positive and negative terms without clarifying the ambiguity. "Food as building blocks" contained a number of factual errors. For example, the only nurse who explained that unsaturated fat is healthy but saturated fat is not, also claimed that unsaturated fat contains about half the energy of saturated fat. It was common to offer vague advice, leaving much room for interpretation. An interpreter was present only in one of the six counselling sessions requiring interpretation, and linguistic differences were common.

Advice based on traditional Swedish food habits and cooking traditions further decreased the quality of the counselling with families of foreign origin. For example, *"It's much better to cook food in the oven, because then you don't have all that fat"* relates to Swedish cooking in which oven cooking often represents a way to decrease fat content, compared to frying in a frying pan. Within the subcategories "Need of movement" and "To be in control" (see Paper IV), explanations tended to be adequate and appropriate.

When discussing a desirable meal pattern, all nurses followed the guidelines recommending three main meals and one to three smaller meals, such as fruit, daily. None of the nurses encouraged the use of popular diets.

Enabling children and parents to mobilize resources
Content in the categories "Human being in equilibrium" and "Food as building blocks" made up the bulk of the counselling. With the exceptions of the subcategories "People are whole beings" and "Seized opportunities", these categories tended to be based on general advice. "Need of movement " and "To be in control" were more likely to correspond to the individual's situation and resources. When general nutritional models were used, it was most often as support for general advice, i.e. giving advice pointing out a course for preferred action [148] on the basis of general knowledge, without anchoring it in the actual lifeworld. Occasionally, nurses skilfully adjusted the message to personal conditions.

Nurse: Then you can also think about what we call the plate model… (Mother: He doesn't eat any salad…) Nurse: What an exciting job you're going to have now! Because there are loads of vegetables. I'm going to show you the other pictures I have here. I'm really curious to hear which one you like.

"People are whole beings", "Seized opportunities" and "Explaining how to change" often dealt with eating behaviour. When addressing this subject, the nurses generally asked about habits and preferences and initiated a dialogue about, for example, spontaneous eating between meals or eating velocity.

When nurses tried to mobilize resources in families with other native languages than Swedish, they often failed due to misunderstandings. All nurses who counselled pupils with immigrant parents acknowledged, in a positive tone, the fact that food cultures differ. However, the families were very seldom offered the opportunity to give a meaningful description of their food habits and the nurses asked few questions aimed at detecting patterns that diverged from the expected. The following passage constitutes the only obvious example in which the nurse

used her general knowledge about food common in (in this case) Kurdish families, checked if it was applicable and adjusted the plate model to the family's habits.

Nurse: Yes, that you put … so what do you eat at home, do you eat a lot of rice? (F: Yes, rice) Ye-es. Because if you remember this picture, you put a pile of rice and then a pile of meat perhaps (Hm) and then vegetables on the plate. THAT'S what it looks like, more or less.

As demonstrated in Figure 1 in Paper IV (showing the subcategories positioned in relation to themes), a pattern emerged in which the appropriateness of the nurses' explanations was related to how they managed the process of enabling children and parents to improve their habits. Based on these findings, it is proposed that the dimension *Providing appropriate and adequate explanations* be added to the key function "Exchanging and managing information" in the model described by Street and Epstein [111].

General discussion

Methodological considerations

Surveys in 2003 and 2008

A common problem in epidemiological studies is non-participation, often unbalanced between study groups and with an overrepresentation among low-SES and immigrant groups [149, 44, 150, 151]. The surveys in this thesis, conducted among rather young children during school hours, have remarkably high participation rates, approaching 100 %.

When the questionnaire was validated in its original form, aiming at adolescents in grade 9 (aged 15-16), it was found to be valid for assessing habitual energy intake and ranking of subjects [152]. We revised it and tested it in a pilot study for children in the appropriate age group and community; it has not been validated after revision. Accordingly, we have used it for a less precise aim than the study in which it was originally used, i.e. to obtain a broad picture of children's food habits and dietary intake.

As a consequence of the intensified media reporting on OW and associated subjects [153], the drive to obtain a more "correct" answer may have been greater in 2008, which might in turn have caused an overestimation of the differences between the two time-points. However, since the favourable trends in anthropometry can not be explained by increased PA, which decreased, the results showing a decrease in the girls' intake of sweets and sweetened drinks are probably true.

Since there is a tendency to give the same answer to a question when asked twice, regardless of the answer's accuracy, asking similar questions in the questionnaire and in the interview is to be regarded more as an indication of internal validity then an absolute measurement. Our comparison of responses given shows overall concordance (see Paper I for details).

In spite of efforts to adjust the questionnaire, it may have failed to detect intake of pulses, lentils, vegetables and other food items that are more prominent in other food cultures than the traditional Swedish. If so, this may have caused an overestimation of the number of children in the low-SES area at risk for low iron and/or calcium intake. This concern underlines the importance of creating instruments that are valid for the whole population, both for assessment of dietary intake and patterns and for epidemiological studies in general.

Study of school nurses' counselling

Quantitative and qualitative methods may be used to complement each other and help reach a deeper and more comprehensive understanding [128]. By using three different kinds of analysis (TODA, qualitative content analysis and quantitative methods), we have offered alternative ways for the data to be exposed, i.e. method triangulation [131, 154]. The three methods each yielded results that concurred with the others.

The explicitly expressed reason for participating was the nurses' interest in supporting the development of methods for counselling OW children, and the counselling sessions that we studied were probably among the best-case scenarios. Other nurses' reasons for declining to participate were the difficulty of this type of counselling, discomfort with being tape-recorded and lack of time. Since it was the nurses who recruited the children and their parents, this process was not uniform, allowing no conclusions about participating vs non-participating families.

After data collection and the first analysis (TODA) were complete, the participating school nurses were invited, and all consented, to engage in member checking. During these meetings, the preliminary results were presented and discussed. The nurses found the preliminary results credible and accepted them as a valid basis for changing their practise. The member checking sessions did not lead to any revision of the report but did contribute additional information, i.e. concerning reasons for the uneven distribution of discourse during counselling. Dahlgren, Emmelin and Winkvist [129] approve of member checking, with the caveat that since results may be threatening to the studied group, "disagreement should not necessarily lead to full revisions of the report" (p 49). The nurses might have been expected to feel threatened in their professional role by the preliminary results and, for that reason if for no other, to disagree with them. However, the "bad news" was accepted as a point of departure for further development. This process adds to the validity of our results [155] and suggests that school nurses have high competence in an important professional skill, i.e. to critically review and refine their own practice.

Levelling out of the obesity epidemic?

Were the decreases in BMI z-scores in the low-SES area – significant for the girls and insignificant for the boys – a manifestation of a "universal" turning of the childhood obesity tide? This is suggested by the previously cited reports from several countries, indicating - albeit not consistently - that the childhood obesity epidemic is levelling off in some groups [66]. On the other hand, the persistent prevalence reported among low-SES and some minority groups and the tendencies for increase in boys in these groups reported in some studies [39, 40, 42] indicate the opposite. This imbalance is likely related to the fact that general public health campaigns, one of the suggested reasons behind the flattening prevalence curves, tend to favour those already in the best health [27, 156].

Constructs such as self efficacy, self concept and motivational beliefs are important in understanding the effects of interventions that aim at "culturally targeting" and "tailoring". [157]. To ease the burden of childhood obesity for those most susceptible requires efforts driven by behavioural theories that allow for reaching such groups. The potential of obesity prevention interventions rooted in appropriate theories has been demonstrated in several studies [88, 89, 94, 158].

The HEI intervention, conducted in the low SES area during the years between the surveys, was continuously followed up in a manner required for further funding. However, since this

funding did not allow for a control group, the hypothesis that the lower BMI z-scores were results of the HEI is impossible to either verify or disprove. The fact that the intervention was theoretically driven with constructs aligning to SCT and initiating health-promotion activities and networks in the area (see Appendix) [159] might, however, support this hypothesis of "HEI effects".

The results of the surveys thus indicate that there are potential benefits of a theoretically driven joint health intervention but that the basis for conclusions about causality is limited. The uncertainty about the causes of improved habits is linked to the complex nature of childhood obesity, which impedes the evaluation of prevention interventions. Involving many aspects of everyday circumstances and activities in families, schools and the larger community, this outcome is difficult to assess by randomized controlled trials [160]. Non-randomized controlled trials [88, 89] may be conducted, but many interventions - like HEI - suffer from a scarcity of funding, restricting investment in evaluation appropriate for allowing experiences to reach the scientific community. The importance of finding ways to incorporate lessons learned from such interventions (including evaluating not only outcome but also processes) has been acknowledged by many researchers and stakeholders [161].

Children in the low-SES school

Dietary habits

The increased consumption of fruit and vegetables and the decrease in sugar consumption represents a higher degree of agreement with the SNR and thus improved prerequisites for overall health. This is illustrated by the significant decrease in the number of children at risk for low iron and calcium intake, a logical effect of the groups' increased relative intake of nutrient-dense food items.

Among the girls, there was a significant decrease in consumption of sweet drinks, sweets and fatty snacks, which probably contributed to the decrease in BMI z-scores [162]. In 2008, the boys had increased their frequency of fruit and vegetable consumption, compared to the boys in 2003. This gender difference connects with male-female patterns of eating; it tends to be more socially acceptable for males to eat more [163]. Significantly fewer girls in 2008 than in 2003 had free access to sweets at home, indicating a change in parenting style. This change is likely to be the result of increased overall societal attention to the problem of excess sugar consumption [153], further stimulated by ongoing local health-promotion work. Perhaps parents tend to be more restrictive with obesity-generating food in relation to girls due to greater concern about girls becoming OW. Among adults, men seek help for obesity to a lesser extent then do women [164] and women generally seem to be more troubled by excess body weight [165]

Physical activity

As PA is an important determinant for health [166], it is a cause for concern that the reported level was lower in 2008 than in 2003, with a significant decrease in girls' participation in organized sports. During the five-year span, several violent shooting incidents occurred in the area, which may have led to more restrictions on moving around outside for girls than for boys. The anecdotic evidence suggesting that girls' PA is underestimated underlines the need

for research methods developed in concordance with the characteristics of the researched group.

Interestingly, the qualitative study showed that school nurses offered more person-centred counselling on PA then on food. Perhaps the presumptions about patterns of OW children's exercise are not as strong as those about food patterns. Most of the counselling on PA concerned increasing moderate PA to vigorous PA, implying that the value of diminishing sedentary activities for obese children [167, 168] was underestimated.

Energy surplus and overweight/obesity

In the 2003 survey the overweight and, even more markedly, the obese children were more likely to be among those reporting healthy habits. There are alternative explanations for this, not mutually exclusive:

1) OW children under-reported their intake of energy-dense food. This notion is supported by previous studies including validation of reported energy intake by the double-labelled water method [169, 170]. Reasons may include teasing, rendering OW children a sensitivity for being accused of gluttony or laziness, which might make them cautiously avoid answers that could lead in such a direction.
2) OW children may neither have consumed more calories nor had a lower degree of PA than normal-weight children; the social norms for eating and exercise behaviour simply afflict them more because of their genetic predisposition, or factors such as stress or sleep deprivation. Such causality could explain the promising results of obesity-prevention interventions building on behavioural theories that highlight the importance of social norms.
3) OW children may have been the subjects of previous "corrective measures" by the health care system and/or the family and thus, well-informed about the "correct" or "preferred" answer, produced it when asked about their habits.

Regardless of how these alternatives interplay, it can be concluded that there are several possible pathways for the energy surplus to emerge and many modes by which a child may perceive these processes. Providing general advice about food as frequently done by the school nurses in the counselling study, assuming that sugar is an essential part of the problem for the individual child, may be truly irrelevant. And, even if relevant, until the child agrees that this is the appropriate issue to discuss, it would not be a productive subject for advice. Concerning the decrease in BMI z-scores in girls between 2003 and 2008, the results allow for energy balance as explanatory factor. The decreased sugar consumption represents a powerful reduction in calorie intake which may well have compensated for decreased PA.

"My weight is just right"

In both surveys, a considerable proportion of the OW children stated that their weight was just right. This finding may be linked to other research, in which this underestimation has been found to be quite common, especially among boys and men, possibly contributing to the gender difference in the flattening-out of prevalence curves [171-173]. Body dissatisfaction in general does not serve as a motivator for engaging in healthy-weight-management behaviours [21], especially in overweight adolescents [174]. Thus, professional support to adopt habits that allow for reaching and maintaining a healthy body weight [175] is more desirable than generating increased discontent. This issue also encompasses the question of normal-weight

youth feeling too fat, with adverse health effects [21]. The results of the communication study reported in Paper III indicate that if health care professionals neglect to reflect on and discuss how to formulate messages about OW, they will beat about the bush and try to attenuate the message by using many words, thereby conveying that the issue is charged, as a result of centuries of obesity stigma.

Belief in the ability to affect one's own health

Belief in the ability to affect one's own short- and long-term health and longevity corresponds to the SCT construct outcome expectations. This concept is, together with self efficacy, another psychological determinant, believed to be central for many health-related behaviours [126]. Blum underlines the importance of the closely related concept resilience for "those reared in adversity" [176]. No association was found between outcome expectations and lifestyle habits on the individual level. However, since adolescents' health behaviour develops in interaction with their environment, including peers [177-180], an influence on the group level cannot be ruled out.

Disparities between communities

What are the causes of the causes?

How are the relationships between SES and OW prevalence to be explained? The lifestyle habits that differed between the children in the high- and low-SES areas in the 2008 survey are relevant not only for general health but also for the rates of OW [162, 181-184], exemplifying mediating factors between SES and OW. Research has yielded many possible explanations for this. Skipping breakfast can be related to decreased availability of familiar breakfast items after migration [185], traumatic experiences that alter the routines and structures of family life [186] or tradition [187]. Consumption of sugar-rich food and drink may be related to low media literacy, susceptibility to advertisement or the relatively cheap calories [56]. Refraining from playing outside can be associated with perceived low security in the area [188] or not being used to the climate conditions. Participation in organized exercise may be related to parental economy, possibilities to commute to sports grounds [49] or to duties at home.

Children in the low-SES area had probably lived less sheltered lives, illustrated by the insight expressed by some of them that lifestyle may not determine length of life. As expectations concerning the outcome of lifestyle change affect the motivation for carrying out such changes, this difference in experiences may be part of the explanation for different habits [126]. There is no consistent evidence on the impact of neighbourhood or built environment on the prevalence of childhood obesity [189] .

Exploratory research methods, for example in-depth interviews or focus interviews, could be applied to shed light on the interplay between factors affecting energy balance and SES. Knowledge of the occurrence of health inequity is well established in the Swedish context [190] and such research should not restrict itself to monitoring but rather yield building blocks for interventions aimed at narrowing the health gap [156].

Can ethnicity help explain disparities?

Certain aspects of ethnicity seem to be important agents in the obesity epidemic [191] but since the concept is neither stable nor commonly defined, it makes a poor starting point for analysis [63]. The results of our surveys did not allow for conclusions related to ethnicity or

acculturation, which can be explained by reciprocal determinism and observational learning [126]. Children with parents originating from many countries, attending the school and representing diverse cultures, influence their environment, resulting in the development of new patterns of beliefs and practices, many of them common. This is illustrated by the similarity of the children's preferred food in the school canteen (pizza!), which certainly implies the opposite of cultural diversity, at least in this respect.

Other studies demonstrate pitfalls in grouping and generalizing about children based on parental origin. Substantial disparities in the prevalence of OW within an immigrant group (children of Sub-Saharan origin living in Australia) were mediated by variations in diet, PA and sedentary behaviour [192]. de Wilde and co-workers found that children of Turkish origin in the Netherlands had a significantly higher prevalence of obesity than those of Dutch origin. The authors note that public health campaigns may not have been directed towards Turkish parents [42] and that in Turkey itself the prevalence of obesity for the relevant age group was approximately the same as in Dutch children in the Netherlands.

At present, there seems to be a more acute need of research addressing issues such as, "What in society or the health care system is so dysfunctional that it yields diverse health outcomes for different groups?" rather than seeking explanations within the subgroups in question.

School nurses' counselling - a potential contribution to narrowing the socio-demographic gap in the obesity epidemic

The results imply that when nurses did not agree with suggestions or comments from the children or parents, they shifted from signalling a normative order, originating from the family's or child's perspective, to indicating a more institutional attitude based on the superiority of their professional knowledge. This aligns with children's views, presented by Mäenpää and co-workers, that school nurses were cheerful and talkative but that counselling lacked reciprocity [193] One interpretation is that the nurses endeavoured to conduct person-centred counselling, i.e. counselling conducted with respect and understanding for the rights, values and beliefs of all parties, but that the domains of knowledge – the lay and the professional – were not equally valued. The resulting mode of counselling is incompatible with the principles of person-centred care as well as with those of culturally competent care, interpreted as critical consciousness [108, 113].

The nurses' mentioning or not mentioning of OW reflects the current stigmatizing of obesity but, perhaps most salient, also an easily understandable uncertainty. On the one hand, a positive body image is a key issue both for self-esteem [194] and for a positive outcome regarding weight management. On the other hand, children and their parents need explanations of outcomes of lifestyle and other changes [193]. Offering such explanations and working on potential solutions together requires the use of words that cover the issues at hand. Another tentative adverse effect of the reluctance to talk about OW is that it may convey the feeling that the condition is too disgraceful even to mention. In order to be able to encourage the children and families to relate weight concerns to health rather than appearance, school nurses must reflect on which concepts might be appropriate, and discuss the issue continuously with their peers. The importance of these aspects is further underlined by the significant increase in thinness for girls in the low SES area 2003-2008, aligning with earlier reported findings [67].

The barriers for optimal counselling found in the communication studies tended to be especially troublesome for children with other native languages and food cultures than the dominant ones. The observed scarcity of interpreters seems to be common in many settings, both in Sweden and other European countries [195-199]. If the spoken language is poorly understood and the nurse has shallow knowledge of the food cultures under discussion, counselling quality will deteriorate.

There is some evidence that schoolchildren from low-SES conditions are more prone to follow advice from the school nurse, which implies an important potential in school health care for levelling out inequities in health [200]. Furthermore, children with low SES depend more on the quality of the advice from the nurse and shortcomings in communication and managing of information in school health care consequently generally constitute a larger drawback for this group.

One of the "missing pieces" for optimal counselling seems to be adequate and appropriate information about energy balance. Any counselling on nutrition, aiming at deeper levels than providing general advice, must cover variations in many aspects of the food culture. In order to meet the clients' needs, nutrition counselling in a context in which many different food cultures are represented requires broad knowledge of food items, cooking procedures, habits connected with food and eating as well as acculturation [201]. Access to continuing education and guidelines for professional collaboration are suggested in order to improve counselling.

It is worth noting that 15 of 22 counselling sessions in this study concerned obese children. According to regional guidelines, obese children should be treated in primary care or specialized hospital units [202], while the school nurse's task is to provide additional support, as in the case of any child with a chronic disease. However, since neither primary nor hospital care of obese children has as yet been fully developed, school nurses often shoulder the responsibility for treating them.

Many researchers have contributed with valuable findings to develop school nurses' practice, investigating important aspects such as children's perspectives, communication, implementation of action plans, levels of organisation and development [103, 193, 203]. However, proficiency in subject knowledge is seldom problematized when discussing the prerequisites for successful communication. A suggestion implied by results presented in this thesis is that "level of subject knowledge" should be added to the list of parameters to be investigated when studying aspects of communication.

Conclusions

- Differences in prevalence of obesity and many lifestyle parameters between children living in areas of varying socio-economic status were substantial. This may be regarded partly as a function of a society that fails to meet the needs of some of its inhabitants.
- Population-based community interventions focusing on healthy diet and exercise habits may affect the prevalence of childhood obesity, but strong evidence of their impact is difficult to obtain in the public health setting.
- When school nurses counselling obese and overweight pupils did not agree with suggestions or comments from the children or parents, they shifted from an approach

based on the family's or child's perspective to a more institutional attitude based on the superiority of their professional knowledge.

- When school nurses counselling obese and overweight pupils gave inadequate/inappropriate explanations, it was most often associated with a less skilfully managed process of enabling children and their parents to use their personal resources.
- School nurses counselling children with languages and food cultures that are not traditionally Swedish face additional difficulties.
- To optimize counselling, school nurses should be provided with opportunities to cooperate with other professions.
- These studies all suggest that obesity prevention interventions should be developed and implemented in close cooperation with the targeted groups.

Implications

Looking ahead, adding some personal reflections to the results and discussion presented in this thesis, I would like to describe the fundamentals of prevention of childhood obesity as follows:

On the secondary prevention and treatment level

In order to offer optimally person-centred and culturally competent care, every professional must acquire, develop and maintain knowledge and skills that are relevant for her or his profession. Multi-professional teams with a scientific approach must collaborate to undertake prevention and treatment and to effectively counteract the obesity epidemic on the individual level.

On the primary prevention level

If high-risk populations are to benefit from primary prevention, interventions must be driven by theories that allow targeted groups to define their problems and set agendas, automatically tailoring the interventions for those concerned. In contrast, if health-promoting campaigns are planned and launched by people with significantly different life experiences and options than the target groups, an even more thorough tailoring will be needed to cover the different cultural and socio-economic perspectives. To secure a sound evidence base when designing childhood obesity prevention initiatives, the health authorities should provide funding for adequate scientific evaluation of population-based interventions.

On the societal level

Stigmatization of obesity and discrimination on ethnic grounds both contribute to placing responsibility on the individual. Instead, the focus should be shifted to necessary changes in societal norms and structures. Stakeholders on different levels should critically review their domains. Is the environment sound and healthy for all, regardless of economical or social position and has discrimination on ethnic grounds been eliminated? Have the interests of groups and individuals with other perspectives then the established ones been taken into account? Has the privilege of formulating the problem been moved from those with the power to discriminate and to prevent discrimination, and instead disseminated in society? Asking these questions and integrating these concerns at all societal levels is fundamental for prevention of childhood obesity.

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Appendix

The Health Equilibrium Initiative (HEI) (Jämvikt 2004)

Background

In Gothenburg, as in other places, data from multiple sources over a long period of time have demonstrated a health gap between individuals in areas with low SES and many immigrants, on the one hand, and more affluent areas, on the other. This health gap can partly be attributed to discrepancies in food and exercise habits. Resting on this knowledge and inspired by the troubling results of the study conducted in 2003, a community intervention was launched by the Primary care organisation in cooperation with the local municipal councils in north-eastern Gothenburg. The aim was to improve the prerequisites for a healthy life and the main goal was to diminish the prevalences of OW by developing methods and local strategies. Other goals were that more people should eat and exercise in accordance with the Swedish Nutrition Recommendations and that those in need of support to maintain or regain normal weight would obtain such support from a continuously linked health care chain spanning from secondary prevention to specialized hospital care.
The model for the intervention was designed by a district nurse and the author of this thesis. It was based on theories in the areas of health, culture and learning and evaluated by continuous follow-up.

Health has been described, based on the WHO Ottawa charter definition, as a "…major resource for social, economic and personal development and an important dimension of quality of life"[204]. It has also been stated that every individual has her/his own health motives [205] and her/his own self-image that determines to what extent and how she or he acquires new knowledge and/or changes behaviour. Thus, it is not to be taken for granted that individuals' perception of what is good for them corresponds to the established societal norm. To carry out an intended behavioural change, each person must believe that there are better alternatives to his/her present habits and also have real options to adopt the new behaviour. The task of the HEI staff was to inform individuals and groups, to support them to develop their knowledge based on their own conditions and to facilitate healthy choices. Autonomy,

meaning individuals' right to make informed, un-coerced decisions, is considered to be one of the prerequisites for good health [206]. Our view of the meaning of healthy choices included the conviction that obesity and its secondary diseases generally have a deleterious effect on autonomy and quality of life.

Culture and **ethnicity** are considered to be concepts that describe processes. Born into cultural and social systems, human beings also possess the ability to adjust to different contexts and to develop new cultural patterns [2]. It is quite normal to simultaneously belong to several cultures, for example based on age or profession.

Our view of intercultural communication was that it exists everywhere where people from different cultures, e g. from different ethnic or socioeconomic status groups, meet. Planning and carrying out health-promotion work requires specific knowledge about factors that may single out individuals not belonging to the norm-setting groups in society. If such factors are not taken into consideration, those most in need of support may feel that they are not included in the target group [2, 207]. Examples of such knowledge are combinations of food, cooking techniques, perceptions of clothing or climate that may be an obstacle to PA and different views on the significance of age or gender. Linguistic barriers should also be eradicated.

The **learning** process was fundamental in the project. To a major extent, this process is, for individuals as well as for groups, determined by their previous experiences. Accordingly, methods for development of knowledge must be adjusted to the respective target group. A fact considered to be crucial for the pedagogical approach was that the individual internalizes new knowledge only if and when she/he perceives that it will bring her/him closer to her/his own aims in life [208]. The method was based on the basic presumption that the seeking of knowledge should emanate from needs and issues within the target person or target group [209]. This was expected to be a multi-faceted course of events, in that the populations and HEI staff's questions would be answered, leading to new ideas and issues. Knowledge about healthy food and PA was transferred while encouraging individuals and groups to influence their environment, for example the food served in day-care facilities.

There was a broad set of arenas outlined where the available resources available were offered, as illustrated by Figure 3 in the thesis.

Implementation

With regard to individuals, efforts were made to individualize counselling and information – as stipulated by Swedish law on patient safety [2] - on the basis of knowledge about food and cultural or religious issues, e.g. Ramadan. Regarding groups, the cultural adaptation was of a general nature. Efforts were made to engage interpreters when needed and to try new ways of making meetings attractive for everyone, not only those already well integrated in society, for example by creating bi-lingual groups with intercultural interpreters.

We made it clear that it was not self-evident to eat typically Swedish food and that there are many ways to reach the goal of healthy eating. We explained the climate conditions behind the traditional Swedish food culture and the reasoning behind the development of the plate model. It was also often explained that different staples, such as potatoes, bread and pasta, are of equal value. Inviting participants to share their experiences was a consistent item. Important common characteristics among human beings, such as the preference for sweet and

fatty foods, were also acknowledged, as were the determinants for children's development in accepting different kinds of foods. Aspects such as presentation of different approaches to feeding children were welcomed as interesting contributions to the discussion, and the nutritional perspective was presented when requested. Economic deprivation was always accounted for, i.e. that access to a variety of foods and after-work or after-school activities were not self-evident.

The basic offer was that the HEI staff - at no cost to the participants- attended a daytime or evening staff meeting lasting one to three hours at for example a day-care centre, kindergarten, school or primary care unit. During these meetings, prerequisites for health were presented and discussed, with the focus narrowing down towards the aetiology and consequences of obesity and relevant food and activity issues. The staff was supported in identifying target issues to be addressed and a plan was jointly created. Most often the issue was promoting healthy dietary patterns, for example, school children eating breakfast, or counteracting parents' habit of giving their pre-schoolers sweets when picking them up from day care. Parental meetings, with interpreters for selected groups, were conducted at day-care centres and kindergartens throughout the area. Cooperation with teachers and school nurses in a variety of activities to promote breakfast-eating or healthy school cafeterias was also abundant. By promoting and facilitating self-guided activities and working for a continuously improved understanding of how to achieve a healthy diet and an appropriate PA level, we hoped to counteract not only obesity but also other health problems associated with calorie-rich and nutrient-poor food and a sedentary lifestyle. One consistent theme was emphasizing the strong influence that overt and hidden advertisement in the media has, especially on children's choices, and encouraging parents, teachers and others to elucidate this and train the children in media literacy.

Other activities:

- The HEI was consulted to inform newly arrived refugees and other immigrants about food in different educational contexts.
- Together with the midwives from the antenatal care centre, a model for group meetings to support obese pregnant women to maintain a healthy weight gain during pregnancy was launched and further developed.
- Paediatric nurses at the paediatric health care centres expressed a need for cooking sessions with new parents to teach them how to cook for their babies, making the buying of pre-fabricated baby food optional. This was also accomplished within the framework of the HEI.
- Cooperation with, among other parties, the local health centre and the dental care organization resulted in information leaflets.
- The HEI was the convening party in a network aimed at promoting the health of the schoolchildren in the district.

Evaluation

Process evaluation

- The evaluation consisted of follow-up reports. We had a checklist for all events (cooking groups, lectures, breakfast promotion lessons, information to staff, etc) including number of participants, gender, age, type of meeting, aim, and responses to the questions "Have we done anything that might be harmful?", "Have we met the

needs of all participants?" and "What are the implications of this activity for developing our methods?".

There was no plan for outcome evaluation.

References in Appendix

[1] WHO. Ottawa Charter for Health Promotion, 1986

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