Project report

1. Introduction
   1. Epidemiology of childhood obesity

Obesity is becoming a worldwide epidemic public health problem with poorly understood syndromes affecting both children and adults regardless of gender and ethnic/racial group (2). Since 1971 its prevalence is increasing in USA, UK, Japan, France and Greece (1). United States has the highest rate of prevalence of childhood overweight and obesity as compare to other countries (2).

Among European countries, the Scandinavian countries have lower rate of childhood obesity prevalence as compare to Mediterranean countries even though the proportion of obesity is rising in both cases (3). Approximately, 30% of Europeans countries are affected by obesity and its development is leveling off (5). As expected, the obesity trend in children is rising that leads to more severe health related consequences (2).The prevalence rate of obesity is at highest in the developed countries but it also increasing in developing countries being highest in middle East, central and eastern Europe (3).

Norwegian Children’s prevalence rate of overweight and obesity is similar to those reported in Northern and western European countries but lower than those reported in United States, United Kingdom and southern European countries (2, 5).

An epidemiological study conducted by University of Bergen (Norway) to estimate the prevalence of childhood overweight and obesity and to identify the socio-demographic risk factors involved showed that 14 % prevalence of obesity. This study also found out those socio-demographic factors such as age, sex, Ethnic origin, family size, educational and occupational status of parents that affect the prevalence.

#### Why we wanted to write about the topic “Children’s attitude towards physical activities?”

The trend around the globe is that obesity among children is increasing, and Norway is no exception. There are different reasons for this, related to especially diet and level of physical activity. We wanted to check out how children’s relation to physical activity is; because child obesity is on the increase, does it mean children are less physically active? But most of all, we felt it was important to see how the children’s attitude towards physical activity is. We hope their attitude could give us some answers. Are they becoming obese because they are less physically active? Because they don’t like physical activity? Or do they want do to more physical activity but they are not able to? And are we right in thinking that children now a days spend so much time on the computer that they get obese from it? We hoped to clear up some of these questions by finding out about their attitude. We felt it was better to look at the attitude, because what they are actually doing that is physical activity, is mainly the surface, while their attitude towards it is what one needs to work with in order to change anything else.

1. Methods

Methods of project

Ethics

When working with children as research objects or informants, it is very important to remember the ethics of research. Because children are below legal age, their parents or legal guardians need to consent for them if they are to participate in research of some kind. In our research for this project we were not to gather sensitive information like name, address, or other information that would make it easy to identify the participants.

The school wanted us to give information to the parents a couple of days ahead of the survey, and we wrote in the information that as long as they did not object to their child participating, it would be seen as consent. The information sheet also said that the survey was completely anonymous, and it included some information about us, EiT and our project. The background for this were NSD’s (Norsk samfunnsvitenskapelig database – Personvernombud for forskning) guidelines for what to include in a consent form [[1]](#footnote-1).

Qualitative/quantitative

When selecting which method to use for our research, there were a lot of different factors to take into account. First and foremost was the limited time. We only had three/four weeks to both execute the research and write a report, and our time would be split half between this and learning more about group work. Therefore we needed something we would be able to do with the time available. Another factor was that we always needed to keep in mind that all group members had to use their competence at some point during the project, so we had to consider using some competences for the research that we couldn’t use elsewhere.

Because of the short time and that we wanted to find out how the attitude towards physical activity is in general, we decided to do a quantitative study in the form of a questionnaire. The answers from this questionnaire would be objective data as a result from empirical measurements (Creswell 2003:173). At the same time the questionnaire would also be partly a qualitative procedure, because of the questions where the informants could fill in quite some information themselves. This information would need to be interpreted and thus removing us from the objective quantitative requirements.

In addition to the questionnaire, we chose to do a drawing exercise, both so we could include Berit’s competence and also to get a broader picture of the informants’ answers. This would be the most qualitative part of our research, as all the analysis of the drawings would consist of interpreting them using different strategies (Creswell 2003:205-208)

Our procedure for the research is hence a mixed method procedure, using both qualitative and quantitative methods within the same study, as is becoming more and more normal. Also it could be seen as a quite natural emergence when mixing social sciences with human sciences (Creswell 2003).

# Theory on written method/questionnaire

Within pragmatics, the study of language in use, language is seen as a communicative activity or mean. Communicative activities generally have a specific aim, and to reach that aim we apply certain strategies to our language (Svennevig 2001:11-13). In this project our aim was to get certain information from children, hence we needed to find the right communicative strategy for doing so.

The most basic communicative need in this situation was the need for information, and the most obvious way of obtaining this is by asking (Svennevig 2001:18-19).

We needed to consider whether it would be best to ask in personal conversation or in text. Because the decision had been made to do a quantitative research, we found it best to go with retrieving the information in writing. There were several reasons for that. First of all; gathering information in writing is less time consuming. Second; in personal communication the interviewer could draw inferences of the communicative content and hence apply his or her personal interpretation on the material (Svennevig 2001 63-68). The final decision was therefore to make a questionnaire.

Here we needed to think of possible misunderstandings; both in conversation and in text, but mostly in the latter, there will always be the risk of the participants in the communicative situation misunderstanding the intended message. For us this is necessary to consider when looking at the answers from the questionnaires; there is always a possibility that the children (the recipients) could have misunderstood the question coming from us (the sender), or that we could misinterpret the answer (Svennevig 2001). For example the answers can be ambiguous, and so we (here; the recipients) need to decide whether to interpret it one way or the other.

One way of avoiding misunderstandings like this is to make sure that the people involved in the communicative situation have mutual background knowledge (Svennevig 2001:53). We therefore needed to make sure that the questions we wrote were on a level where the recipients would have the same knowledge as us, thus we attempted to write in a suitable manner with words that would be part of a 10-12 years olds’ knowledge, and also make the content of the questions customized for achieving this goal.

## METHODS FOR VISUAL SOCIOLOGY

When we started our project, we asked ourselves what methods could most adequately elicit the voices of the children. We wanted to include both written –based and image – based methods in our project, to elicit the voices of the children as thorough as possible. Pat Thompson - Professor of Education and Director of Research at the University of Nottingham – claims that there has been a “visual turn” in the social sciences. This has led to an increase in the visual research, sometimes called image – based research (Thompson 2008:8). One of the reasons for this, is that visual sociology offers different ways to elicit the experiences, opinions and perspectives of children. Research with children can be seen as student “standpoint research” which, among other reasons:

* Addresses issues of importance to the student and is thus in their collective interests
* Allows marginalized perspectives and voices to come center stage
* Is geared to make a difference

(Thompson and Gunther 2007:311)

In our case, we also had to consider how to approach the visual research. Thompson describes two specific ways of doing this:

1. To take visual artefacts and to investigate their production, uses and interpretations; called *the sociology of the visual*
2. To manufacture visual artefacts as part of the process of doing research; called *visual sociology.*

(Thompson 2008:8)

We decided on the visual sociology for our research, as this was the most adequate method for our task, using drawing as our medium. This means we involved children in making drawings as part of our research project. As the main concern with our research project was to let the children at fifth grade at Bispehaugen school have a say about their physical activities, the drawing exercise would be related to this topic. We chose to let the exercise be to draw any favorite leisure activity, to elicit the children´s attitude towards physical activity without any restrictions. We were careful not to give the students any ideas on what to draw before they started the exercise. In this perspective, we see our project t as an opportunity to “giving voice to the voiceless”, the word *voice* here referring to both verbal and non – verbal means to express opinions. Article 12 of the United Nations Convention on the Human Rights of the Child (United Nations 1990), states that governments and nations

*Shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child.*

The visual research part is also important in that the drawings communicates in a different way than words. Children are themselves interested in drawing and images, and therefore visual research matters to researchers interested in the lives and experiences of children. Visual research methods may elicit different responses than methods which are primarily speech and written word – based. This is why including the drawing exercise was important to us in this project. There is also an aesthetic aspect present here. Elliot W. Eisner - former president of the NAEA, the International Society for Education Through Art and the American Educational Research Association - points out that visual work can be a sensual experience for children. The processes of making images should therefore also be seen as an aesthetic practice and experience (Thompson 2008: 14). An understanding of the pleasures of drawing and its aesthetic dimensions should therefore also be considered; *The process of producing visual data may mean more to the children than just the research and its outcome* (Thompson 2008:15).The children seemed to enjoy the drawing process. Children involved in visual research might feel they get something out of the participation, seeing it as an opportunity to do something else than word – based schooling (Thompson 2008:15). In this perspective, the visual research is useful in more than one aspect.

**METHODS**

The UNCRC advocates for the rights of children to express themselves and participate in decision –making on matters that affect them (Birbeck & Drummond, 2007:21). Moreover, adults who make decisions on behalf of the children should ensure that the best interest of the child is upheld, by providing the care and support that the children require. Yet, for a long time, very few children have found their voices in research due to researchers’ concerns about children’s competence, power of communication and cognitive abilities. However, Birbeck and Drummond further observe that, “ if one engages children appropriately in information gathering process, there is no reason why their perceptions and thoughts should not be regarded as competent” (ibid:21). This appropriateness implies moving from adult-centred view of children as incompetent and begin to look at them as knowledgeable on matters that affect them. It also entails using methodologies which support their intellectual and social abilities. One such methodology is Clark’s Mosaic approach. It recognises Mallaguzzi’s principle of “*The Hundred Languages of Children*” in which they can express themselves. She points out that it is,

a strength-based framework for viewing young children as competent, active, meaning makers and explorers of their environment. ..The Mosaic approach brings together a range of methods for listening to young children’s perspectives about their lives. Observation sits alongside participatory tools. It seeks to understand how children ‘see’ the world in order to understand their actions. (Clark, 2005:29).

The participatory tool used in this pilot project is affording our informants, who are 9-10 years old to express their activity preference by making a drawing in a task called ‘*My favourite activity’* and giving a reason.*’*. In relation to the project topic on the children’s attitudes towards physical activity, such an activity treats them as experts on the subject matter and opens the way for various perspectives of children on various activities. But it still affords researchers the opportunity to gather the children’s views in relation to physical activity. The reason for their choice of activity is sort and compared to their response in the questionnaire on a similar section for the sake of validity. This is particularly so because of limitations of time and other material resources to allow for triangulation through other research methods like interviews to discuss the drawings. Moreover, different methods are appropriate for different age groups. Johnson observes that younger children may be interested in drawing and playing games (2008:2). Furthermore, Punch notes that using drawings as a research method can be creative fun and encourages children to be more active in the research with the added advantage of more control over their form of expression (2002:331). As the drawing was done before the questionnaire was administered, it gave the children a relaxed environment but still prepared them for the more challenging and involving task of answering the questionnaire. The second instrument was used due to time limitations considering the 3 weeks intensive nature the village in which a project has to be completed and submitted; otherwise other participatory methods would have been used. The questionnaire covered various aspects of everyday life starting with school in the morning to various activities after school, in their free time and holidays. This makes it easier to follow the sequence pattern enabling the children to easily recall what they are involved in. Although not necessarily recommended in qualitative research (Seale et al., 2007: 407), the questionnaire was used to get a wide perspective of children on various activities in the limited time available. In combination with the drawing, it broadens the view and offers opportunity to triangulate the children’s attitudes. As such , use of both qualitative and quantitative methods facilitates proper analysis of results to the question at hand. All in all, this project respects the views of the children and affords them chance to express themselves in a relaxed setting, away from the influence of authoritative parents and teachers. Birbeck and Drummond conclude that:

Children’s voices can be heard in research by understanding that children can participate in meaningful ways if the research environment is one in which they feel safe, supported and valued. The research environment must be seen through the child’s eye (2007:27).

1. Theories
   1. Medical background of obesity

According to World Health Organization (WHO), overweight and obesity are defined as abnormal or excessive fat accumulation with body mass index (BMI) greater than or equal to 25 and 30, respectively (WHO, Obesity and overweight Fact sheet N°311May 2012). In short, it represents a condition where a pathological excess of body fat is present in an individual (Aycan, 2009). There are two categories of fats, the dietary fat and body fat. The former represents the fat which is taken as part of food serving as source of energy and vitamins to our body, as a building block of membranes and compounds essential for controlling blood pressure, heart rate, blood clotting and other body functions. In addition, dietary fat is important to healthy development of brain, hair, skin and nails (Health people library project, 2006).

On the other hand, body fat refers to the fat that constitutes human body and contributes to a person’s weight or body composition. It protects the body from losing heat and damage by covering it and also serves as source of energy when other sources are exhausted. Since the majority of body fat is not utilized by the body, excess fat in body leads to weight gain and impairment of health (Health people library project, 2006).

It is difficult to determine exactly the amount of body fat per se using direct methods such as hydro-densitometry, bioimpedance or DEXA. Thus, practically either BMI or body fat percentages is used to define and to track obesity (Aycan, 2009). BMI is a measure of weight-for-height calculated by dividing person's weight in kilograms by the square of his height in meters. Although it is imprecise, BMI is widely used especially in defining cutoff for adulthood obesity as it is easy and correlate sufficiently with direct measurements.

Conventionally, BMI value between 18.5-25 is normal while BMI value greater than or equal to 25 and 30 is an indication overweight and obesity, respectively (Aycan, 2009, WHO, Obesity and overweight Fact sheet N°311May 2012). This way body weight classification is crucial as it well correlates the risk for medical complications of obese patients, which increase at BMI levels above 25. A BMI greater than 27 is associated with incidence of hypertension, hypercholesterolemia, and diabetes mellitus while a BMI less than 25 is associated with increased social and psychological complications of weight gain (Aycan, 2009).

Body fat percentages measure of weight, height, and the amount of fat on different body parts to estimate body fat percentages. In general, Women with more than 32% body fat and men more than 25% body fat are considered obese (Health people library project, 2006).

Obesity is not just a problem for adults, as teenagers, adolescents, and even pre-schoolers are beginning to show signs of obesity in greater and greater numbers. This might explain why obesity is becoming a major global as well as national (Norway) issue among children escalating the concern about children’s health and well-being (Flegal et al., 2006).

In childhood, there is not a universal definition of obesity and overweight as children are constantly changing weight due to normal growth characterized by a sharp increase during infancy, peaking at about 9 months and decreasing thereafter until about 6 years before rising up. Thus, the assessing healthy weight requires comparing the BMI of a child with the BMI of other children of the same age, gender, ethnic origin and social class (Flegal et al., 2006; Aycan, 2009).

Unlike adulthood obesity that is defined based on fixed BMI values related to health risk, childhood obesity is defined using percentiles of BMI-for-age in a specified reference population as there are no clear risk-related values of BMI (Flegal et al., 2006). In line with Centers for Disease Control (CDC) BMI charts (table 1), in some countries childhood obesity is defined as the 95th percentile or greater of BMI for age, and those with BMI between the 85th and 94th percentiles are considered as overweight (CDC,; Speiser et al., 2005).

CDC Children BMI Classification for Age Percentile [Age 2-19]

|  |  |
| --- | --- |
| **Category** | Age Percentile |
| **Underweight** | ≤ 5th percentile |
| **Healthy Weight** | 5th to the 85th percentile |
| **Overweight** | 85th to the 95th percentile |
| **Obese** | ≥ 95th percentile |

Alternatively, ideal weight for height percentage can be used to describe childhood obesity. Accordingly, a weights being greater than 120% and 140% of ideal weight indicate obesity and sever obesity, respectively (Mei et al., 2002).

Consequences of obesity

Since childhood obesity is a multisystem disease, a disease involving various systems, it is associated with different short-term and long-term consequences that can be categorized into medical and non-medical complications (Ebbeling, 2002; Lee, 2009).

Medical Consequences

The medical consequences of childhood obesity can be broadly classified into cardiovascular, metabolic, gastrointestinal, pulmonary, skeletal, psychological and other complications based on the system affected (Table 2, Daniels, 2006, future children). These complications have been widely studied in obese adults as their development takes years to be manifestations in obese children (Aycan, 2009).

Cardiovascular complications

Normally, the heart pumps blood, which circulates throughout the body carrying oxygen and nutrient within the blood vessels. Arteries, which move blood from the heart to the rest of the body, control blood flow by constantly responding to the pressure by the blood exerted on their walls. Obesity directly or indirectly interferes with normal cardiovascular function leading several adverse outcomes such as hypertension, atherosclerosis, dyslipidaemia, heart disease (such as left ventricular hypertrophy) and stroke (Daniels, 2006, future children).

Hypertension, or high blood pressure, is one of the common complications of obesity both in adults and children. Several studies showed that compared to non-obese children, obese children are at higher risk for hypertension and the risk increases across the entire range of BMI values picking at or above the 90th percentile (Daniels, 2006, Lee, 2009). Changes in multiple physiological processes such as insulin resistance, over-activity of the sympathetic nervous system, activation of the renin-angiotensin system leading to increased renal sodium re-absorption and reduced natriuresis (excretion of sodium in the ureine), and abnormalities in vascular structure and function were suggested to be contributor of obesity-associated hypertension in children (lee, 2009).

Left ventricular hypertrophy (increased thickness of the heart’s main pumping chamber) has been associated with childhood obesity. It is more severe in children and adolescents with increased BMI that endanger their future cardiovascular health. It is mainly dependent on lean body mass as there is a direct physiologic relationship between the development of heart and body’s muscles. On the other hand, fat mass and systolic blood pressure have pathologic relationships with left ventricular mass increasing the risk of a heart attack (Daniels, 2006).

Despite lack of strong evidences, childhood obesity contributes to the pathogenesis of atherosclerosis, a process characterized by hardening of the arteries that begins as a fatty streak on the artery’s inner lining and progresses into a fibrous plaque (a raised lesion) leading to either a heart attack or a stroke by blocking blood flow to the heart or to the brain. Studies showed that adults with childhood obesity are more prone to develop atherosclerosis than adults with no childhood obesity history (Daniels, 2006).

Metabolic Disorders

As the metabolic system normally involves a variety of interrelated processes that control how the body uses and stores energy, any changes in the system lead to a multitude of alterations such as insulin resistance, the metabolic syndrome, dyslipidemia (abnormal levels of fat in the blood), and type 2 diabetes mellitus. Obesity especially in adulthood results in these alterations leading to these metabolic changes (Daniels, 2006).

Childhood obesity is associated with insulin resistance, the process in which the action of insulin is retarded probably because of reduced tissue sensitivity to insulin (Daniels, 2006). Insulin resistance in turn leads to glucose intolerance, hypertension and dyslipidemia as evidenced by an increase in the prevalence of type 2 diabetes mellitus in children and adolescents with increase of childhood obesity prevalence (Lee, 2009).

The metabolic syndrome represents an ensemble of medical disorders such as elevated blood pressure, increased triglyceride and decreased high density lipoprotein cholesterol concentrations, and raised blood sugar levels that increase the risk for cardiovascular disease and other disorders such as type 2 diabetes, fatty liver disease, polycystic ovary disease, and obstructive sleep apnea. Abdominal obesity and insulin resistance are the main cause of metabolic syndrome (Daniels, 2006).

Childhood obesity directly and indirectly causes dyslipidemia characterized by higher levels of total cholesterol, low density lipoprotein (LDL) cholesterol and triglycerides accelerating atherosclerosis in obese children and adolescents. However, it was evidenced that the severity of the dyslipidaemia is not determined by obesity (Lee, 2009).

Pulmonary Complications

The main pulmonary complications (conditions affecting the lungs) of childhood obesity are asthma and obstructive sleep apnea. Asthma is a chronic disorder characterized by narrowing of airways because of inflammation reversibly obstructing the airways. On top of allergic, genetic and environmental factors, childhood obesity contributes to the pathogenesis of asthma as evidenced by a parallel relation between their prevalence. It was reported that children with a BMI above the 85th percentile had an increased risk of asthma regardless of their age, sex, ethnicity, socioeconomic status, and exposure to tobacco smoke. However, it is not clear whether obesity causes asthma or the other way round. Obesity associated increase in inflammation, mechanical pressure on lung function and change in lung function might contribute to asthma. On the other hand, limited physical activity in children with asthma may be a risk for obesity (reference?).

Both adulthood and childhood obesity are associated with obstructive sleep apnea. Obstructive sleep apnea (an abnormal collapse of the airway during sleep) results in snoring, irregular breathing, and disrupted sleep patterns. It is one of the most important but also most under-recognized medical complications in overweight children. Sleep disruption can lead to excessive daytime sleepiness, decreased physical activity and school performance, increased risk of further obesity and long term adverse cardiovascular consequences, learning disabilities and memory defects. An epidemiological study found that one-third of young severely overweight patients had symptoms associated with obstructive sleep apnea and 5 percent had severe obstructive sleep apnea (33, Daniels, 2006).

Gastrointestinal disorders

The gastrointestinal (GI) system controls food intake and thus it is strongly related to obesity. Conversely, obesity contributes to liver disease and gastroesophageal reflux disease. There is not any powerful evidence that shows the association between childhood obesity and gastroesophageal reflux disease (Daniels, 2006). On the contrary, growing data from cohort studies showed that non-alcoholic fatty liver disease (NAFLD) as a metabolic consequence of obesity and a common cause of chronic liver disease in obese children as evidenced by higher liver enzymes levels in obese children than non-obese children (Lee, 2009). Fat starts to deposit in the liver in response to obesity and initially the deposits are relatively innocuous. However, the deposits later lead to steatohepatitis, which can then progress to fibrosis, cirrhosis, and even to end-stage liver disease and liver failure, ultimately requiring a liver transplant (37). Insulin resistance, hyperlipidemia, and increased oxidative stress are implicated in the pathogenesis. Increased insulin level and lipolysis because of insulin resistance stimulates fatty acid synthesis in hepatocytes and leads to hypertriglyceridemia, respectively. These in turn result in accumulation of triglycerides in the hepatocytes inducing cytochrome P450 2E1 activity and generation of free oxygen radicals that cause lipid peroxidation and cytokines ligand induction, which leads to cell death and fibrosis (28).

Skeletal Abnormalities

The most common childhood obesity related skeletal abnormalities (orthopedic problems) include hip problems (slipped capital femoral epiphysis), and abnormal growth of the tibia (Tibia vara, or Blount disease). Some complications of obesity are physical, the effect of excess body weight, rather than metabolic, or the effect of increased adipose tissue (dan).

Tibia vara, or Blount disease, is a mechanical deficiency in the medial tibial growth plate in adolescents that results in bowing of the tibia, a bowed appearance of the lower leg, and an abnormal gait. It often affects boys older than age nine who are overweight 47.

Slipped capital femoral epiphysis, a disorder of the hip’s growth plate, occurs around the age of skeletal maturity. In this disorder the femur (the bone in the upper leg and hip) is rotated externally from under the growth plate, causing pain, making it impossible to walk, and requiring surgical repair. It is more common in overweight males and in African Americans. In about one-third to one-quarter of afflicted children, both legs are affected. Avoiding abnormal weight gain can prevent such orthopedic problems.48

Psychosocial Consequences

Psychological consequences, which involve psychological health and the ability to relate to family members and peers, are probably the most prevalent complications. Childhood obesity is also linked with various psychosocial problems such as depression (widely studied), poor body image, and low self-esteem and confidence, reduced health-related quality of life in physical, emotional and social aspects (lee, 2009, dan, 2006).

Depression is the most widely studied psychological consequence of childhood obesity. However, it is not clear whether obesity causes depression or the other way round. Depression itself is often associated with abnormal patterns of eating and physical activity that could result in future obesity; however, obesity may also result in psychosocial problems that can produce depression (Daniel, 2009). Childhood obesity is one of the contributors for discrimination and stigmatization of obese children in school and it might partly explain why obese children have difficulties with peer relationships and have few friends (lee, 2009, dan, 2006). An important psychosocial issue for overweight children and adolescents is quality of life. This was confirmed by a study that reported a significantly lower health-related quality of life and five times risk of impaired quality of life in obese children and adolescents than their normal-weight counterparts. And obese children and adolescents with obstructive sleep apnea reported even lower quality of life might because of increased daytime sleepiness (dan, 2006).

Other medical complications

In addition to these medical adverse outcomes, childhood obesity leads to a multitude adverse health effects such as polycystic ovary syndrome (a constellation of abnormalities including abnormal menses, elevated levels of circulatory androgens, acne, excessive growth of hair, and polycystic ovaries), pseudotumor cerebri (raised intracranial pressure), gallstones (hard, pebble-like deposits that form inside the gallbladder), arthritis (a condition characterized by pain, swelling, and stiffness in the body’s joints), gout (a clinical manifestation of uric acid accumulation leading to the development of needle-like crystals in the joints, under the skin, and kidney stones), cancer (post-menopausal breast cancer, kidney cancer, esophageal cancer, colorectal cancer, and endometrial cancer), exercise intolerance and others (Ebbeling, 2002; Daniels, 2006; Health people library project, 2006; Lee, 2009).

Non-medical complications

Non-medical complications of childhood obesity equally require attention and contribute in tackling of obesity. The main non-medical complications are social consequences that result from psychological complications and economical expenditures. The former includes all those psychological factors that against obese child consequently leading to less education, lower incomes and higher poverty rates in the society. The economical expenditures encompass obesity-related medical treatments and expenditures that significantly increase the overall expenditures of society (Finkelstein et al., 2005; Covic et al., 2007; Lee, 2009).

Causes of obesity

Normally bodyweight is regulated by maintaining the balance between energy intake and energy expenditure. There are several factors that disrupt this balance either by increasing energy intake or reducing energy expenditure leading to obesity. Development labor saving device as a result of advancement in technology is the principal cause of reduced energy expenditures. In addition other factors like genetic, behavioral and social factors play a role in the pathogenesis of childhood obesity ( 16, 19franklien, 2005).

Genetic factors predispose a child to an obesity-conducive environment. Deficiency in a certain genes directly or indirectly increases the risk factor for developing obesity. For instance, leptin gene is important for expression of leptin, a peptide hormone that plays a key role in maintaining of energy intake and energy expenditure balance. Any abnormality in leptin function that might be because of deficiency of leptin and reduced leptin sensitivity of tissue is associated with a higher risk of childhood obesity by affecting appetite and metabolism (Leptin As Fat Orchestrator Jaime Hennessey1\*, Communicated by: Dr. Andrew Dobson1, Reviews in Undergraduate Research, Vol. 2, 12-18 , 2003). Studies confirmed that the derangements in other genes such as hypothyroidism and growth hormone deficiency may indirectly lead to childhood obesity (19).

More importantly childhood obesity is affected by personal lifestyle choices, cultural environment, behavioral and social factors including bad eating habit, sedentary life style (lack of exercise) and family factors (8, 16).

Diet

Natural and healthy foods are best for the human body. Previously, it was not easy to get food and people ate small portions and few meals per day. However, over time it becomes easy to afford foods though most of them are unnatural and unhealthy (8). The nature/composition, calorie, amount and frequency of a diet play a profound role in the obesity.

For healthy physiology, foods should contain proteins, carbohydrates and fats. Proteins are important for growth, building and maintaining body's organs, tissues, and muscles, and for facilitation of digestion (8). Carbohydrates rich diets, which normally provide energy, such as bread, ready-to-eat cereals, potatoes, soft drinks, cakes, and biscuits increase blood glucose level and control appetite. Frequent consumption of these foods induces hormonal cascades that stimulate hunger and cause overeating, which in turn increase risk for central adiposity, cardiovascular disease and type 2 diabetes (16). Beverages with high glycaemic index, particularly fruit and soft drinks, are responsible for increased energy intake and excessive weight gain because incomplete compensation for calories consumed in liquid form. By contrast, milk, a low glycaemic index beverage, seems to protect overweight young adults from becoming obese (16, 18). Fats help growth, to insulate the body, to create some hormones, to absorb some vitamins, and to have healthy hair, skin, and hearts (8).

There is no a strong and direct relationship between prevalence of childhood obesity and fat intake though excess consumption of fats leads to obesity. This necessitates the consideration of other factors such as the type of fat as saturated fat are more risky than unsaturated ones (16,19). Despite lack of supporting evidences, increased calories consumption significantly contribute to the ascending trend of childhood obesity as it might affect satiety and food consumption (16, 18, 19). During eating more calories than the body can use up, the calories will be stored and converted into fat cells increasing risk for overweight or obesity (8).

Eating behavior is also another risk factor of obesity and is influenced by parent-child interactions and the home environment. Eating in restaurants leads to increased energy consumption than family dinner might be because of energy dense foodservice by the restaurants. Besides, family dinner improves diet quality (less saturated and trans fat, less fried food, lower glycaemic load, more fiber, fewer soft drinks, and more fruits and vegetables) (16).

Sedentary lifestyle or lack of physical activity is strongly associated with increased risk of childhood obesity as evidenced by epidemiological data that show increased prevalence of obesity in children with sedentary behaviors like watching television and playing computer games (8, 16, 19). Watching television promotes weight gain by reducing physical activity and increasing energy intake. Increased food intake and advertisement of unhealthy foods on television are the main contributors of increased energy intake while viewing television (16).

* 1. **PHYSICAL ACTIVITY**

In today’s technological advances, simple tasks are being mechanised and children are exposed to sedentary leisure activities before the screen, thereby increasing inactivity in a lot of them. This has led to the increase in non-communicable diseases including overweight and obesity among children. A study notes “during the last 3 decades, the prevalence of obesity has tripled among persons aged 6-19 years.” (MMWR, 2011:1). Cavill et al note that physical inactivity is estimated to account for nearly 600 000 deaths per year in Europe (2006: ix). The significance of physical activity on the general health of the people including children is immense. It is used as a preventive measure and slowing down the progression rate of chronic diseases. These diseases are heart disease, stroke, diabetes and obesity among others. In various studies conducted at different times across Europe, it was shown that physical activity greatly reduces the incidence of obesity and other non-communicable diseases. Erlichman and others report that “The alarming rise in childhood obesity and its role in promoting cardiovascular disease in adulthood noted an inverse relationship between physical activity and body fat” (2002:274). Many other studies indicate the same. They note;

Over the past half-century scientific data have continued to accumulate indicating that being physically inactive or unfit has major negative health consequences throughout the lifespan and is an important component of a comprehensive approach to chronic disease prevention and health promotion.( Haskell et al, 2009:280)

Another example is that reported by World Health Organisation (WHO), they note, “There is conclusive evidence that physical fitness and health status of children and youth are substantially enhanced by frequent physical activity” (WHO, 2010:20). The role of physical activity in management of weight and obesity can therefore not be overemphasised. It is important therefore that the attitudes of the children towards physical activity are assessed especially in the current technological age, where lack of time or simply no interest at all are likely to influence these feelings.

Physical activity is defined as “any force exerted by skeletal muscles that results in energy expenditure above resting level” (Cavill et al, 2006:2). Such activities are basically the routine type that children can be engaged in such as dancing, skipping, brisk walking, jump rope, swimming, cycling, playing football and other games among others. Physical activity is categorised at different levels depending on the intensity and these are; low, moderate and vigorous activity. Intensity has to do with the amount of effort made by an individual in the physical activity. Low intensity means that very little energy above the resting level is expended. Moderate intensity activity is that which increases the heartbeat, makes the body warm, with one becoming slightly breathless. The third category of physical activity is the vigorous one which is mainly sweaty and leaves persons breathless (Ibid, 2006:3). Measurement of physical activity encompasses type of activity, time spent on it, frequency (how often) as well as intensity (how hard) (WHO, 2010:18). Our focus for the study is the moderate form of physical activity, and the extent to which the children are involved in this. By considering their attitudes towards such physical activity, it is easy to ascertain the factors leading to the increase in childhood obesity cases. Moreover, WHO recommends that individuals must be engaged in adequate levels of physical activity throughout their lives, including children and young people who should achieve at least a total of 60 minutes of moderate-intensity physical activity in most days of the week (Ibid, 2006:3). To get the full health benefits of physical activity, the children’s attitudes must be taken into perspective and design approaches that maximise these benefits. In the process of carrying out these physical activities, it is important that they are conducted in a funny manner to keep the interest of the children high. Apart from the immense physical health benefits that physical activity offers, children also acquire social skills, self-positive image and a high self-esteem as well as academic achievement and general high performance (Ibid, 2006; Haskell, 2009).

There are various levels of factors that influence the attitudes towards physical activities both in the adults and the children. These occur at individual micro and macro- levels as outlined by the European World Health Organisation in their paper (Cavill, 2006:13). The macro-level factors are mainly socio-economic conditions including free-time, fear of traffic, security reasons and social status to discourage engaging in physical activities. One example can be a child avoiding walking to school when the parents own a car as it is not expected by society. At the next level is micro including urbanisation, place of residence and proximity of facilities. There are fewer manual jobs as most simple tasks like washing and climbing stairs have been replaced by washing machines and escalators respectively. As such, there is very little activity that the children are routinely involved in whether they have a positive or negative attitude towards physical activity. WHO-Europe suggests that our lives should integrate activity in our daily routines and not an option in order to embrace active living (Ibid, 2006:3). The last factor, and of particular interest to our study has to do with the individual. The major ones that play against involvement in physical activity are lack of time, perceived benefits, social support, personal safety and being too exhausted among others.

* 1. **CHILDHOOD PART.**

The well-being of children is a concern for many from individual level and family to that of national governments to international institutions. One such area of concern is the children’s health for now and for the future, especially with the rise in obesity cases recently. Following a study conducted in Canada, Santrock notes:

A major concern regarding childhood obesity is that obese children tend to become obese adults, facing an increased risk of diabetes, heart disease, orthopaedic problems and many other chronic diseases. Increasingly, paediatricians are seeing a rise in incidences of childhood hyperlipidemia, hypertension and diabetes (2004:39).

Norway is no exception. Juliusson and others note that overall obesity prevalence of primary school children in Norway is of concern (2010:1). This therefore calls for effort of not only the adults, but the children themselves to be involved and take an active role and make a difference in matters that affect them. In the social studies of children, childhood is longer seen as just an early part of the life-course, a preparation for the future, but a life that has to be lived meaningfully at the present moment. It considers children as active participants in society who are capable of influencing or shaping as well as being shaped by the occurrences around them (James, 2009:35). In relation to the issue of obesity, children must be viewed as competent individuals who can take charge of their own health (just like adults) when provided with the necessary information concerning their development, and physical health including lifestyles that can be adopted in order to maintain it.

Santrock defines development as the “pattern of biological, cognitive and socio-emotional changes that begin at conception and continues through the lifespan (2004:34).The biological encompasses changes that occur in the size of the body, cognitive, covers the child’s thinking and intelligence while the socio-emotional involves the child’s relationship with other people and changes in personality. In the biological development Santrock notes that as the children get into elementary school years, they gain greater control of their bodies and physical action is essential to refine their developing skills.(ibid:39). But Santrock is quick to note the pattern of development is a complex one as the three areas are interwoven (ibid: 34) and therefore influence each other, more or less. No child develops exactly in the same way as the other, hence their competence in taking an active role in matters that affect them, does not necessarily have to do with the chronological age but the social age as proposed by Clark-Kazak (2009). The social age is more realistic as the experiences of children vary widely in relation to the society they are found in. In the social age notion, “expectations hinge around when children are seen as having achieved understanding, or competence appropriate to that situation” (2003:90). For Norwegian children, the role they can play in reducing the prevalence of child obesity is clearly stated in the National Framework Plan 1996 which advocates for outdoor activities (*friluftslivet*) as good for overall development of the child. Writing on such practices in the Norwegian culture, Nilsen, points out that, it is the top agenda of the government “to enhance children and young people’s opportunities to develop physically, socially and mentally through walking and playing about in, and experiencing nature” (2008:43). These children are involved in outdoor activity from an early age, and such activities are essentially their culture and everyday life, they have an experience that makes them equipped and competent to express their thoughts and feelings on physical activity.

Based on their attitudes, especially in the technological age of spending time before the ‘screen’ it is essential to collect information about their thoughts and feelings and how these views in a way, can be used to influence the fight against obesity and make appropriate interventions. Although outdoor activity is basically part of the daily routine of an average Norwegian child from day care through elementary school and even at home, there has been concern shown in what Nilsen terms the ‘discourse of worry’. She refers to Tingstad (2003) and Buckingham & Bragg (2004) who raise concern that many (post)modern childhoods are associated with many negative influences as participants in the global child market and the growth in sedentary leisure pursuits, threatening the happy, healthy, outdoor, Norwegian childhood (Nilsen,2008:47). With such modern influences therefore, it becomes essential to hear from the children. At this point, they have enough experience and exposure to these activities and therefore have their own views which would help towards reducing the prevalence of the scourge. When children’s perspectives are taken into consideration in whatever interventions have to be made, they feel valued and have a sense of ownership, and would therefore, be more committed to it. This is in line with the three P’s principle of the UNCRC of 1989, which advocates for protection, provision and participation. Children can be protected from the dangers of obesity by providing them with sufficient information. The third aspect is participation, which according to Shier (2001:111), based on Roger Hart’s ladder of participation categorises as listening, supporting, taking the perspectives into account, involvement in decision-making and finally sharing responsibility. At all these levels, it is the responsibility of adults that have the responsibility to ensure that when children are expressing their views, they must given careful attention, be supported with different means of expression and take deliberate measures to be inclusive at the rest of the levels. When responsible adults act in such a way, they are actually upholding “the best interest of the child” a paramount principle for the UNCRC to which many nations are party including Norway. Parties to the article should ensure that the views of the children are considered as paramount in relation to age and maturity of the child. Each level is viewed from different perspectives namely openings, opportunities and obligations. (Ibid: 110). A sound approach to be more inclusive in considering their views must be to weigh the benefits and risks involved.

The consideration of children’s welfare both for now and for the future, takes into account the views they hold towards certain matters that concern them. Obesity is one such case and if taken as a problem that has to be tackled by adults only, the children may feel being imposed by the adult ideals and are likely to defy the adult authority and take things their own way. However, when viewed as active participants in matters that affect their own lives, and not passive recipients of adult ideals, they become valued members of society who perceive themselves as agents of change. In our study of gathering children’s thoughts and feelings, the project recognises them as stakeholders who can make a difference in relation to the problem through their active participation. This is what is referred to as agency in the sociology of children. From the Wikipedia, **agency** refers to the capacity of individuals to act independently and to make their own free choices. But for this agency to be realized, the structural factors including the differential power relations between adults and children and how such factors can be enabling or constraining. Shier notes that taking the views of the children into account does not “imply that every decision must be taken in accordance with the children’s wishes or that adults are bound to implement whatever children ask for” (Ibid:113). So the views of the children cannot be implemented and met in entirety but that as decisions are made by the concerned adults, the views of the children are considered and their best interest upheld. The project also recognises the extent and limitations of the children competence and therefore used methods within the limitation of time, which were participant friendly but could still provide sufficient views on the data required.

1. Results

In this part of the report, we will present the results we have obtained through questionnaires and drawings.

* 1. Questionnaires
     1. Status of children in term of physical activity

To analyse our results we have combined some of the answers, and looked at them in relation to others, in order to investigate their attitude towards physical activity. Figure 1 gives an overview of how many children are physically active or inactive during different parts of the day, based on how they get to school and the activity they involved in during the breaks at school, and what they do after school.

Figure 1: The overall status of children’s activity level during the day.

As summarised in Figure 1, most of our informants (91.18%) are physically active before school activity as they walk or ride bike to get to school. Out of these 51.61% are girls and 48.39%. Most of the children (73.53% out of which 44% girls and 56% boys) answered that they were engaged in different physical activities during the school breaks, including activities such as playing with friends, football, "Sura," "Boksen Går," "everything-game," swing, murderer, dance, running around, "Hoppetau", walk around, and basketball, which confirms their physically active status. Some children (26.47%), however, said that they spent the break doing activities that do not involve physical activity, such as sitting still, thinking and chatting with friends.

All but one of the children (97% out of which 54.54% girls and 45.45% boys) said they were involved in different physical activities after school. Figure 2 summarises how the children answered in terms of what kind of physical activity (organised/unorganised) they were involved in. Accordingly, most of them (76.47% out of which 53.85% girls and 46.15% boys) answered that they were involved in both organized and unorganized activities, two (5.8%) girls said that they were involved in organized activity only, and three (8.82%) boys were involved in unorganized activity only.

Figure 2: Number of children involved in different types of physical activity

We then wanted to know more about their attitude towards physical activity, and asked them what kind of physical activity they liked the best. The results from this are presented in figure 3.

Figure 3: Number of children who prefer different types of physical activity

Figure 3 depicts that something about children’s attitude towards physical activity. The majority (79.41% out of which 54% girls and 46% boys) answered that they prefer to be involved in both organised and non-organised activity. Three children (8.82% of which 66% girls and 33% boys) said that they prefer to be engaged in organized activity only. Similarly, three children (8.82% of which 33% girls and 66% boys) said that they prefer to be engaged in unorganized activity only. Only one boy (2.94%) expressed that he would not like to do any physical activity at all.

* 1. Frequency of organized physical activity the children do a week.

Here, we asked how many times a week children were doing organised physical activity. The results are shown in figure 4.

Figure 4: showing how many times a week boys and girls do physical activity

* + 1. Frequency of sitting in front of computer

Here we wanted to know how many days a week children are using a computer or playing videogames (such as playstation, X-box, Nintendo, etc.). The results from this question are presented in figure 4.

Figure 4: Showing how many days a week the students are using computers or video games.

* + 1. Attitude towards physical activity

We also wanted to look at children’s attitude towards physical education and if they would rather like to walk or bike to school. 32 out of 34 children expressed that they liked physical education and 31 out 34 said they preferred to walk or ride their bicycle to get school, rather than taking the bus. Figure 5 shows our results from these questions.

Figure 5: Shows children’s attitude towards physical education and walking/biking to school.

When giving reasons for liking PE, most of the children that liked physical education stated that they like it because of things such as “it is fun”, “it involves a lot of sports”, “creates chance for them get out of class room and work out”, “makes the muscles work”, “enables one to be more fit and stronger”, “improves body shape and makes them active”. Being quite good at physical education was also given at a reason for favouring it. Those children who

did not favour of physical education mentioned the tiresome and exhausting nature of it as the main justification for their choices.

* 1. Drawing

The students were asked to draw a detailed drawing describing one particular activity, they enjoy doing in their leisure time that could be physical activity or non-physical activity. Accordingly, 34 children (16 boys and 18 girls) drew their favorite activities that can be categorized as physical activities and other activities.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Drawing motifs | | Gender | | |
| Boys | Girls | Summary |
| Physical activities | Football | 3 | 5 | 8 |
| Handball | 0 | 5 | 5 |
| Riding | 0 | 2 | 2 |
| Dancing | 0 | 1 | 1 |
| Skiing | 1 | 0 | 1 |
| Tae –kwon -do | 1 | 0 | 1 |
| Other physical activity (playing outside related) | 3 | 1 | 4 |
| Other activities | Music lessons, choir, band | 2 | 3 | 5 |
| Computer games | 5 | 0 | 5 |
| Other motifs (book, picnic) | 1 | 1 | 2 |
| Summary |  | 16 | 18 | 34 |

Table 1: The activities that the fifth grade students prefer to do during their leisure time.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Gender | Physical activities drawing motifs | | | | | | | Other drawing motifs | | | Summary |
|  | Football | Handball | Riding | Dancing | Skiing | Tae –kwon -do | Other physical activity  (playing outside related) | Music lessons, choir, band | Computer games | Other motifs (book, picnic) |  |
| Boy | 3 | 0 | 0 | 0 | 1 | 1 | 3 | 2 | 5 | 1 | 16 |
| Girl | 5 | 5 | 2 | 1 | 0 | 0 | 1 | 3 | 0 | 1 | 18 |
| Summary | 8 | 5 | 2 | 1 | 1 | 1 | 4 | 5 | 5 | 1 | 34 |
|  |  |  |  |  |  |  |  |  |  |  |  |

22/34% of the children drew physical activities and out of whom 14/22 % were girls and 8/14% were boys. Specifically, 8/34%, 5/34, 2/34, 1/34, 1/34, 1/34 and 4/34 selected football, handball, riding horse, dancing, skiing, Taekwondo, other physical activity (playing outside and related activities), respectively. More girls than boys chose football as their motif. On the other hand, no boys chose to draw a handball motif. While two girls did choose riding and dancing motifs, two boys chose skiing and tae – kwon –do. On the other hand, 12/34% preferred to draw other activities that do not involve physical activities such as computer games (5/34), music lessons (5/34) and other motifs (2/34, objects).

1. Discussion

In our findings we saw that very few children are inactive. This does not seem to be how it normally is, both based on other reports and findings on the topic, and also just the brief evaluation of our own logic and their teacher’s comment that the students who were our informants were unusually active. Why could it be that our findings were so opposite of what we expected to find?

First of all, as we have previously mentioned in this report, there are various factors that have an impact on attitude towards physical activity. In this case, one can imagine first of all that the majority of the interviewed children belong to a family of such social status or socio-economic conditions that they both have enough free-time and money to play, be active, and also go to organized physical activity. It is also logical to think that so many of the children walk or bike to school because they live in proximity to the school – as Trondheim consists of many different school circuits/circles where the children attend the school closest to home. Hence very few children live so far away from school that it would be necessary to drive.

In our report we have also mentioned how social relations influence the children’s way of life, so that if friends (or perhaps also others in their surroundings) are engaged in physical activity, they are also encouraged to do so, and the other way around. This became very clear in our study, both in the questionnaires and the drawings. In the results from both the questionnaires and the drawings we have seen that a lot of the students go to handball (mostly girls???) and football (mostly boys???). This gives an indication that these children have had an influence on each other and hence made almost all the students in 5th grade go to organized activities. There is the possibility that the situation could have been the other way around, if physical activity was not popular with the students and thus they would have influenced each other to do more inactive things.

Their overall attitude also gives away that the children – with one exception – do physical activity because they want to themselves – the one exception is “because my mom says so”. We regard this as a positive thing in a long term perspective, because it means there is a bigger probability that they will continue being active – and as we have shown, physical activity counteracts obesity.

#### How did it go with the methods we used for research?

QUESTIONNAIRE

Even though we spent a lot of time making the questions for the questionnaire because we wanted to be sure they were understandable, a lot was misunderstood. For example we thought it would be clear to the children what the difference between unorganized and organized activities is, but quite a few of them didn’t understand the meaning of the word organized even when explained it. Also we asked them in some questions to “give reasons for your answer in the previous question”, a sentence they did not understand even when they were explained it. This means that if we had formulated some of the questions in a different, more understandable way, we would have gotten more correct results.

DRAWINGS

**Other points to discuss**

When a child is involved in organized activity, they are also involved in unorganized activity – meaning that they are overall more active (according to results).

Also it is not the case that those who spend a lot of time on the computer are not active – rather the other way around. Not as we expected.

From Fridah’s part:

Another example is that reported by World Health Organisation (WHO), they note, “There is conclusive evidence that physical fitness and health status of children and youth are substantially enhanced by frequent physical activity” (WHO, 2010:20). The role of physical activity in management of weight and obesity can therefore not be overemphasised. It is important therefore that the attitudes of the children towards physical activity are assessed especially in the current technological age, where lack of time or simply no interest at all are likely to influence these feelings.

- can we discuss something about this?

“Physical activity is categorised at different levels depending on the intensity and these are; low, moderate and vigorous activity.”

* Here we can discuss our division of ph.act into different parts in making the graphs.

# Visual sociology methods for discussion, project report

Challenges for the researchers:

The aesthetic aspect of visual research might rise some questions. The children often enjoy drawing, and therefore may simply want to make a good drawing. For this very reason, researchers involved in visual research not always find the material useful. In our case, this did not occur as a major problem, as the children anyway were drawing an activity. But we can´t be sure *why* the children chose to draw a specific activity. A boy drawing a football scene, might as well draw a computer game scene another day. Similar, a girl drawing a sunbathing scene, might choose to draw a handball match later in the day. The drawing should not be seen as a simple window to the world. It is a human construction and culturally specific, just like a word. Therefore, a drawing is never neutral. Even though it is meant to represent social reality, it is a manufactured object (Thompson 2008:10).It is also important to remember that a drawing - or any image – can be read in several ways. Children may also tend to be reluctant to say anything that in their view may displease the researcher. They also may tend to speak in a particular voice (here: non - verbal) they think is expected from them (Thompson 2008:6). Catherine Burke ( PhD and Senior Lecturer in Education at the University at Leeds) rise the question *what right do we have as adults to know the hidden worlds of children´s culture and to have them illuminate this through visual means?* She argues that we need this access to their knowledge to advocate on their behalf *in order to bring children´s voices more powerfully into the process of policy development* ( Thompson 2008:26).We considered this when we chose our project, as one of the project´s goal is letting children have their say about their physical activities, which we assume is not always the case.

More discussion …………………………………………………………………

Conclusion ……………..

Future perspective ………………………..

1. <http://www.nsd.uib.no/personvern/meldeskjema> [Read January 21st 2013] [↑](#footnote-ref-1)