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Expert in Team Work (Childhood Village)

Project report

Childhood obesity on increase; attitudes toward physical activities
among children

By: The golden age group (Furqan, Fridah, Tadiwos, Tina Louise, Berit
and Christina)

Supervisor: Firouz Gaini

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Key definitions

Agency: the capacity of a child to act in a world.

Attitudes: an expression of favor or disfavor toward a physical activity

Body Mass Index (BMI): a measure of weight-for-height calculated by dividing person's weight in kilograms by the square of his height in meters.

Non-organized physical activity:

Obesity: abnormal or excessive fat accumulation with a body mass index (BMI) greater than or equal to 30

Organized physical activity:

Overweight: abnormal or excessive fat accumulation with a body mass index (BMI) greater than or equal to 25

Physical activity: any force exerted by skeletal muscles that results in energy expenditure above resting level

Physically active:

Physically inactive:

1 Introduction

1.1 Background

Obesity, excess accumulation of fat, is becoming a major global as well as national (Norway) issue not only among adults but also among children escalating the concern about children's health and well-being (Flegal *et al.*, 2006). Childhood obesity is more difficult to define as children are constantly changing weight due to normal growth and development. 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). Conventionally, childhood obesity is defined as the 95th percentile or greater of BMI for age (CDC, 2010).

Obesity is an increasing health problem worldwide, and in our study we are focusing on children. Looking at Europe, the Scandinavian countries have a lower prevalence of obesity compared to the Mediterranean countries, but the prevalence is on the increase also here (Dehghan *et al.*, 2005). A study carried out at the University of Bergen (2010), concluded that 14% of Norwegian children between the ages of 2 and 19 were obese (Juliussen *et al.*, 2010).

Obesity has many medical and non-medical adverse consequences, both at the individual level as well as in the society as a whole. The medical consequences of childhood obesity include cardiovascular complications, metabolic disorders, pulmonary complications, gastrointestinal disorders, and skeletal abnormalities. It is also linked to psychosocial problems such as depression, poor body image, and low self-esteem and confidence (Daniels, 2006; Lee, 2009). Obesity also affects the whole society as it increases the economical expenditures for obesity related medical treatments, and hence the expenditures of the society in general (Finkelstein *et al.*, 2005; Covic *et al.*, 2007).

There are many factors causing obesity, including lifestyle choices such as diet, cultural environment, behavioral and social factors, level of physical activity etc. There can also be genetic causes of obesity, though this is rare (Ebbeling *et al.*, 2002; Dehghan *et al.*, 2005).

Various studies across Europe have shown that physical activity greatly reduces the incidence of obesity. Other studies have shown that several individual factors, including attitude, affect children's participation in physical activity (Cavill *et al.*, 2006). In social studies of children,

they are seen as active participants in society, and children should be viewed as competent individuals able to make decisions about their own life when they are given the necessary information.

1.2 Why “Children’s attitudes 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 the children’s relation to physical activity. Does the increase in childhood obesity mean children are less physically active? Or are they becoming obese because they are less physically active? Or do they/do they not like to participate in physical activity? Or do they want do to more physical activity but they are not able to? Are children spending so much time on the computer? These curiosities and the fact that the trend of childhood obesity is escalating prompted us to think of and assess children’s attitudes towards physical activities by asking them about their reasons for being or not being in physical activity. Assessing the attitude is critical as we can rule out the real motives of children’s towards physical activity.

1.3 Significance of the project

The result of this project can provide information about the children’s attitude towards physical activity filling the knowledge gap in this field. This is very instrumental to design new policies and strategies that increase the participation of children in physical activities at community, society, federation and country level. The study might also come up with justification for the need to consider children as competent individuals and active member of the society that necessitates the active involvement of children in decisions making, maximizing their roles in their own health and other aspects of life. The need to consider children’s attitude will also be a new room to be explored by Norwegian Federation of Sport (NIF) and by Center of Overweight and obesity St. Olav Hospital (RSSO) for effective implementation children’s sport right and developing child obesity treatment and interventions, respectively.

2 Methods

2.1 Quantitative and Qualitative research methods

Any research is essentially communication from the informants or participants (Svennevig, 2001). Selection of particular methods to use and to facilitate this communication is influenced by a lot of different factors, one of which is time. In view of the limited time (3-4 weeks) we had and the nature of the study on attitudes of children towards physical activity, a mixed method procedure, using both qualitative and quantitative methods within the same study was used. Data collection of this study involved 34 children (16 boys and 18 girls) in 5th grade, all aged 10 years.

2.1.1 Questionnaire

To collect quantitative data, a questionnaire was used that addressed the various aspects of everyday life starting with school in the morning to various activities after school in their leisure time. This makes it easier to follow the sequence pattern enabling the children to easily recall what they are involved in. However, misunderstandings can possibly arise both in conversation and in text, but mostly in the latter (Svennevig, 2001). The questions used were at level of the participants (10 years old) knowledge. To ensure validity, there was need to triangulate data by use of a second instrument, the drawings.

2.1.2 Drawings

The other factor to consider in the selection of methods has to do with the target group or research participants. The United Nations Convention on the Rights of the Child (UNCRC) advocates for the rights of children to express themselves and participate in decision – making on matters that affect them (Birbeck and Drummond, 2007). 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. This study used recommended participant friendly methods to ensure children elicit their opinions and perspectives perceptions in different ways as well as their perceptions and thoughts regarded as competent (Birbeck and Drummond, 2007; Thompson, 2008).

The participatory tool used in this pilot project is affording our informants, who are 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.

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. In combination with the questionnaire, it broadened the view and offers opportunity to triangulate the children’s attitudes. As such, use of both qualitative and quantitative methods facilitated proper analysis of results to the question at hand.

2.2 Ethical considerations

When working with children as research participants, 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 this research, the school was informed through both written and verbal communication, and in turn communicated to the parents through E-mails. Apart from the consent of the legal guardians, the participants were informed that they were not obliged to participate. The information sheet given to the guardians also said that the survey was completely anonymous, and it included some information about us, Expert in Team (EiT) and our project. The background for this was NSD’s (Norsk samfunnsvitenskapelig database – Personvernombud for forskning) guidelines for what to include in a consent form¹.

For this project no sensitive information like name, address, or other information was collected to identify the participants. The participants were assured that the information collected was purely for the study. Time limitations did not allow for establishment of a good rapport with the participants and this therefore may have influence on the validity and reliability of the findings as children may say what the researcher wants to hear although the children were assured that there were no wrong answers and they were experts on the matter (Punch, 2002).

¹ <http://www.nsd.uib.no/personvern/meldeskiema> [Read January 21st 2013]

3 Theories

3.1 Medical background of obesity

3.1.1 Definition of childhood obesity

Generally, obesity represents a condition where a pathological excess of body fat is present in an individual (Aycan, 2009). Practically, either BMI or body fat percentages is used to define and to track obesity (Aycan, 2009). 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, a 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, 2012).

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. 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). Likewise, childhood obesity is defined using percentiles of BMI-for-age in a specified reference population rather than fixed BMI values (Flegal *et al.*, 2006). Accordingly, children with BMI 95th percentile or greater are considered as obese and those with BMI between the 85th and 94th percentiles are considered as overweight (CDC, 2010; Speiser *et al.*, 2005).

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).

3.1.2 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 (Aycan, 2009). United States has the highest rate of prevalence of childhood overweight and obesity as compare to other countries (National Obesity Observatory, 2010).

Among European countries, the Scandinavian countries have lower rate of childhood obesity prevalence as compare to Mediterranean countries, but it is increasing also here (Dehghan *et al.*, 2005). Approximately, 30% of Europeans countries are affected by obesity and its development is leveling off (Juliussen *et al.*, 2010). Similarly, the obesity trend in children is rising (Aycan, 2009). 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 (Dehghan *et al.*, 2005).

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 (Aycan, 2009, Juliussen *et al.*, 2010). 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 identified socio-demographic factors such as age, sex, ethnic origin, family size, educational and occupational status of parents as factors that affect the prevalence (Juliussen *et al.*, 2010).

3.1.3 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 *et al.*, 2002; Lee, 2009).

The medical consequences of childhood obesity can be broadly classified into cardiovascular such as hypertension, atherosclerosis, dyslipidaemia, heart disease (such as left ventricular hypertrophy) and stroke), metabolic (such as insulin resistance, the metabolic syndrome and diabetes type 2), pulmonary complications (such as asthma and obstructive sleep apnea), gastrointestinal disorders (such as liver disease and gastroesophageal reflux disease), skeletal abnormalities (such as hip problem and abnormal tibia growth) and others medical complications (such as polycystic ovary syndrome, pseudotumor cerebri, gallstones, arthritis, gout and cancer) (Ebbeling *et al.*, 2002; Daniels, 2006; Health people library project, 2006; Lee, 2009).

The most prevalent complications of obesity are psychological consequences, which involve psychological health and the ability to relate to family members and peers. These include

depression, poor body image, low self-esteem and confidence, reduced health-related physical quality of life, emotional and social aspects (Daniels, 2006; Lee, 2009). 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 as depression itself is often associated with abnormal patterns of eating and physical activity that could result in future obesity (Daniel, 2009). Childhood obesity is also 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; Daniel, 2009).

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).

3.1.4 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 of 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 (Ebbeling *et al.*, 2002; Dehghan *et al.*, 2005).

Genetic factors predispose a child to an obesity-conducive environment. Abnormality in certain genes, such as leptin gene, can directly or indirectly increases the risk factor for developing obesity. 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 (Ebbeling *et al.*, 2002; Health people library project, 2006).

Carbohydrates rich diets, such as bread, ready-to-eat cereals, potatoes, soft drinks, cakes, and biscuits normally provide energy and control appetite. However, 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 (Ebbeling *et al.*, 2002). 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 (Ebbeling *et al.*, 2002; Dehghan *et al.*, 2005; Finkelstein *et al.*, 2005). 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 (Health people library project, 2006).

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 (Health people library project, 2006; Ebbeling *et al.*, 2002; Dehghan *et al.*, 2005). 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 (Ebbeling *et al.*, 2002).

3.2 Physical activity

The significance of physical activity on the general health of the people including children is immense. It is used as a preventive measure in slowing down the progression rate of chronic diseases including heart disease, stroke, diabetes and obesity. It was evidenced that physical activity greatly reduces the incidence of obesity and other non-communicable diseases. Erlichman and others (2002) reported 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.”

According to WHO (2010) report, the physical fitness and health status of children and youth can be substantially enhanced by frequent physical activity. The role of physical activity in management of weight and obesity can therefore not be overemphasized. 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 activities are basically activities that children can be engaged in such as dancing, skipping, brisk walking, jump rope, swimming, cycling, playing football and other games. Physical activity is categorized 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 (Cavill *et al*, 2006).

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. 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 fun 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 (Cavill *et al*, 2006; Haskell, 2009).

3.3 Childhood theories

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. A study conducted in Canada noted:

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 (Santrock, 2004).

Norway is no exception. Juliusson and his colleagues (2010) noted that overall obesity prevalence of primary school children in Norway is of concern. 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 no 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). 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 (2004) defined development as the “pattern of biological, cognitive and socio-emotional changes that begin at conception and continues through the lifespan”. In the biological development, Santrock (2004) noted 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. 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. In the social age notion, “Expectations hinge around when children are seen as having achieved understanding, or competence appropriate to that situation” (Woodhead and Montgomery, 2003). As stated in the National Framework Plan 1996, outdoor activities (“*friluftslivet*”) should be advocated among Norwegians for good overall development of the children. Writing on such practices in the Norwegian culture, Nilsen (2008), pointed out that the top agenda of the government is enhancing children and young people’s opportunities to develop physically, socially and mentally through walking and playing about in, and experiencing nature.

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 referred to Tingstad (2003) and Buckingham & Bragg (2004) who raised 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 and outdoor Norwegian childhood. With such modern influences therefore, it is becoming essential to hear from the children on the matter. 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. Based on Roger Hart’s ladder, (Shier, 2001) participation of the children is at different levels. This starts from listening to them, supporting them, taking their perspectives into account and involving them in decision-making. At all these levels, it is the responsibility of adults to ensure that when children are expressing their views, they must be 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 part, including Norway.

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 that they are being imposed by the adult ideals and are likely to defy the adult authority and take things their own way. In our study of gathering children’s thoughts and feelings, the project recognizes 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. 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” (Shier, 2001). 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.

4 Results

For simplicity and easy comparison purpose, we categorized our results into questionnaires and drawing results.

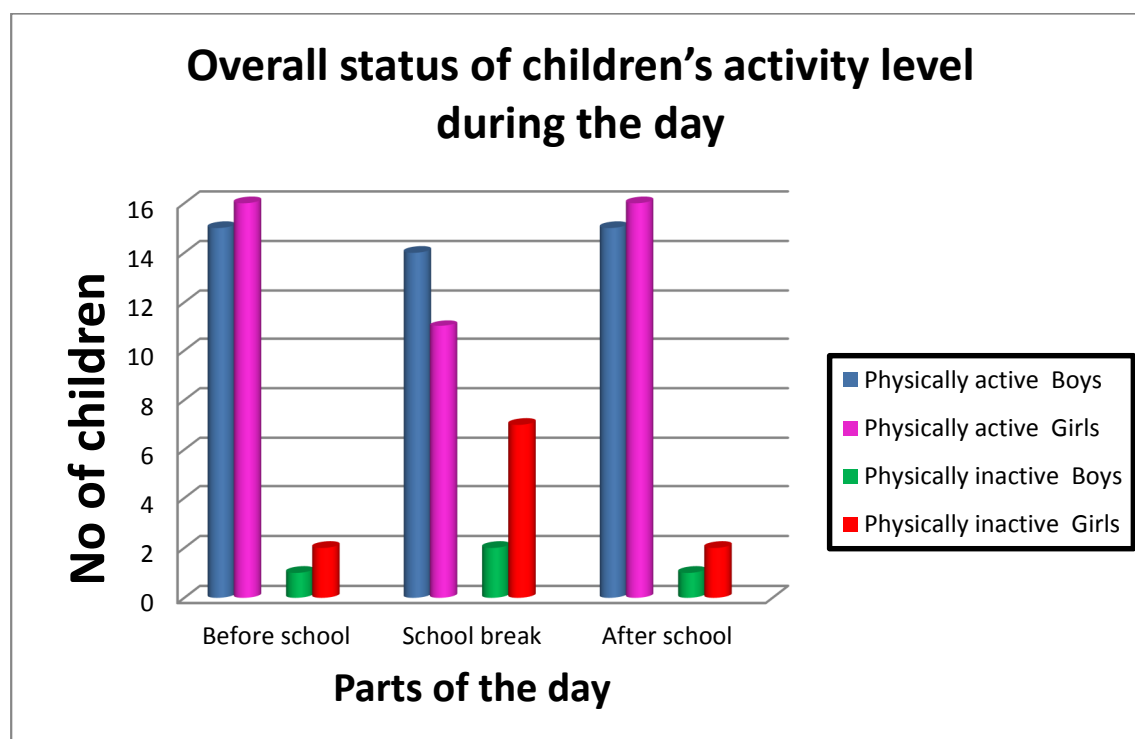
4.1 Questionnaires

In order to investigate childrens attitudes towards physical activity, we have combined some of the answers of the questionnaires and looked at them in relation to others.

4.1.1 Status of children in term of 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 (31 out of 34) were physically active before school, as they walk or ride bike to get to school. Out of physically active children, 16 were girls and 15 were boys. Most of the children (25 out of which 11 girls and 14 boys) answered that they were engaged in different physical activities during the school breaks,

which confirms their physically active status. They involved in activities such as playing with friends, football, "Sura," "Boksen Går," "everything-game," swing, murderer, dance, running around, "Hoppetau", walk around, and basketball. Some children (9 out of 34), however, said that they spent the break doing activities that do not involve physical activity, such as sitting still, thinking and chatting with friends.

31 out of 34 children (16 girls and 15 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 (26 out of which 14 girls and 12 boys) answered that they were involved in both organized and unorganized activities, two girls said that they were involved in organized activity only, and three boys were involved in unorganized activity only.

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

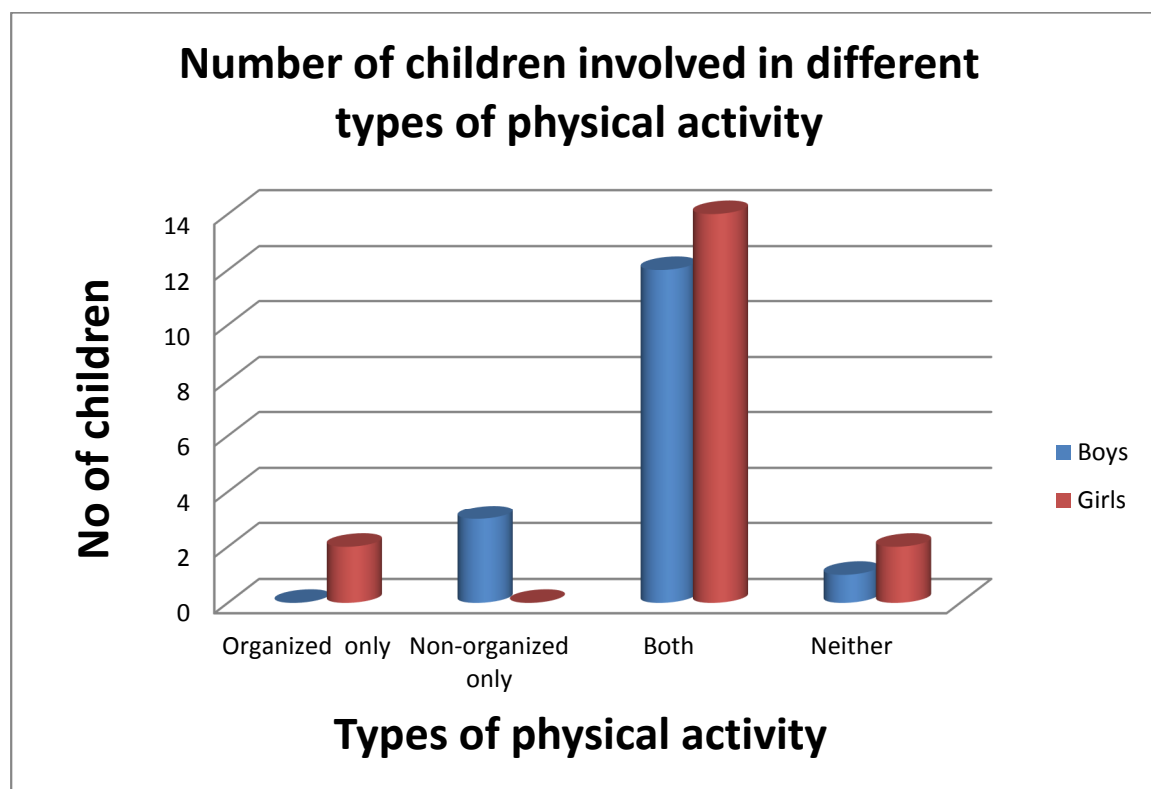
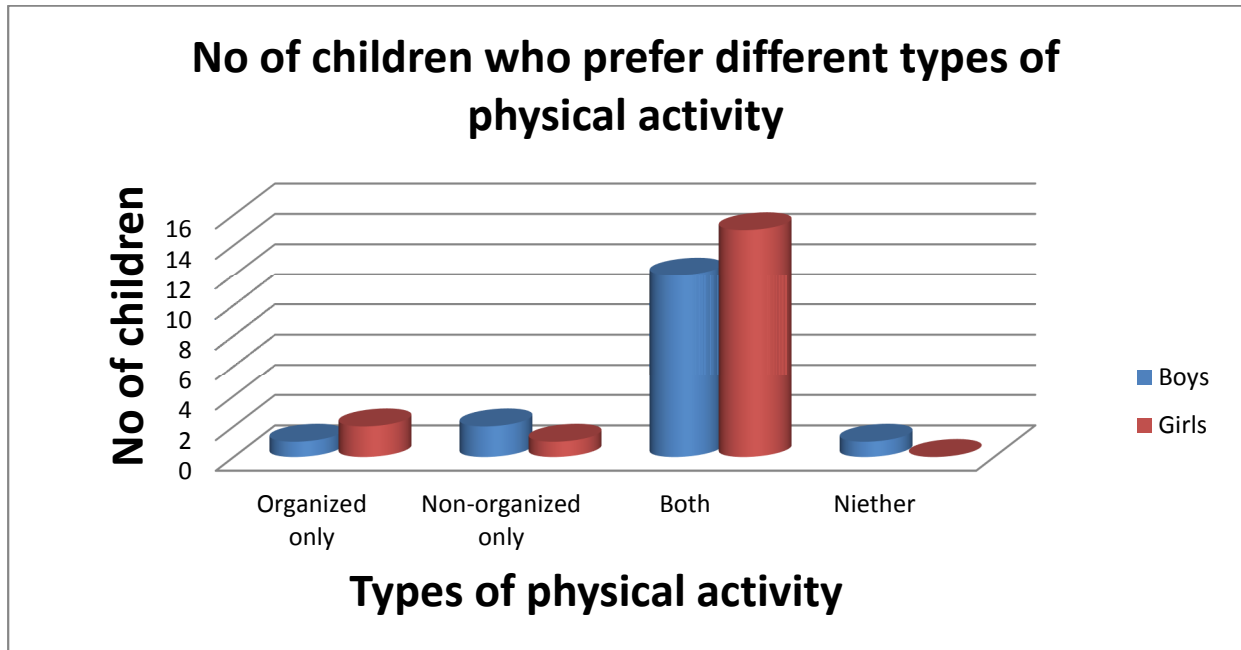


Figure 3 depicts children's attitude towards physical activity based on what kind of physical activity they liked the best. Accordingly 27 (14 girls and 13 boys) out of 34 children answered that they prefer to be involved in both organised and non-organised activities. Three children (2 girls and 1 boy) said that they prefer to be engaged in organized activity

only. Similarly, three children (1 girl and 2 boys) said that they prefer to be engaged in unorganized activity only. Only one boy expressed that he would not like to do any physical activity at all.

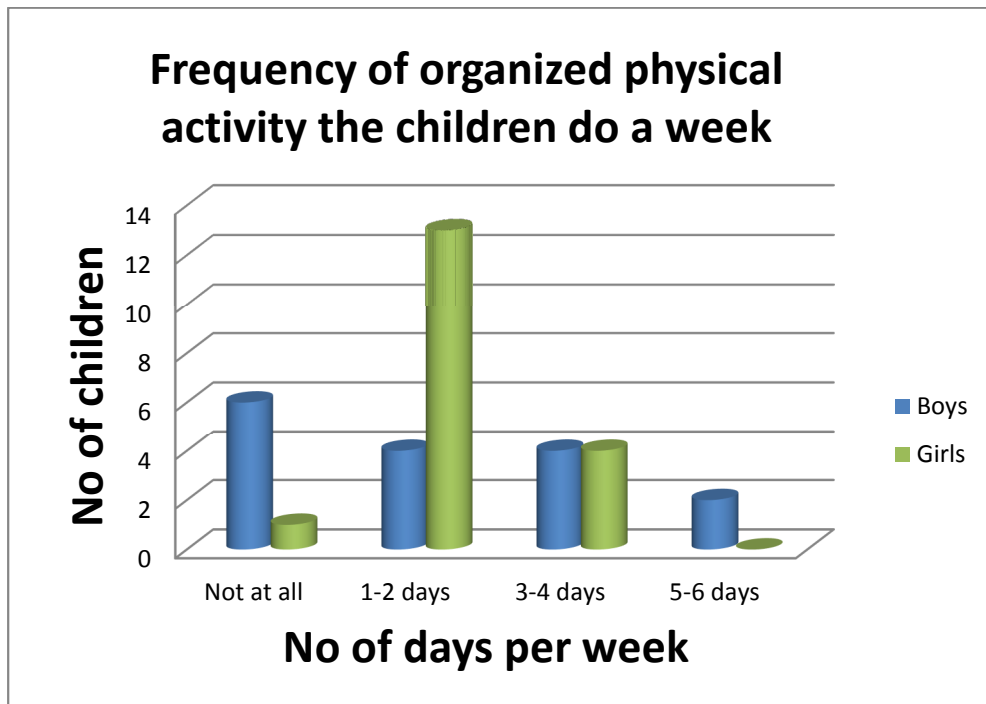
Figure 3: Number of children who prefer different types of physical activity



4.1.2 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. Out of the total participants 17 children (13 girls and 4 boys), 8 children (4 girls and boys) and 2 boys said that they do organized physical activities 1-2 days, 3-4 days and 5-6 days per week. The remaining 7 children (1 girl and 6 boys) picked “not at all” options for how many times they engaged in organized activity in a week.

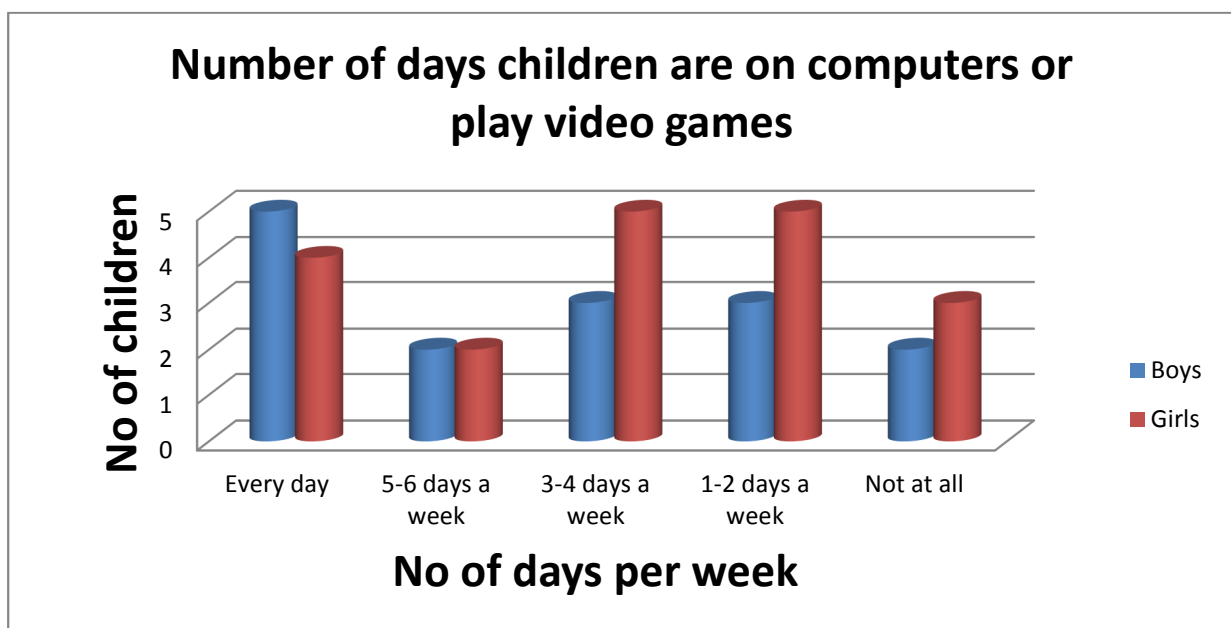
Figure 4: Frequency of organized physical activity the children do a week



4.1.3 Frequency of sitting in front of computer

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

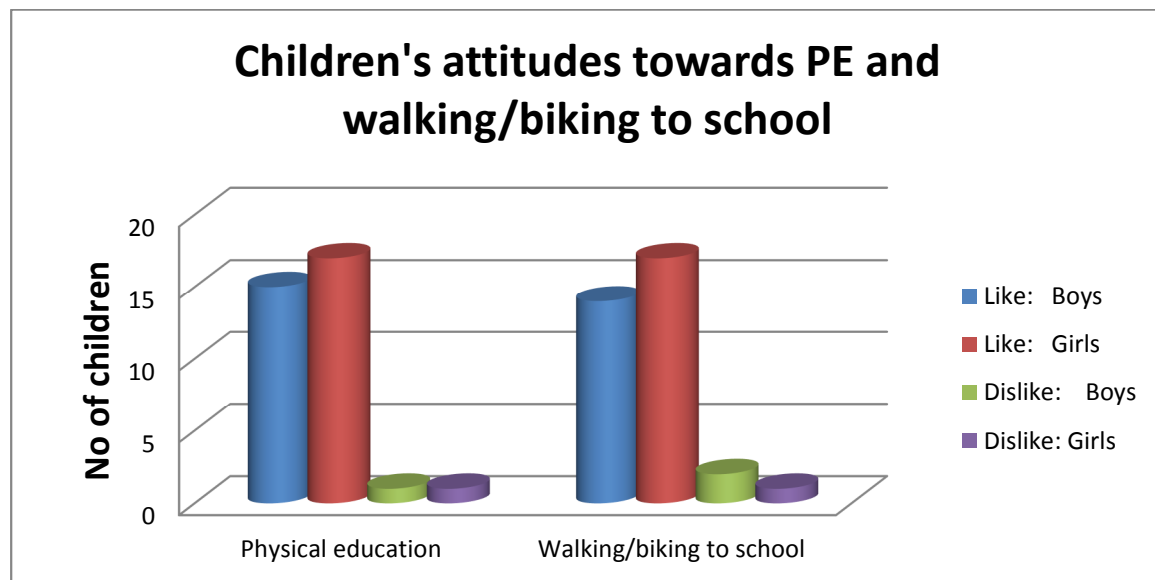
Figure 4: Showing how many days a week the students are using computers or video games.



4.1.4 Attitudes towards physical activity

We also wanted to look at children’s attitudes towards physical education (PE) 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 as a reason for favouring it. Those children who did not like physical education mentioned the tiresome and exhausting nature of it as the main justification for their choices.

4.2 Drawing

The students were asked to draw a detailed drawing describing one particular activity they enjoy doing in their leisure time, physical or not. 22 of the children drew physical activities and out of whom 14 were girls and 8 were boys. 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 taekwondo. On the other hand, 12 out

of 34 children preferred to draw other activities that do not involve physical activities such as computer games (5 children), music lessons (5 children) and other motifs such as objects (2 children). The results of the drawings are summarized in table 1.

Table 2: The activities that the fifth grade students prefer to do during their leisure time

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

5 Discussion

The current rise in cases of obesity among children can be aided by designing appropriate and effective interventions that involve the children themselves.

To promote physical activity as a strategy for control of weight gain and the treatment of obesity in children and adolescents, a better understanding of factors that influence participation in physical activity in youngsters and particularly in those already overweight or obese is important (Deforche *et al.*, 2006).

Such an approach, as employed in this study is assessment of the children's attitudes towards physical activity and understanding of the factors that influence the particular attitudes. The assumption of the study was that the current increase in obesity cases could be influenced by a negative attitude of the children towards physical activity. Ajzen and Fishbein's (1980) emphasised that attitude towards physical activity is an important predictor of engagement in physical activity. It thrives on the basis that intention is an immediate determinant of behaviour and intention in turn is predicted from attitude. Therefore the children's positive or negative evaluation of physical activity has a bearing on the prevention of obesity, with a positive attitude likely to increase engagement in activity while a negative attitude is a predictor of inactivity. Our study indicates that children have a positive attitude towards physical activity, increasing the likelihood of their engagement in it. This attitude therefore shows the willingness as well as competence of the children in the study to take action and make a difference in matters that affect them, in this case, obesity. Interventions can appropriately be designed that promote and enhance this attitude by providing them with the necessary information about the health and psychological benefits of physical activity.

The overall physical activity as reflected in the results section ranges from morning when children have to go to school through to evening and the activities of the children in their free time. In all the cases, the majority of the children is actually involved or indicates preference, a positive attitude, and a predictor of engagement in physical activity. Out of the 34 children in the study only 3 reported to be using the bus or car when going to school. According to Erlichman and others (2002), such purposeful walking and cycling, even if it may be of low intensity type, if done every day, can substantially increase energy expenditure, thus reducing body weight and fat, and in turn incidences of child obesity. The school breaks reflected a similar trend with most of the children (25 out of 34) involved in play that indicated some

form of physical activity through such games as football, 'sura', running around and basketball among others. Most of the physical activities engaged in by the children are group games as also reflected in the drawings on the theme '*My favourite activity*'. This engagement therefore is not entirely due to the physical health benefits that children may be aware of, but also the enjoyment and emotional fulfillment that is gained from it as noted by Cavill *et al*, (2006) and Haskell (2009).

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. Further, Deforche and others (2006) also observed that activities that are too difficult, too boring, not fun and monotonous discourage the children's participation in physical activity. They concluded that activities designed for children should be fun and enjoyable to sustain their interest. The 'fun factor' of a particular activity and its influence on attitude can also be seen from the results of this study in which the number of children involved in physical activity slightly takes a swift turn to the opposite side with 8 children reporting to be involved in physical activity while the rest (26) report to be inactive. This entails that during the holidays, when the children are away from most of their peers, their physical activity decreases, an indication that being with friends in group games greatly influences the children's attitude and highlights the 'fun factor' that peers take away. This is supported by MMWR (2011), who noted that "positive social norms and support from friends and family encourage youth involvement in physical activity."

A positive social norm exists in the Norwegian culture where outdoor life is viewed as the 'normal' and an essential part of a happy, health childhood (Nilsen, 2008). The support from family in this study is clearly visible on the financial aspect, where most of the children in the study are involved in organized physical activity. On the other hand, the high involvement of children in unorganized activity is due to friends' influence during school days and not from parents during the holidays. So, much as the parents offer financial support for organized activity, it is important to sustain the interest of the children in physical activity by modeling it, especially during the children's holidays or free-time. In their study, Sallis *et al* (2000) found that parental physical activity showed a positive association with their children's physical activity. The teachers as well should be role models in the school and not just the coaches especially that the children spend much of their time there.

Further, indications of physical activity are the responses the children give, for question on PE. Out of the 34 participants, only 2 reported to dislike it and this is further substantiated by the drawings in which the majority of them reflect a motif of physical activity as their favourite. Some of the reasons for liking PE included having 'fun', 'chance to get out of class', 'improve shape and be more active' as well as 'working out muscles' among others. This shows that the children have expert knowledge on matters that affect them and all that has to be done is to enhance it. As an intervention for example, health education in schools and communities can integrate the expertise of the children to disseminate health information by door- to- door or street walk campaigns and afford them opportunity to practice healthy behaviour by physically being involved. In such a case, their participation according to Shier's (2001) ladder is not just at level of being listened to, but being taken as active participants capable of influence for the better on the matter of child obesity. In such a case, the children are able to exercise agency (James, 2009).

However, much as the attitudes of the children are positive, and may entail a strong physical activity preference amongst them, the findings do not correlate with the current increase of obesity cases for children. As stated earlier, to explain the increasing cases of obesity the survey expected a negative attitude towards physical activity among children, yet this was not so. One explanation for this is that "physical activity is a complex behaviour determined by many factors" (Sallis *et al.*, 2000) within society. One such factor is the self-reporting of involvement in physical activity by the children. In this survey, very few children reported to be inactive. This could be a case of over-reporting (Kristoffersen and Simonsen, 2012). The Norwegian culture expects one to be active and like outdoor activities. It is possible that some participants reported to be active just to be "correct" and true to the expected norm even, if they are not actually involved in physical activity. Sallis and others (2000), report that; "studies that use self -reporting measures, usually find more physical activity than those that use objective measures." This study is one such case.

Moreover, even those children involved in physical activity may not be reaching the recommended standard that reduces levels of obesity. "Weight gain occurs when persons expend less energy through physical activity than they consume through their diet" (MMWR, 2011). Due to various limitations (listed below), this study was unable to measure physical activity in its entirety, especially in terms of time spent on it and its intensity. Though the children mentioned a lot of games (like handball, basketball and football) that are physical

and the majority of them (22) are active at least for 1-4 days in a week, it is difficult to tell how intense the activities are. The same goes for the duration of the exercise. For example, WHO (2006), recommends that, a moderate –intensity physical activity should accumulate 60 minutes per day in order to offset the rise in obesity cases. It is likely that these expected standards are not being met. In other studies, similar situations of the children and young people not meeting the recommended standards are reported (Sallies *et al.*, 2000; MMWR, 2011).

Another factor that can explain the rise in obesity cases is the competition for time between physical activity and computer games or internet. In what they call ‘discourse of worry’ Tingstad (2003) and Buckingham and Bragg (2004) in Nilsen (2008) fear that modern Norwegian childhoods are associated with negative influences and sedentary indoor leisure pursuits. Although the participants in the study report a positive attitude towards physical activity, they also use computers. Though the duration per day is not known, 21 participants spent time before the screen for 3 or more days in a week. Out of these 9 did so, on a daily basis. So, even though the children report to be active, it depends on the balance that they strike between time before the screen and that of physical activity. Sallis and others (2000) note;

Although time spent watching T.V. is generally unrelated to activity levels, use of after school and weekend time for sedentary pursuits, was a consistent correlate for many children. This identifies sedentary behaviours as competitors for child’s time and help to explain why interventions to decrease sedentary time result in activity.

The cause for worry with ‘screen time’ is the indirect influence that it has on the children’s health. Firstly, if too much time is spent before a screen, it means less energy is being expended. This is worsened with especially snacking during viewing as large quantities of calories are taken in without realising. This therefore puts one at risk of gaining weight and eventually developing obesity.

Other contributing factors to the rise in obesity can be the physical environment in which the children are found. For example, due to urbanisation, escalators have replaced stair ways, therefore promoting an inactive lifestyle. But in order to defeat obesity, WHO advocates for active living, in which physical activity is integrated in daily routines. Since obesity has

multiple causes, it is important that all are addressed with the emphasis on health diet and physical activity of moderate intensity, consistent and of the right type.

Our study also documented that girls were more physically active and had better attitudes than boys. These findings are in consistent with the Europe-WHO (2009) Fact sheet, which reported that a greater prevalence of overweight and obesity in boys than girls. However, these findings are on contrary to a study from the University of Bergen which reported that higher prevalence of obesity in Norwegian girls than boys involved in the study (Juliusson *et al.*, 2010). Taken together, it appears that girls are more physically active that might be because of their positive attitudes toward physical activity as evidenced by the fact that girls spent less time in front of computer and said they more like PE and walking/biking to school than boys.

6 Limitations of the study

The main limitations of our study include limitation related to the sample size and representativeness of the sample, questionnaires, time and absence of direct measurement of obesity

Small sample size and less representative sample. In this study, 34 (10 years old) children were included that is small sample size as well as less representative influencing our data and conclusion as inclusion of more children at different age level will be vital to come up with a strong evidence about the overall attitudes of children towards physical activity.

Questionnaire: despite the maximum care taken to simplify the questionnaires to children's level of understanding, there were some misunderstanding of some questions and confusions among children. In addition, some general questions were asked that need to be specified in order to have a clear picture about the physical activity status of the children. Moreover, the group faced a lot of difficulties in organizing and analyzing the answers from questionnaires that might be because of lack expert in statistics in the group.

Time: During data collection, we requested the children to draw whatever they want with the limited time bound that might affect their thinking or attitudes towards drawing. Thus, several drawing activities should be done to catch their real attitudes.

Lack of direct measurement of obesity: We were only looking at attitudes, and did not do any measurements that indicate the weight status of the children. We can therefore not conclude that a positive attitude leads to less obesity, or that children with negative attitudes were more obese.

7 Future perspectives

Others studies should be done on childhood obesity taking the limitations of this study into account. There is a need to educate the people by conducting health awareness programmes in schools as well as in society about how obesity develops? How it leads to other health related problems? What are its consequences?

Based on our findings we recommend that designing and implementing new policies that increase children's participation in sports should consider children's attitudes. Similarly, developing and evaluating obesity treatment and interventions (by the Center of Overweight & obesity St.Olav Hospital (RSSO)) should take the attitudes of the children into account.

8 References

- Ajzen I, Fishbein M (1980) Understanding attitudes and predicting social behavior. Englewood Cliffs, NJ: Prentice-Hall. PP 561.
- Aycan Z (2009) Obesity in Childhood: definition and epidemiology. *J Clin Res Ped Endo* 1:44–53.
- Birbeck J, Drummond MJN (2007) Research with young children: contemplating methods and ethics in: *Journal of Education Inquiry* 7: 21-27.
- Cavill N, Kahlmeier S, Racioppi F (2006) WHO Library Cataloguing in Publication Data Physical activity and health in Europe: evidence for action.
- Clark A (2005) Ways of seeing: using the Mosaic approach to listen to young children's perspectives In: Clark A, Kjørholt & Moss P. *Beyond Listening: Children's Perspectives on Early Childhood* Bristol: The Policy Press.
- Center for disease control and prevention (2010) Basics about Childhood Obesity. Growth charts.
- Covic T, Roufeil L, Dziurawiec S (2007) Community beliefs about childhood obesity: its causes, consequences and potential solutions. *Journal of Public Health* 29: 123–131.
- Creswell JW (2003) *Research Design: Quantitative, Qualitative, and Mixed Methods Approaches*. SAGE. Thousand Oaks. USA.
- Daniels SR (2006) The Consequences of Childhood Overweight and Obesity. In: *Childhood Obesity*. McLanahan S, Haskins R, Paxson C, Rouse C, Sawhill I eds. The Woodrow Wilson School of public and international affairs at Princeton University and the Brookings institution 16: 3-47.
- Deforche BI, De Bourdeaudhuij IM, Tanghe AP (2006) Attitude towards physical activity in normal-weight, obese and adolescents. *Journal of Adolescent Health* 38:560-568.
- Dehghan M, Akhtar-Danesh N, Merchant AT (2005) Childhood obesity, prevalence and prevention. *Nutrition Journal* 4:1-8.

Ebbeling CB, Dorota B Pawlak, David S Ludwig (2002) Childhood obesity: public-health crisis, common sense cure. *The LANCET* 360: 473-482.

Erlichman J, Kerbey AL, James WPT (2002) Physical activity and its impact on health outcomes. Paper 2: prevention of unhealthy weight gain and obesity by physical activity: an analysis of the evidence. *Obesity reviews* 3:273–287.

Finkelstein EA, Ruhm CJ, Kosa KM (2005) Economic causes and consequences of obesity. *Annual Review of Public Health* 26:239–57.

Flegal KM, Tabak CJ, Ogden CL (2006) Overweight in children: definitions and interpretation. *Health Education Research Theory and Practice* 6: 755–760.

Haskell WL, Blair SN, Hill JO (2009) Physical activity: Health outcomes and importance for public health policy. *Preventive Medicine* 49:280–282.

Health people library project (2006) obesity. American Association for the Advancement of Science (AAAS) New York.

James A (2009) Agency In: quortrup J, Corsaro WA, Honig MS eds. *The Palgrave Handbook of childhood studies*. London, Palgrave.

James A (2009) *European Childhoods. Cultures, Politics and Childhoods in Europe*. London: Palgrave.

Johnson J (2008) Methods, tools and instruments for use with children In: *Young lives- An international study of childhood poverty*.

Júlíusson PB, Eide GE, Roelants M, Waaler PE, Hauspie R, Bjerknes R (2010) Overweight and obesity in Norwegian children: prevalence and socio-demographic risk factors. *Acta Pædiatrica* ISSN 0803–5253, DOI:10.1111/j.1651-2227.2010.01730.x.

Lee YS (2009) Consequences of Childhood Obesity. *Ann Acad Med Singapore* 38:75-81.

MMWR (2011) *Centres for Disease Control and Prevention: Recommendations and Reports* Vol.60. No. 5.

Mei Z, Grummer-Strawn LM, Pietrobelli A, Goulding A, Goran MI, Dietz WH (2002) Validity of body mass index compared with other body-composition screening indexes for the assessment of body fatness in children and adolescents. *The American Journal of Clinical Nutrition* 75:978-985.

Nilsen RD (2008) Children in nature: Cultural ideas and social practices in Norway. In: Allison James, Adrian James (eds) *European Childhood: Culture, Politics and Childhoods in Europe*, pp. 38–60. Basingstoke: Palgrave Macmillan.

National obesity observatory (2009) international comparisons of obesity prevalence.

Punch S (2002) Research with children, the same or different from research with adults? In: *Childhood* 9(3) 321-341.

Sallis JF, Prochaska JJ, Taylor WC (2000) A review of correlates of physical activity of children and adolescents. *Medicine and Science in Sports and Exercise* 32:963-975.

Santrock JW (2004) *Physical and Cognitive Development*. www.mcgrawhill.ca

Shier H (2001) A new model of enhancing children's participation in decision –making in line with Article 12.1 of the United Nations Convention on the Child's Rights. *Children and Society* Vol. 15.

Speiser PW, Rudolf MC, Anhalt H, Camacho-Hubner C, Chiarelli F, Eliakim A, et al., (2005) Childhood obesity. *The Journal of Clinical Endocrinology and Metabolism* 90:1871-87.

Svennevig J (2001). *Språklig samhandling. Innføring i kommunikasjonsteori og diskursanalyse*. Oslo: Cappelens Forlag AS.

Thomson P (2008) *Doing visual research with children and young people*. London: Routledge. PP 8-14.

Thompson P, Gunther H (2007) *The methodology of students-as-researchers: valuing and using experience and expertise to develop methods*. Taylor & Francis Group

World Health Organization (2010) *Global Recommendations on Physical Activity for Healthy* Geneva.

World Health Organization (2012) Obesity and overweight. Fact sheet N°311.

Woodhead M, Montgomery H (2003) Understanding Childhood: An interdisciplinary approach Chichester: John Wiley.

Tingstad (2003)

Buckingham and Bragg (2004)

Kristoffersen and Simonsen (2012)