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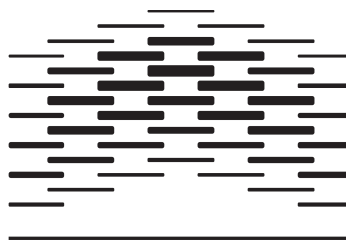
Dietary behaviors, corresponding correlates and socioeconomic differences among adolescents

A cross-sectional study among 8th graders in Øvre Romerike

The ESSENS study

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This master thesis is part of the ESSENS study that was a collaboration between Oslo and Akershus University College and Folkehelsenettverk Øvre Romerike. This study has been an exciting, educational and challenging experience, and we are grateful for the opportunity to be part of an inspiring project group.

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Oslo, May 2016

Jorun Utne and Elisabeth Hurum

Collaboration

This master thesis is a collaboration between Elisabeth Hurum and Jorun Utne. Both master students have contributed equally in all practical and written work related to the thesis. The chapters are written in close collaboration, where both master students have contributed equally.

Summary

Background: Overweight and obesity among children and adolescents are a global health challenge. Prevention in adolescence is of particular concern, since behaviors as young can track into adulthood. Consumption of fruit, vegetables, unhealthy snacks and soft drinks with sugar are important behaviors in preventing overweight, and are all found to be unfavorable among adolescents. Identifying potential correlates is important from a health promotion perspective. Further, children with lower socioeconomic position have more unhealthy diets than their counterparts. Exploring factors responsible for these socioeconomic differences is vital in order to address these differences.

Aim: The first aim is to describe dietary behaviors (intake of fruit, vegetables, unhealthy snacks and soft drinks with sugar) and explore their potential correlates (perceived accessibility at home, perceived parental rules, perceived parental modeling and self-efficacy for healthy eating) among 8th graders in Øvre Romerike. The second aim is to explore socioeconomic differences in these behaviors and potential mediating effects of the correlates.

Methods: A cross-sectional study among 728 8th graders (participation rate 64%) was conducted in Øvre Romerike, by using an electronic questionnaire. Parental educational level was used as indicator of socioeconomic position. Gender differences in dietary behaviors were explored using independent sample t-test. Multivariate linear regression was used to explore potential correlates of dietary behaviors. One-way ANOVA was used to explore differences in dietary behaviors and in correlates of dietary behaviors among the parental educational groups. Multiple mediation analysis was conducted to explore correlates' potential mediating effect on socioeconomic differences in soft drink consumption.

Results: The 8th graders mean intake of fruit, vegetables and unhealthy snacks was 6.9, 8.7, and 4.5 times per week, respectively. The mean intake of soft drinks was 7.0 dl per week, and was the only dietary behavior which differed significantly between genders and between socioeconomic groups. Boys and the low parental educational group had the highest intake of soft drinks. Accessibility, self-efficacy for healthy eating and parental modeling were associated with all the dietary behaviors. In addition, prohibitive rules were also significantly related to intake of unhealthy snacks and soft drinks. Accessibility, prohibitive rules and parental modeling mediated parental educational differences in soft drink intake.

Conclusion: The results highlight the importance of the home environment for all the dietary behaviors included. Adolescents' self-efficacy for healthy eating was also important for

making healthy choices. Parents have an important role to play in the improvement of socioeconomic differences in soft drink consumption by reducing accessibility of soft drinks in the home environment, practice more prohibitive rules and by modeling more healthy behavior.

Key words: Dietary behaviors, correlates, socioeconomic position, parental educational level, mediation, adolescents, Øvre Romerike.

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Abbreviations

ANOVA:	Analysis of variance
CCA:	Cronbach's coefficient alpha
CI:	Confidence interval
ENERGY:	European Energy balance Research to prevent excessive weight Gain among Youth
ESSENS:	Environmental determinantS of health behaviorS among adolEsceNtS
FAS:	Family affluence scale
FFQ:	Food frequency questionnaire
FV:	Fruit and vegetables
FØR:	Folkehelsenettverk Øvre Romerike
HBSC:	Health behavior in School aged Children
HEIA:	HEalth In Adolescents
ICC:	Intra-class correlation coefficient
MeSH:	Medical subject headings
NCDs:	Non-communicable diseases
SCT:	Social cognitive theory
SD:	Standard deviation
SEP:	Socioeconomic position
SPSS:	Statistical package for the social sciences
SDH-perspective:	Social determinants of health-perspective
UNICEF:	United Nations Children's Fund
WHO:	World Health Organization

1.0 Background

The growing prevalence of overweight and obesity among children and adolescents is of great health concern (European Union, 2014; Lobstein, Baur, & Uauy, 2004; Ng et al., 2014). Overweight and obesity increase the risk of non-communicable diseases (NCDs), such as diabetes, hypertension, cardiovascular diseases and some cancers (Lobstein et al., 2004; World Health Organization, 2004), which is considered to be the leading causes of death worldwide (World Health Organization, 2014). Poor diet, sedentary lifestyle and lack of physical activity are important factors contributing to the increasing prevalence of obesity, and are also directly associated with several risk factors of NCDs, such as high levels of cholesterol, high blood pressure and abnormal glucose tolerance (World Health Organization, 2004). Obesity and poor health behaviors developed during childhood is of great concern since these behaviors may track into adulthood, and contribute to higher obesity rates and poorer health (Craigie, Lake, Kelly, Adamson, & Mathers, 2011; Juhola et al., 2011; Lien, Lytle, & Klepp, 2001; Rasmussen, Holstein, & Due, 2012). Therefore, promoting a healthy diet and regular physical activity during childhood and adolescence are of great importance to prevent overweight and chronic diseases as adults, as well as contribute to healthy development and growth (Boeing et al., 2012; Malik et al., 2010; World Health Organization, 2004).

Dietary behaviors among children and adolescents in Europe have been found to be unfavorable, and consumption of fruit, vegetables, unhealthy snacks and soft drinks with sugar is a particular challenge (Diethelm et al., 2012). Several European countries have noticed a positive trend in consumption of these food items among adolescents the past decade, but intake is still not satisfactory (Fismen et al., 2016; Vereecken et al., 2015). The consumption of fruit and vegetables (FV) is below dietary recommendations (Bjelland et al., 2011; Fismen et al., 2016; Hilsen, Stralen, Klepp, & Bere, 2011; Lynch et al., 2014; World Health Organization, 2016; Yngve et al., 2005), where large proportions of European adolescents do not eat fruit and vegetables on a daily basis (Diethelm et al., 2012; Vereecken et al., 2015; World Health Organization, 2016). Consumption of soft drinks with sugar and unhealthy snacks has on the other hand been documented to exceed dietary recommendations (Brug et al., 2012; Diethelm et al., 2012; World Health Organization, 2016). Further the age period from 11 to 15 is a time where adolescents go through many physical, social and

developmental changes, which may lead to poorer dietary behaviors (Story, Neumark-Sztainer, & French, 2002; Verloigne, van Lippevelde, Maes, Brug, & De Bourdeaudhuij, 2012; World Health Organization, 2012), which also makes adolescents an important group for health promotion.

Dietary behaviors are a product of multiple influences, which can mainly be divided into individual and environmental determinants (Glanz, Rimer, & Viswanath, 2008).

Environmental determinants can be categorized as physical, economic, political or sociocultural (Swinburn, Egger, & Raza, 1999). The home environment includes several determinants, and has shown to play a more prominent role in dietary behaviors among children and adolescents in comparison to school, neighborhood or societal factors (de Vet, de Ridder, & de Wit, 2011). Home environmental determinants can include familial influence, rules related to food consumption, availability and accessibility of food (Rasmussen et al., 2006; Sleddens et al., 2015; van der Horst et al., 2007b). Potential individual determinants of adolescents' dietary behaviors can be nutrition knowledge, taste preference, self-efficacy for healthy eating, subjective norm, attitude and intention (McClain, Chappuis, Nguyen-Rodriguez, Yaroch, & Spruijt-Metz, 2009; Sleddens et al., 2015). There are also several socio-demographic determinants that may play an important role in influencing dietary behaviors, like age, gender and socioeconomic position (SEP) (Rasmussen et al., 2006).

Social inequality in health exists in most countries, including Norway. Health and life expectancy improves with increasing level of socioeconomic position, also called the social gradient in health (Dahl, Bergsli, & van der Wel, 2014). Socioeconomic position has shown to have an impact both on dietary behaviors, and on different determinants of dietary behaviors (Kirby, Baranowski, Reynolds, Taylor, & Binkley, 1995), where children with parents who have lower socioeconomic position are at higher risk of having a poorer diet, and becoming overweight and obese (Moore & Cunningham, 2012; Shrewsbury & Wardle, 2008; Stalsberg & Pedersen, 2010; Zarnowiecki, Dollman, & Parletta, 2014). These socioeconomic differences appear in consumption of fruit, vegetables, fiber rich foods, high-fat foods and sweetened beverages (Brug, 2008; Pearson, Biddle, & Gorely, 2009; Rasmussen et al., 2006; Stephens, McNaughton, Crawford, MacFarlane, & Ball, 2011; Zarnowiecki et al., 2014). The underlying mechanisms of the socioeconomic differences in dietary behaviors are however not well understood, and there is need for a greater understanding of the potential drivers of

these mechanisms (Pikhart, Ruiz, Morrison, Goldblatt, & Marmot, 2014; Zarnowiecki et al., 2014).

There are inconsistent findings in how strongly different determinants influence dietary behaviors among adolescents. In addition, there is lack of knowledge of these behaviors among adolescents in Norway. Further, exploring differences in potential determinants of dietary behaviors between socioeconomic groups might provide a greater understanding of these socioeconomic differences (Zarnowiecki et al., 2014). This master thesis therefore aims to describe dietary behaviors and explore potential determinants among adolescents in Øvre Romerike¹. Further, the aim is to explore socioeconomic differences in these behaviors, and potential mediating effects of these socioeconomic differences.

This master thesis is part of a larger research project, the ESSENS study (Environmental determinantS of health behaviorS among adolESceNtS). The study was a collaboration between Oslo and Akershus University College of Applied Sciences and the public health project in Øvre Romerike: Folkehelsenettverk Øvre Romerike (FØR). The main goal of the ESSENS study was to describe dietary behaviors, physical activity and sedentary behaviors, and to identify potential environmental- and individual determinants of these behaviors among adolescents in Øvre Romerike. Four master students participated in the study, where two master students did qualitative research and two master students did quantitative research. This thesis is part of the quantitative part in the ESSENS study and was written by two master students. This thesis investigated selected dietary behaviors and potential home environmental- and individual determinants of the dietary behaviors among the adolescents. The included dietary behaviors were intake of fruit, vegetables, unhealthy snacks and carbonated soft drinks with sugar. The included potential correlates were perceived accessibility of food at home, perceived parental rules related to food consumption, perceived parental modeling and self-efficacy for healthy eating. The study had a cross-sectional design, and the term correlates will therefore be used to describe the potential determinants, as the statistical analysis will not be able to identify causal inferences (Bauman, Sallis, Dziewaltowski, & Owen, 2002).

¹ A district in Akershus County, including the six municipalities; Hurdal, Eidsvoll, Nannestad, Ullensaker, Nes and Gjerdrum.

2.0 Objectives

The main objective of this master thesis was to describe dietary behaviors and explore potential correlates of these dietary behaviors among 8th graders in Øvre Romerike. Further the aim was to explore socioeconomic differences in dietary behaviors and factors explaining these differences. The specific objectives of the thesis were:

- To describe dietary behaviors (fruit, vegetables, unhealthy snacks and soft drinks with sugar) among 8th graders in Øvre Romerike
- To explore whether perceived accessibility at home, perceived parental rules, perceived parental modeling and self-efficacy for healthy eating are correlates of the dietary behaviors
- To assess the association between parental educational level and the dietary behaviors and their potential correlates
- To explore if a potential association between parental educational level and the dietary behaviors is mediated by the potential correlates

3.0 Theoretical background

3.1 Dietary behaviors among adolescents

A healthy and adequate diet is known to be important to prevent and reduce the risk of weight-gain and NCDs (Nasjonalt råd for ernæring, 2011; Nordic Council of Ministers, 2014; World Health Organization, 2013). A healthy diet is high in fiber, low in fat, with high consumption of fruit and vegetables, reduced intake of added sugar and less frequent snacking (Nasjonalt råd for ernæring, 2011; World Health Organization, 2003). Existing data show an overall positive trend in Norwegian adolescents' food behaviors between year 2001 and 2014, with increased consumption of fruit and vegetables, and decreased consumption of sweets and soft drinks (Fismen, Smith, Torsheim, & Samdal, 2014; World Health Organization, 2016). However, studies indicate that Norwegian adolescents do not meet national dietary recommendations in relation to fruit and vegetables, and preferably should reduce intake of soft drinks with sugar and unhealthy snacks (Fismen et al., 2016; World Health Organization, 2016). The positive trend also seems to be reduced as the adolescents become older (World Health Organization, 2012). Existing data show that Norwegian adolescents engage in more unhealthy dietary behaviors in relation to fruit, vegetables, soft drinks and unhealthy snacks from the age of 11 to 13, and additionally to the age of 15 (World Health Organization, 2016).

3.1.1 Fruit and vegetables

Fruit and vegetables are key components of a healthy diet (Nordic Council of Ministers, 2014; World Cancer Research Fund & American Institute for Cancer Research, 2007; World Health Organization, 2009), and promotes optimal health, growth and intellectual development during childhood (World Health Organization, 2012). FV have a high content of micronutrients, dietary fiber and potential bioactive constituents. Most fruits and vegetables also have a low energy density and can displace the consumption of energy-dense snacks, which may contribute to weight maintenance (Nordic Council of Ministers, 2014; World Cancer Research Fund & American Institute for Cancer Research, 2007). A low fruit and vegetable intake is one of the most important risk factors of cardiovascular deaths (World Health Organization, 2009). Strong scientific evidence has proven fiber-rich plant foods, like fruit and vegetables, to decrease the risk of several NCDs (Boeing et al., 2012; Nasjonalt råd for ernæring, 2011; Nordic Council of Ministers, 2014). The World Health Organization (WHO) recommends eating a minimum of five portions, or 400 grams, of fruit and vegetables per day (World Health Organization, 2003), but this recommendation is not met globally

(World Cancer Research Fund & American Institute for Cancer Research, 2007). Norwegian dietary guidelines also recommend five portions of FV per day, where each portion is set to be 100 grams. It is further recommended that half of the intake should be vegetables (Helsedirektoratet, 2014).

In Ungkost, a Norwegian national representative survey from 2000, the average intake of fruit and vegetables among 8th graders were 255 grams, which included potatoes, berries and juice (Øverby & Andersen, 2002). Ten percent of the 8th graders reached the recommended intake of 500 grams of FV a day (Øverby & Andersen, 2002). A collaborative cross-national survey, Health Behavior in School aged children (HBSC), track changes among 11, 13 and 15 year-old adolescents in relation to health and wellbeing, included dietary behaviors (World Health Organization, 2012). Trend data in the HBSC study from 1985 to 2000 showed a decrease in fruit consumption among Norwegian 8th graders, but an increase was seen from 2001 to 2005 (Samdal et al., 2009). The HBSC study from 2009/2010 showed that 46% and 36% of Norwegian 13 year-old girls and boys ate fruit on a daily basis (World Health Organization, 2012). In the HBSC study from 2013/2014 these percentages had decreased to 38% and 34% for girls and boys respectively (World Health Organization, 2016). The HEalth In Adolescents study (HEIA) was a school based two-year intervention study aiming to promote optimal weight development in Norwegian adolescents. The study was conducted from 2007 to 2009 and followed 11 year-old students to the age of 13 (Lien et al., 2010). Results from the control group are presented in this master thesis. The HEIA study showed that the average frequent intake of fruit among 13 year-olds was 9.6 times a week, and intake of vegetables was 10.5 times a week (Bjelland et al., 2015).

3.1.2 Unhealthy snacks and carbonated soft drinks with sugar

A concern about food and beverages high in sugar and low in nutrients, is that they may replace other more nutrient rich foods, or they may be consumed in addition to healthier foods, and therefore increase overall energy intake (Malik, Pan, Willett, & Hu, 2013; Vartanian, Schwartz, & Brownell, 2007). Unhealthy snacks such as chocolate, sweets and biscuits, fatty and salty snacks are low in nutrients and high in energy (Nordic Council of Ministers, 2014). These food items often have a high content of added sugar, fat and salt, and are associated with increased risk of weight gain, obesity and chronic diseases (Nordic Council of Ministers, 2014). Soft drinks with added sugar are nutrient-poor and high in

energy (Nordic Council of Ministers, 2014), and is associated with increased energy intake, overweight and NCDs (Malik et al., 2013; Nordic Council of Ministers, 2014; Te Morenga, Mallard, & Mann, 2013; World Health Organization, 2012). There have however been some inconsistent findings in the association with soft drinks with sugar and overweight (Forshee, Anderson, & Storey, 2008; Haug et al., 2009). High soft drink consumption is also associated with a lower intake of milk, calcium and other nutrients, in addition to increased risk of dental erosion (Li, Zou, & Ding, 2012; Vartanian et al., 2007). It is recommended that added sugar does not exceed more than 10%, and preferably not more than 5%, of total energy intake (Nordic Council of Ministers, 2014; World Health Organization, 2015). Nordic nutrition recommendations suggests that saturated fat should be limited to less than 10% of the energy intake, and dietary intake of trans fatty acids should be as low as possible. Furthermore, it is recommended not to exceed six grams of salt a day (Nordic Council of Ministers, 2014).

The Ungkost study, from 2000, showed that 18% of the total energy intake among Norwegian 8th graders came from added sugar (Øverby & Andersen, 2002). Mean intake of soft drinks was close to three deciliter, and boys had a higher consumption than girls. Mean intake of sweets was approximately 40 grams a day, and girls had a higher intake than boys (Øverby & Andersen, 2002). Chocolates and sweets were among the most important foods contributing to saturated fat intake among 8th graders in 2000 (Øverby & Andersen, 2002). Trends from the HBSC survey showed an increase in consumption of sweets from 1985 to 2000 among Norwegian 8th graders, but a decrease was found from 2001-2005 (Samdal et al., 2009). Results from a cross-sectional study comparing consumption of sugar-sweetened beverages among Norwegian 11 to 12 year-olds, indicated a reduction in consumption from 2001 to 2008 (Stea, Overby, Klepp, & Bere, 2012). In the HBSC survey from 2010, 8% of Norwegian girls and 10% of Norwegian boys consumed sugar-sweetened beverages on a daily basis (World Health Organization, 2012). The HBSC survey from 2013/2014 showed that these percentages decreased to 4% and 7% for girls and boys respectively (World Health Organization, 2016). Results from the HEIA study in 2009 showed that the 13 year-olds had an average soft drink intake of six deciliter per week (Bjelland et al., 2015).

3.2 Theoretical frameworks

In public health promotion, it is necessary to identify risk behaviors that lead to poorer health as well as factors that influence these behaviors (Brug, 2008). Several theoretical frameworks have been developed to better understand the mechanisms that influence human behavior. The health belief model, the theory of planned behavior, the social cognitive theory (SCT) and the social-ecological model are examples of different theories and models that contribute to develop hypothesis and seek explanations for how different factors influence human behavior (Nutbeam, Harris, & Wise, 2010). In the past decade there has been a paradigm shift in studies regarding diet and dietary determinants. From a large focus on individual determinants there is a stronger emphasis on environmental determinants, thus a greater consideration of the social-ecological approach (Sleddens et al., 2015). The interaction between personal, environmental and behavioral factors and how these influence human behavior is also acknowledged, which can be explored in the social cognitive theory (Ball et al., 2009; Pearson, Ball, & Crawford, 2012).

The social-ecological model

The ecological model of health behaviors emphasizes that health behaviors are influenced by multiple levels (Sallis, Owen, & Fisher, 2008). The model focuses both on individual and environmental determinants of health, as well as the interaction between the two (Reynolds, Klepp, & Yaroch, 2004). Most commonly the model is divided into five levels: intrapersonal, interpersonal, organizational, community, and policy (McLeroy, Bibeau, Steckler, & Glanz, 1988; Sallis et al., 2008). Determinants of behaviors at the intrapersonal level include biological and psychological factors, for example attitudes, knowledge, skills, intention and self-efficacy. The interpersonal level consists of social and cultural influences, such as different social networks, which include family, neighbors, friends and peers. Home environmental determinants like availability and accessibility of food, regulation of food and parental modeling can be included in this level. On the organizational level there are influences from institutional factors like schools, workplaces etc. Determinants in the school environment can be school rules and regulation related to dietary behaviors. The community level includes relationships and informal networks among these organizations and institutions. Finally, there is the policy level consisting of local and national laws and policies that may influence human behaviors (McLeroy et al., 1988). Influences at the different levels of the social-ecological model interact with each other. Physical environments and sociocultural

factors cut across these levels, and may influence them all (McLeroy et al., 1988; Sallis et al., 2008).

The ESSENS study was based on the social-ecological model, including political, environmental, interpersonal and individual factors influencing dietary behaviors, mainly in the school- and home environment. In this master thesis the focus was on home environmental correlates of dietary behaviors: perceived accessibility, parental rules and parental modeling, as well as one individual correlate: self-efficacy for healthy eating. The home environment with accessibility of food, rules related to food consumption and parental modeling can be placed in the interpersonal level in the social-ecological model. Self-efficacy for healthy eating can be placed in the intrapersonal level in the social-ecological model. Banduras social cognitive theory provides a framework that can be used in the intra- and interpersonal level of the social-ecological model, to explore the correlates in the present thesis. The SCT can help to understand how behavioral, cognitive and environmental correlates interact and influence human behavior. However, the focus in this master thesis will not be on the interaction of the behavioral, cognitive and environmental correlates, but how different cognitive and environmental correlates can influence dietary behaviors.

The social cognitive theory

The social cognitive theory has a focus on psychosocial influences while including environmental factors. The SCT is an interactional model of causation where personal, behavioral and environmental influences interact with each other and determine human behavior (Bandura, 1986). The key concepts of the SCT can be grouped into five categories with influencing factors: psychological determinants of behavior, observational learning, environmental determinants of behavior, self-regulation and moral disengagement (McAlister, Perry, & Parcel, 2008). These different influences may not have equal strength, and they may not necessarily occur simultaneously (Bandura, 1986).

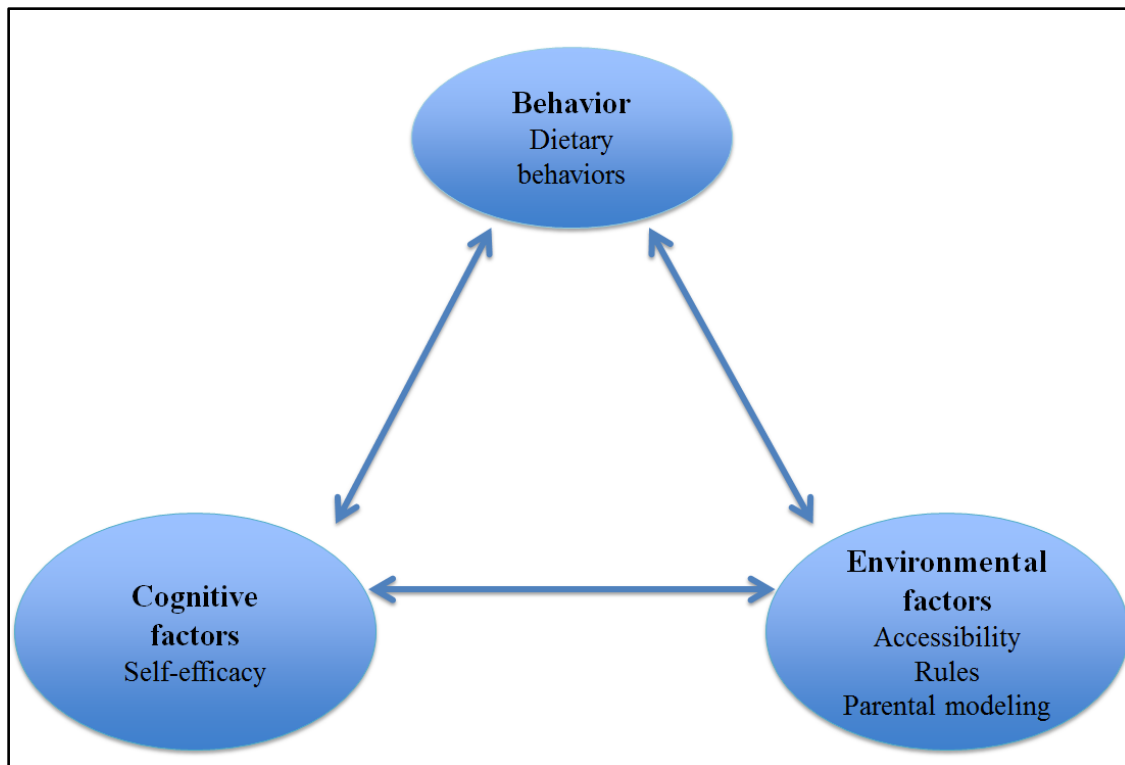


Figure 1: A model of the social cognitive theory including the dietary behaviors and potential correlates explored in this master thesis, adapted from Bandura, 1986 (Bandura, 1986).

The category of psychological determinants of behavior includes the determinants outcome expectations, self-efficacy and collective efficacy (McAlister et al., 2008). According to Albert Bandura a person's beliefs about his capacity to influence events affecting his life and how well he can do this, referred to as self-efficacy, may be the most important personal determinant of behavior (Bandura, 1986). Self-efficacy can mediate the relationship between knowledge and action. Further, Bandura explains how people do not always act or behave as they know they should, because they think they lack the capability to behave that particular way (Bandura, 1986).

The second category, observational learning, is also central to the SCT. Observational learning includes four processes: attention (observing), retention (when the behavior is memorized), production (performance of behavior), and at last motivation, which is determined by outcome expectations (Bandura, 1986). How parents modeling influence their children's food behaviors can be an example of observational learning.

The social cognitive theory also recognizes the strong influence of environmental determinants, and hypothesizes that observational learning will not lead to behavioral change unless the environment surrounding the observer supports the behaviors. Key concepts of environmental determinants are incentive motivation and facilitation (McAlister et al., 2008). Incentive motivation is a way to try modifying a behavior by providing rewards or punishments for behaviors that are desired or undesired. Facilitation is a way to influence a behavior through changing the environment so it becomes easier to perform a certain behavior (Bandura, 1986). Rules related to food consumption, e.g. prohibitive and permissive rules, as well as making healthy food more accessible, can be ways of facilitating the environment for more healthy food behaviors.

The two last categories within SCT are self-regulation and moral disengagement. Self-regulation is concrete skills a person has to manage himself and influence his own behavior. This can be done through goal-setting, self-instruction, feedback, self-monitoring, self-reward and enlistment of social support (McAlister et al., 2008). Moral disengagement can be explained as a process where a person convinces himself that ethical standards do not apply for him in a specific context (McAlister et al., 2008). The social cognitive theory is broad, and seeks to give explanations for almost all human phenomena (Bandura, 1986). This master thesis looks into behaviors that can potentially be explained by the three first key concepts in the theory: psychological determinants of behavior, like self-efficacy; observational learning, like parental modeling; and environmental determinants of behavior, like accessibility of food at home and rules related to food consumption.

3.2 Correlates of dietary behaviors among adolescents

3.2.1 Accessibility of food at home

Accessibility of food at home is an environmental factor that can influence adolescents' food behavior, and has been identified as an important correlate positively associated with food intake (Hilsen et al., 2011; Rasmussen et al., 2006). Availability relates to the presence of food in the environment, while accessibility relates to factors that contribute to how easy the food is to consume, such as the form and location of the foods (Zarnowiecki et al., 2014). Fruit and vegetables may be more accessible after some preparation, such as washing and

cutting (Zarnowiecki et al., 2014). Another example can be unhealthy snacks or soft drinks, which are more accessible when served, compared to only being present in the home.

3.2.2 Rules related to food consumption

Rules related to food consumption can be permissive, by encouraging food intake, or prohibitive, by restricting or limiting intake (Sleddens, Gerards, Thijs, de Vries, & Kremers, 2011). Parents play an influential role for their children's eating behaviors (Brug, 2008; de Vet et al., 2011; Scaglioni, Arrizza, Vecchi, & Tedeschi, 2011; Zarnowiecki et al., 2014). In addition to being in charge of the home food supply, parents monitoring and parental practice can be important factors influencing their children's eating behaviors (Zarnowiecki et al., 2014). Examples of parental monitoring and practice can be encouraging food variety or controlling intake of unhealthy food (Sleddens et al., 2011). A review of the literature indicates that children raised in authoritative homes eat more healthily compared to children raised in homes where parents practice more permissive rules for unhealthy behaviors or are more uninvolved in their children's dietary behaviors (Sleddens et al., 2011). There is for example found a positive association with permissive parenting style and intake of soft drinks with sugar (Verloigne et al., 2012).

3.2.3 Parental modeling

Modeling is related to observational learning in which the behavior of a human being acts as a stimulus for similar behavior in another human being (Bandura, 1977). Parental modeling has shown to be an important determinant for children and adolescents dietary behaviors, as parents strongly influence their children's dietary habits (Berge, 2009; Brug, 2008; de Vet et al., 2011; McClain et al., 2009; Pearson et al., 2009; Zarnowiecki et al., 2014). A healthy diet in children and adolescents has been related to if their parents have a high intake of healthy food, like fruit and vegetables, and a low intake of less healthy food, like snacks and soft drinks (Cislak, Safron, Pratt, Gaspar, & Luszczynska, 2012; McClain et al., 2009). The most consistent association found is between parental intake and children's intake of fruit and vegetables (Berge, 2009; McClain et al., 2009; Pearson et al., 2009; Rasmussen et al., 2006; van der Horst et al., 2007b). There is also found a positive association between parental intake and adolescent's fat and energy intake, as well as for soft drink consumption (McClain et al., 2009; van der Horst, Kremers, et al., 2007a; van der Horst et al., 2007b).

Parental modeling related to dietary behaviors in children and adolescents has been referred to as both modeling, perceived modeling, parental intake and parental eating behaviors (Cislak et al., 2012; de Vet et al., 2011; McClain et al., 2009; Pearson et al., 2009; Rasmussen et al., 2006; Sleddens et al., 2015; van der Horst et al., 2007b; Zarnowiecki et al., 2014). Further, adolescents' perceived modeling has been more consistently associated with dietary behaviors, compared to parents' own reports on modeling (McClain et al., 2009).

3.2.4 Self-efficacy

Self-efficacy is not the skills a person posits, but a persons' judgment of what one can do with own skills (Bandura, 1986). In relation to dietary self-efficacy, it can be described as a person's own beliefs to be able to choose healthy foods in challenging circumstances, for example if one feels unmotivated, or if healthy choices are limited (Pearson et al., 2012). It is further shown that adolescents' healthy food choices are associated with their self-efficacy for making healthy choices (Cusatis & Shannon, 1996; Kristjansdottir et al., 2006). Self-efficacy has been associated with behaviors to such a high extent that assessing correlates of behaviors without including self-efficacy can be considered incomplete (Sallis et al., 2008).

3.3 Socioeconomic position and social inequalities in health

Norwegian children and adolescents have good health (Meld. St. nr. 34 (2012-2013), 2013). There is however an association between social inequality and infants, children and adolescents' health in Norway, as in other countries (Næss, Rognerud, & Strand, 2007; Pikhart et al., 2014). Health inequalities are observed within most of the indicators of socioeconomic position as well as within many different health outcomes (Dahl et al., 2014). A framework aiming to explain social inequalities in health highlights five central causal mechanisms: social stratification, differential exposure, differential vulnerability, differential disease consequences, and disease consequences for the individual and for society (Comission on Social Determinants of Health, 2008; Diderichsen et al., 2012). The framework aims to better understand "the causes of the causes" (Comission on Social Determinants of Health, 2008). *Social stratification* concerns the hierarchy of the socioeconomic positions in society, including education, heritage, age, ethnicity and health, which are created by society itself. These influences early in life have great impact on the child's future opportunities and for

health later in life. *Differential exposure* highlights the varying degree of the exposure of risk factors, through the environment, such as work, economic circumstances, and physical environment, among others (Diderichsen et al., 2012). Children spend a considerable amount of their time in the home environment. In relation to children's dietary behaviors may socioeconomic differences in factors influencing these behaviors be of particular importance (Zarnowiecki et al., 2014). Socioeconomic differences in parents' health knowledge and norms can for example contribute to higher exposure of unhealthy foods in the home environment. *Differential vulnerability* emphasizes how causes of illnesses may act more synergistically in lower socioeconomic groups, due to a higher exposure for different risk factors, therefore making these groups more vulnerable. *Differential disease consequences* concern how socioeconomic position influences one's ability to cope after injury or illness. *Disease consequences* may be severe for individuals as it has an impact on the further course of illness and therefore contribute to increase social inequality (Diderichsen et al., 2012).

The perspective of the social determinants of health, the SDH-perspective, is also developed to understand the prevalence and development of social inequalities in health, and serve as a tool to equalize social inequalities (Dahl et al., 2014). The SDH-perspective is a result of decades of research and has contributed to identify the social determinants of health; education, income, occupation, social relations and housing conditions (Dahl et al., 2014). Education and income are among the most applied indicators of SEP, and is considered to be strongly related to dietary behaviors (Holmboe-Ottesen, Wandel, & Mosdøl, 2004). Most adolescents are still in school, do not have much economic power, do not work and lack occupational status, therefore parental socioeconomic position most often is the proxy for adolescents' socioeconomic position (Currie et al., 2008).

Education

Education is an important precondition to enter and stay in the job market, and income and job options are strongly determined by educational level (Diderichsen et al., 2012). Parental educational level is an important indicator of children and adolescents' socioeconomic position, and is found to be the indicator with the most consistent findings with diet and dietary correlates (Nilsen, Krokstad, Holmen, & Westin, 2010; Rasmussen et al., 2006; Zarnowiecki et al., 2014). Educational level may be an indicator of parents' capacity to

access, interpret and practice health information, which can influence the precondition and terms for health throughout adolescence (Ball & Crawford, 2006).

3.4 Dietary behaviors and correlates of dietary behaviors in association with socioeconomic position

Evidence shows that socioeconomically disadvantaged children are at higher risk of having more unhealthy dietary behaviors than children from more affluent families (Brug, 2008; Zarnowiecki et al., 2014). Considering that the drivers of these socioeconomic differences are not well understood, it is important to identify determinants of dietary behaviors and differences in these determinants between socioeconomic groups (Ball et al., 2009; Zarnowiecki et al., 2014). Research shows an association with parental SEP and adolescents' intake of fruit and vegetables, non-core foods and sweetened beverages (Pearson et al., 2009; Rasmussen et al., 2006; Zarnowiecki et al., 2014). There is also an association between socioeconomic position and availability and accessibility of food at home, children's nutrition knowledge and parental modeling. It is found that parents with higher education model healthier behaviors, and adolescents from high-income families experience stronger parental modeling towards healthy eating (Ball et al., 2009; Bere, van Lenthe, Klepp, & Brug, 2008b; Zarnowiecki et al., 2014). Self-efficacy for healthy eating has also been associated with socioeconomic position, where children with a lower socioeconomic background have lower self-efficacy for increasing fruit intake and reducing intake of junk food (Ball et al., 2009). Parental feeding practices, including rules related to food consumption, have however shown indeterminate associations with socioeconomic position (Cardel et al., 2012; Hupkens, Knibbe, van Otterloo, & Drop, 1998).

4.0 Subjects and methods

4.1 Study design

This master thesis is part of the ESSENS study, which was conducted during November-December 2015.

4.1.1 The ESSENS study

The ESSENS study was a school-based study, aiming to map dietary behaviors, physical activity, sedentary behaviors and corresponding correlates among adolescents in the 12 secondary schools in Øvre Romerike. The study was divided into a quantitative and a qualitative part, and consisted of a project group with four researchers and four master students.

The quantitative part of the study was a cross-sectional study including all 8th graders in Øvre Romerike, and is the basis for this master thesis. The two master students writing this thesis planned and conducted the recruitment and data collection of the quantitative part. They also contributed in the preparation of information material and fact sheets that were sent to school leaders, principals, parents and students, and also assisted in the development of the questionnaire. The qualitative part included six of the twelve schools. The qualitative part consisted of focus group interviews with 9th grade students and interviews with a school administrator and a teacher in "food and health" at each school, and was conducted by the two other master students in the ESSENS study.

4.2 Literature search

A systematic literature search was conducted in order to review the literature on the topics of the thesis: dietary behaviors, determinants of dietary behaviors and social inequalities in health among adolescents. Relevant MeSH-terms were detected using the Karolinska institute search page for MeSH-terms in prior of the literature search (Karolinska Institutet, 2016). Both MeSH-terms and other terms were used in the search. The literature search was done in two databases; PubMed and Food Science source, as they were considered to be the most relevant databases of these topics. MeSH-terms and key terms of the following topics were detected: social inequalities in health, dietary behaviors, determinants of dietary behaviors,

target group, dietary behaviors of fruit, vegetables, unhealthy snacks and soft drinks, and for the specific determinants; accessibility, rules, parental modeling and self-efficacy.

4.3 Development of questionnaire

The questionnaire used in the study was developed by a researcher in the ESSENS study, after review of the literature. Questions with evidence of reliability and/or validity were either adapted or modified from previous studies. The two master students contributed to the development of the questionnaire. They gave feedback on questions they thought should be included, as well as changes they believed were necessary. They translated original English questions to Norwegian, and adapted some of the questions to a Norwegian context. The statement on how easy it is to consume three fruits and four vegetables a day was as an example changed to five fruit and vegetables a day. Finally, the master students developed the electronic format of the questionnaire using the online survey tool; LimeSurvey 2.05+ (LimeSurvey, 2016).

The questionnaire of the ESSENS study included questions regarding dietary behaviors, physical activity, sedentary behaviors, as well as several potential correlates of these behaviors. The questionnaire also included questions on breakfast habits, school food environment and socio-demographic characteristics. In this thesis, questions on socio-demographic characteristics, dietary behaviors (fruit, vegetables, unhealthy snacks and soft drinks with sugar) and potential correlates of these dietary behaviors (accessibility, rules, parental modeling and self-efficacy) were used to answer the objectives. These variables will therefore be further explained. The items used in the master thesis are attached in appendix 1.

4.3.1 Variables

Socio-demographic characteristics used in this master thesis were age, gender, ethnicity and parental educational level. The dietary behaviors studied were intake of fruit, vegetables, unhealthy snacks and carbonated soft drinks with sugar. Correlates of the dietary behaviors were perceived home accessibility, perceived rules related to food consumption, perceived parental modeling and self-efficacy for healthy eating. The dietary behaviors were chosen because they have been identified to be among the most important contributors to youths'

health, as well as in the prevention of overweight and NCDs (Brug et al., 2012; Diethelm et al., 2012; Nordic Council of Ministers, 2014; Vereecken et al., 2015; World Health Organization, 2012). The correlates of the dietary behaviors were chosen because they have shown to have strong associations with adolescents' dietary behaviors (Berge, 2009; Brug, 2008; de Vet et al., 2011; McClain et al., 2009; Pearson et al., 2009; Rasmussen et al., 2006; Sallis et al., 2008; Sleddens et al., 2011; Zarnowiecki et al., 2014). These correlates also have shown to be of importance in relation to socioeconomic differences (Zarnowiecki et al., 2014). Further, there are few studies regarding dietary behaviors, corresponding correlates, as well as their association with socioeconomic position in Øvre Romerike and Norway, which demonstrates the need for studies on these topics in this area.

Socio-demographic characteristics

Gender was assessed by a question with two answer categories; girl or boy. In relation to age, the 8th graders were asked for year and month of birth. The age of the adolescents was then calculated based on the question for age and for the time of data collection (December 2015). The 8th graders were also asked if they were born in Norway or another country, and answered the same question for their mother and father. A participant was then considered ethnic minority if both parents were born outside Norway (Lie, 2002).

Parental educational level

The 8th graders socioeconomic position was assessed by parental educational level, as it is the indicator with most consistent findings in relation to dietary correlates (Rasmussen et al., 2006; Zarnowiecki et al., 2014). One or two parents reported parental educational level by answering the questions in the parental informed consent; "What is the relation this guardian has to the participating child in this survey?" and "What is this guardian's highest educational level?". The first question had six answer categories; Mother of the child, father of the child, stepmother of the child, stepfather of the child, legal female guardian or legal male guardian of the child. All answer alternatives were categorized into either female guardian or male guardian, which represents the mother or the father of the child. The second question on parental educational level had five answer categories ranging from less than seven years of education to more than 16 years of education. The parent with the highest educational level,

or the one available, was used for the analyses. Based on categories from Statistics Norway, the parental educational level was categorized into three levels; Low (≤ 12 years), medium (13-16 years) and high (> 16 years) (Rognan & Barrabés, 2001). The three levels of SEP were chosen based on the known gradient in health inequalities (Dahl et al., 2014).

Dietary behaviors

Fruit consumption

Intake of fruit was assessed from one question on frequency of consumption. The question included intake of fresh fruit; “How often do you usually eat fresh fruit?”. The question had eight answer categories from never/seldom to three times or more per day. The variable on intake of fruit was recoded to times per week.

Vegetable consumption

Intake of vegetables was assessed through two questions on frequency of consumption; “How often do you usually eat raw vegetables (e.g. carrot, tomato, salad)?” and “How often do you usually eat cooked vegetables (not potatoes)?”. The questions on intake of vegetables had eight answer categories from never/seldom to three times or more per day. The two questions on intake of vegetables were combined to one variable, and were then recoded to times per week.

Unhealthy snacks consumption

Intake of unhealthy snacks was found through three questions on frequency of consumption; “How often do you usually eat chocolate, candy or ice cream?”, “How often do you usually eat fatty snacks (e.g. potato chips, salted peanuts)?” and “How often do you usually eat sweet biscuits, buns, muffins and similar sweets?”. All questions on intake of unhealthy snacks had seven answer categories from never/seldom to two times or more per day. The questions on intake of unhealthy snacks were combined to one variable. The variable was recoded to times per week.

Soft drinks with sugar consumption

Intake of carbonated soft drinks with sugar, hereunder referred as soft drinks, was found through questions on frequency and amount of consumption on weekdays and one question on amount of consumption during weekends. The question measuring frequency of consumption on weekdays was; “On weekdays (Monday to Friday), how often do you drink carbonated soft drinks with sugar (e.g. Cola, Solo)?”. The question measuring frequency on weekdays had six answer categories from never/seldom to every weekday. If students answered that soft drinks with sugar was consumed one day per week or more, the participants were asked about amount of consumption on weekdays; “When drinking carbonated soft drinks with sugar on weekdays, how much do you usually drink each time? (1/2 liter = 3 glasses)”. The question had four answer categories from 1 glass to 4 glasses or more. Intake of soft drinks with sugar during weekends was found through one question on amount of consumption; “In the weekends, how much do you usually drink of carbonated soft drinks with sugar (e.g. Cola, Solo)? (1/2 liter = 3 glasses) Add up what you drink on Saturday and Sunday”. This question had eight answer categories from never/seldom to 7 glasses or more. The questions on intake of soft drinks with sugar were combined to one variable. The variable on intake of soft drinks was recoded to deciliter per week.

All questions on dietary behaviors were adapted from the HEIA study (Lien et al., 2010). A test-retest study of the questionnaire used in the HEIA study indicated that the questions had an acceptable to good reliability, with Pearson’s test-retest correlation coefficients that ranged from 0.46 to 0.78 (Bjelland et al., 2011). The questions on fruit and vegetables also showed satisfactory validity by using a 7-day food record as reference method (Haraldsdottir et al., 2005). The questions assessing intake of soft drinks with sugar have been validated among 9 and 13 year-olds by using a 4-day pre-coded food diary as reference method, and moderate Spearman’s correlation coefficients were obtained (Lillegaard, Øverby, & Andersen, 2012).

Correlates of dietary behaviors

Perceived accessibility

Perceived accessibility at home, hereunder referred as accessibility, of fruit, vegetables, unhealthy snacks and soft drinks with sugar was assessed by asking how much the 8th graders agreed or disagreed with different statements. Answer categories ranged from 1 (strongly

disagree) to 5 (strongly agree) with a neutral midpoint. The statements on soft drinks with sugar had a sixth answer category; Do not have carbonated soft drinks with sugar at home (=0). All statements began with; "At home..".

Accessibility of fruit was assessed using a 3-item scale, with the following statements; "there is usually fruit I like accessible", "we vary the fruit we have during the week" and "my mother and/or father usually cuts up fruit I can eat between meals". Accessibility of vegetables was assessed using a 4-item scale with following statements; "we usually have vegetables for dinner every day", "we vary the type of vegetables served for dinner during the week", "we vary the preparation of vegetables served for dinner during the week" and "there usually are vegetables I like accessible". Accessibility of unhealthy snacks was assessed using a 3-item scale with the three statements; "there usually is sweet or fatty snacks I like accessible", "we usually have sweet or fatty snacks served as dessert or snacks on weekdays" and "we usually have sweet or fatty snacks served as dessert or snacks in the weekends". Accessibility of soft drinks with sugar was assessed using a 3-item scale with the statements; "there usually is carbonated soft drinks with sugar accessible", "we usually have carbonated soft drinks with sugar at dinner on weekdays" and "we usually have carbonated soft drinks with sugar at dinner in the weekends".

The scales of perceived home accessibility of vegetables and soft drinks with sugar were adapted and modified from the Family and Dietary habits project (F&D) (Bjelland et al., 2014). Content validity of the scales was tested by an expert panel in the F&D project and found to be moderate (Bjelland et al., 2014). Test-retest reliability was also found to be moderate (unpublished data). The scales of accessibility of fruit and unhealthy snacks were modified from these questions. The scale of accessibility of fruit was given an additional statement relevant for fruit; "At home my mother and/or father usually cuts up fruit I can eat between meals". Cronbach's coefficient alpha (CCA) was used to assess the internal consistency of these scales in the ESSENS study. Accessibility of fruit, vegetables and soft drinks had acceptable CCA's ranging from 0.56 to 0.75, and accessibility of unhealthy snacks had a moderate value of 0.42.

Perceived parental rules

Perceived parental rules, hereunder referred as parental rules, related to intake of fruit, vegetables, unhealthy snacks and soft drinks with sugar was assessed by asking how much the 8th graders agreed or disagreed with different statements. The statements had five or six answer categories on a 5- or 6-point scale. The answer categories went from strongly agree to strongly disagree with a neutral midpoint. The statements on soft drinks with sugar had a sixth answer category; Do not have carbonated soft drinks with sugar at home (=0). The parental rules were divided into permissive rules for fruit and vegetable intake, and prohibitive rules for unhealthy snacks and soft drinks intake. A high score within rules for fruit and vegetables mean that the adolescents have high permissive rules and are encouraged to eat fruit and vegetables. A high score within rules for unhealthy snacks and soft drinks mean that the adolescents have high prohibitive rules, meaning strict rules regarding consumption of unhealthy snacks and soft drinks. All statements began with; "At home..".

Parental rules for fruit intake were assessed using a 2-item scale with the statements; "I can eat fruit whenever I want to" and "I can eat as much fruit as I please". Parental rules for vegetable intake were assessed using the same statements for vegetables. Parental rules for intake of unhealthy snacks were assessed using the statement; "when we have sweet or fatty snacks available, I can eat whenever I want to". Parental rules for intake of soft drinks with sugar was assessed using a 4-item scale with the statements; "we have rules for when I can drink carbonated soft drinks with sugar", "we have rules for how much carbonated soft drinks with sugar I can drink", "I can drink carbonated soft drinks with sugar whenever I want to" and "I can drink as much carbonated soft drinks with sugar as I please".

The questions on parental rules related to consumption of vegetables and soft drinks with sugar were adapted and modified from the Family and Dietary habits project (Bjelland et al., 2014). Content validity of the scales was tested by an expert panel in the F&D project and found to be moderate (Bjelland et al., 2014). Test-retest reliability was also found to be moderate (unpublished data). The questions on parental rules related to intake of fruit and unhealthy snacks were modified from the questions on parental rules related to vegetable intake. CCA was used to assess the internal consistency of the scales measuring parental rules for intake of fruit, vegetables and soft drinks in the ESSENS study, and ranged from 0.66 to 0.86. Parental rules related to intake of unhealthy snacks were assessed using a single-item question.

Perceived parental modeling

Perceived parental modeling, hereunder referred as parental modeling, of fruit, vegetables, unhealthy snacks and soft drinks with sugar was assessed by asking how much the 8th graders agreed or disagreed with different statements.

Parental modeling of fruit and vegetable intake was assessed using the statements; “my mother eats fruit every day” and “my mother eats vegetables every day”. The same statements were given for fathers. The statements had five answer categories on a 5-point scale ranging from 1 (strongly agree) to 5 (strongly disagree) with a neutral midpoint. These questions were adapted and modified from the Pro-Children study (De Bourdeaudhuij et al., 2005). A validation study conducted a test-retest of the reliability of the scales in six European countries among 10 and 11 year-old adolescents. The intra-class correlation coefficient (ICC) was 0.63 for parental modeling of vegetable intake (De Bourdeaudhuij et al., 2005). In the same validation study the ICC was 0.68 for the questions on parental modeling of fruit intake. The only change made from the initial questions was removal of a sixth answer category; “I don't have/don't see my mother/father” (De Bourdeaudhuij et al., 2005).

Parental modeling of intake of unhealthy snacks was assessed using the statement; “How often do your parents eat sweet or fatty snacks?”. Parental modeling of intake of soft drinks with sugar was assessed using the statement; “How often do your parents drink carbonated soft drink with sugar?”. The two questions had five answer categories on a 5-point scale. The answer categories were; always (=5), often (=4), sometimes (=3), seldom (=2) and never (=1). Parental modeling of soft drinks was modified from the ENERGY project (Singh et al., 2011). Soft drinks in the ENERGY questionnaire also included fizzy drinks and fruit squash, which was excluded in the ESSENS questionnaire. In a validation study of the ENERGY questionnaire, among 10 to 12 year-olds in six European countries, the question showed reliability ICC and construct validity ICC value of 1.00, where values ≥ 0.81 was classified as excellent (Singh et al., 2011). The question on parental modeling of unhealthy snacks was modified from the question on parental modeling of soft drinks.

Self-efficacy for healthy eating

Self-efficacy for healthy eating was assessed using a 7-item scale, asking how much the 8th graders agreed or disagreed with different statements. The questions had five answer

categories from strongly agree to strongly disagree with a neutral midpoint. A high score meant high self-efficacy for healthy eating. All statements began with; "Whenever I have a choice of the food I eat..".

The statements used to assess self-efficacy for healthy eating were; "I find it difficult to choose low-fat foods (e.g. fruit instead of chips or "lite" milk rather than "full cream" milk)", "I find it easy to choose a healthy snack when I eat in between meals (e.g. fruit or reduced-fat yoghurt)", "I believe I have the knowledge and ability to choose/prepare healthy snacks", "I find it difficult to choose healthy meals/snacks when I am eating out with my friends", "I find it easy to eat at least five servings of fruit and vegetables each day" and "I find it easy to have healthy portion sizes during meals (e.g. not eat until I feel too full)".

The scale assessing self-efficacy for healthy eating was adapted and modified from Dewar et al. 2012 (Dewar, Lubans, Plotnikoff, & Morgan, 2012). The scale was originally developed based on constructs from Bandura's social cognitive theory, and an evaluation study showed that the original scale had an ICC of 0.89 and CCA of 0.7 (Dewar et al., 2012). The scale in the ESSENS study had CCA of 0.58 for the internal consistency. The initial scale had two different statements for fruit and vegetables, which was changed to one statement in the ESSENS questionnaire. The initial statements were "I find it easy to eat at least 3 servings of fruit each day" and "I find it easy to eat at least 4 servings of vegetables/salad each day". The statements were modified to Norwegian conditions to "I find it easy to eat at least five servings of fruit and vegetables each day".

4.4 Pilot

A pilot-test was arranged in October at a secondary school in a municipality boarding to Øvre Romerike. One 8th grade class with 22 students participated and answered the questionnaire in a paper format. The class teacher had informed the parents about the pilot-test in advance, and received no denial or negative comments. The reason the questionnaire was not done electronic was due to permission from the Norwegian social science data services that stated that a pilot could be conducted without parental consent if it was done in paper format. The main aim with the pilot was to test the length of the questionnaire to see if it should be shortened, and to find out if any of the questions were difficult to understand for the target

group. The school predisposed 90 minutes that gave time for the students to answer the questionnaire and a plenary discussion afterwards. The master students were present in the classroom to answer any questions during the answering of the questionnaire, and to facilitate the discussion afterwards. The assumption was that the questionnaire would take approximately 45 minutes to answer. The students used 18 to 50 minutes, where the majority spent 30 to 40 minutes. Due to the fact that they answered in paper format, a concern was that it might take longer time to conduct the questionnaire electronically. The questionnaire was therefore shortened to make sure the survey would not feel too extensive and comprehensive for the participants. Few questions that were the least important data for the study were deleted. During the discussion, the students were engaged and gave feedback that they thought the questionnaire was long, but none of the questions were difficult to understand. Several said they had no idea about their own body weight. Very few asked questions during the answering, but a couple of the students wondered if going away on holiday meant both in Norway and in other countries. The class received two fruit baskets and fact sheets about diet, physical activity and sedentary behavior as recompense.

4.5 Sample and sampling method

The sample and target group of the quantitative part of the ESSENS study was all 8th graders in Øvre Romerike. Students with physical or psychological disabilities, that were unable to answer a questionnaire electronically, were excluded from the study.

Øvre Romerike is one of four districts in Akershus County. Akershus border to Oslo and is divided in the four following districts: Øvre Romerike, Nedre Romerike, Follo and the West district. The six municipalities located in Øvre Romerike are Hurdal, Eidsvoll, Nannestad, Ullensaker, Nes and Gjerdrum. For description of the location of Øvre Romerike, and the other districts and municipalities in Akershus County, see figure 2. In January 2016 the total population in Øvre Romerike was 100 210 people (Akershus fylkeskommune, 2016). In Øvre Romerike, with exception from Gjerdrum municipality, the share with education above secondary school, is lower than in Norway as a whole (Folkehelseinstituttet, 2015).

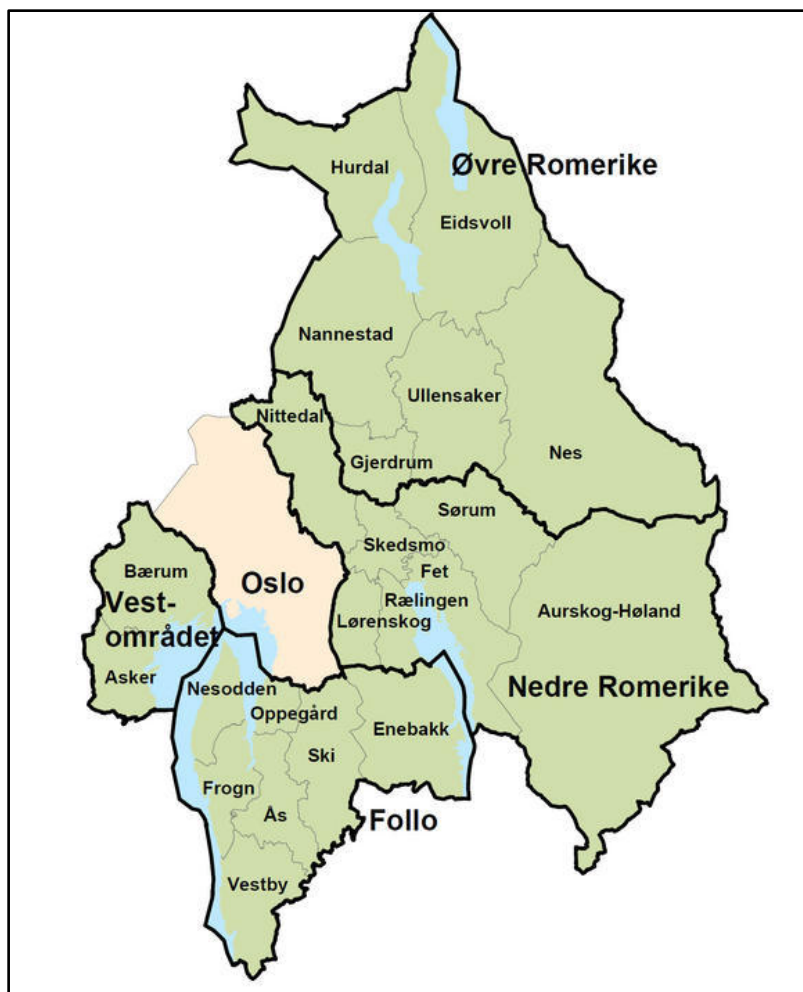


Figure 2: Map of Oslo and the four districts of Akershus County, with Øvre Romerike in the north (Akershus fylkeskommune, 2015).

4.5.1 Target group

Adolescence is a broad concept including cognitive, emotional, physical and social changes, which occur during the transitional period between childhood and adulthood. There is no clear consensus about when this period begins and ends (Cumming et al., 2012). The World Health Organization defines adolescence to be from the age of 10 to 19 years (World Health Organization, 2001). United Nations Children's Fund (UNICEF) concur in this definition, and goes further by dividing adolescence into two periods; early adolescence from 10 to 14 years and late adolescence from 15 to 19 years (United Nations Children's Fund, 2011). In this thesis, the terms adolescence and adolescent is used in reference to "early adolescence".

Health choices, such as eating behaviors and physical activity, change during adolescence (World Health Organization, 2012). The age period between 11 and 15 years is a period where adolescents go through many changes. They increase their autonomy and decision-making power, which in turn may influence their dietary behaviors (Verloigne et al., 2012; World Health Organization, 2012). European adolescents have good health in general, but are failing to reach their full potential (World Health Organization, 2012). Dietary behaviors established during adolescence can continue into adulthood, and adolescents are therefore an important target group for health interventions (Craigie et al., 2011; Kelder, Perry, Klepp, & Lytle, 1994; Lake, Mathers, Rugg-Gunn, & Adamson, 2006; Lien et al., 2001; Mikkilä, Räsänen, Raitakari, Pietinen, & Viikari, 2005; World Health Organization, 2012).

4.5.2 Recruitment

The master students mapped the schools and number of students in Øvre Romerike in prior of the recruitment process. The recruitment process was done in three main steps. First, representatives from the ESSENS study presented the project in a meeting with school-leaders² from the six municipalities in Øvre Romerike. All 12 secondary schools in Øvre Romerike were then invited to participate. Lastly, consent forms were sent to the students' parents, for approval of their child's participation.

The two master students visited each school personally four to six times in the recruitment and data collection process, and drove in total more than 3150 kilometers. The master students borrowed a car, and the ESSENS study funded the travelling expenses. The entire month of November went to the recruitment process, and the month of December, up to the 21th, went to conducting the data collection.

Meeting with school-leaders

In October 2015, a meeting that included the six school-leaders from each of the municipalities in Øvre Romerike, representatives from FØR and representatives from the ESSENS study (a researcher from the qualitative part and a master student from the quantitative part) was held. The meeting was arranged to present the ESSENS study to the school-leaders in the municipalities that were to be recruited. The aim of the meeting was to engage the school leaders to be positive for the schools in their municipality to participate.

² The head of all schools and kindergartens in a municipality.

The meeting was successful and the school-leaders showed engagement towards the study. The project group formulated an e-mail (appendix 2) on behalf of the school-leaders with information about the study, including a fact-sheet (appendix 2) that the school-leaders sent to the principals at each school. The e-mail also contained information about the fact that the principals would be contacted by phone by representatives from the ESSENS study.

Recruiting schools

The master students called the principals one by one to arrange for a meeting at their school, where they were invited to participate in the study. The meetings with the principals were conducted the following weeks. The aim of the first meeting was to bring an invitation letter and consent form (appendix 3), gather information about number of students, classes, and teachers, and answer any questions the principals would have about the study. At the schools that chose to participate in the study, the master students kept contact with one contact person at each school to arrange for the continuing recruitment process of students and parents.

Recruiting students and parents

At the participating schools, all students in 8th grade received an information letter (appendix 4) and informed consent form for the parents to sign (appendix 5). The consent form also contained a question of parental length of education, which was asked of both parents. Student participation required written consent from a parent. One week after receiving the informed consent form the parents were sent a reminder by e-mail or through the schools' electronic communication system. When the master students returned to the schools to collect the consent forms, all 8th grade classes were visited to encourage for participation, and extra consent forms were handed out to the students if needed. The students were also informed that if they had not yet returned the signed consent form, it was possible to participate as long as they brought it on the day of the data collection. The master students encouraged schools with low response rate to send a second reminder to the parents. The master students also visited one school with low response rate a second time for extra encouragement of the students.

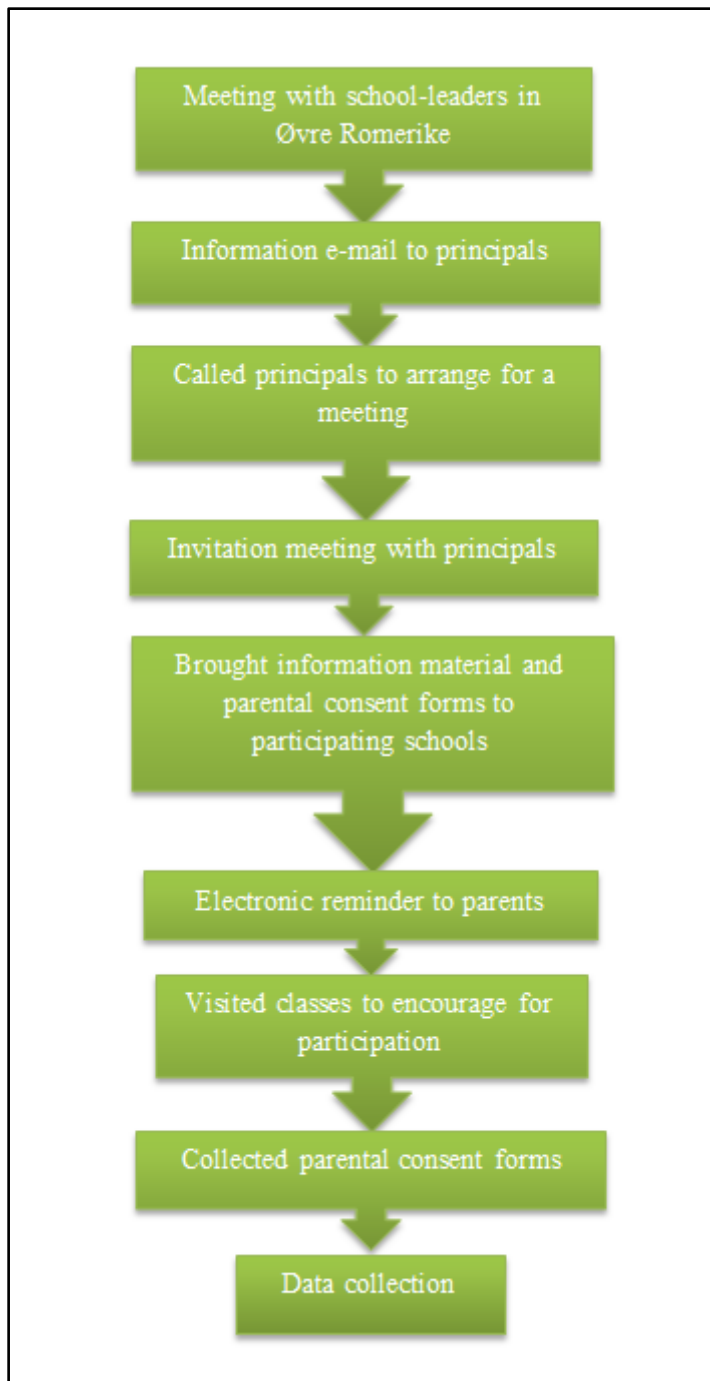


Figure 3: Flow diagram of the recruitment process and data collection of the ESSENS study.

4.5.3 Subjects

All secondary schools ($n = 12$) in Øvre Romerike were invited to participate in the ESSENS study. Of the invited schools, 11 agreed to participate. All 8th graders in the 11 participating schools ($n = 1163$) were invited to participate. A total of 781 8th graders (67% of the 1163 8th graders) returned a signed parental consent form, and 740 of these students (64% of the 1163 8th graders) filled in the questionnaire. Missing data and duplicate ID numbers were deleted, resulting in a sample of 728 8th graders (63% of the 1163 8th graders invited to participate).

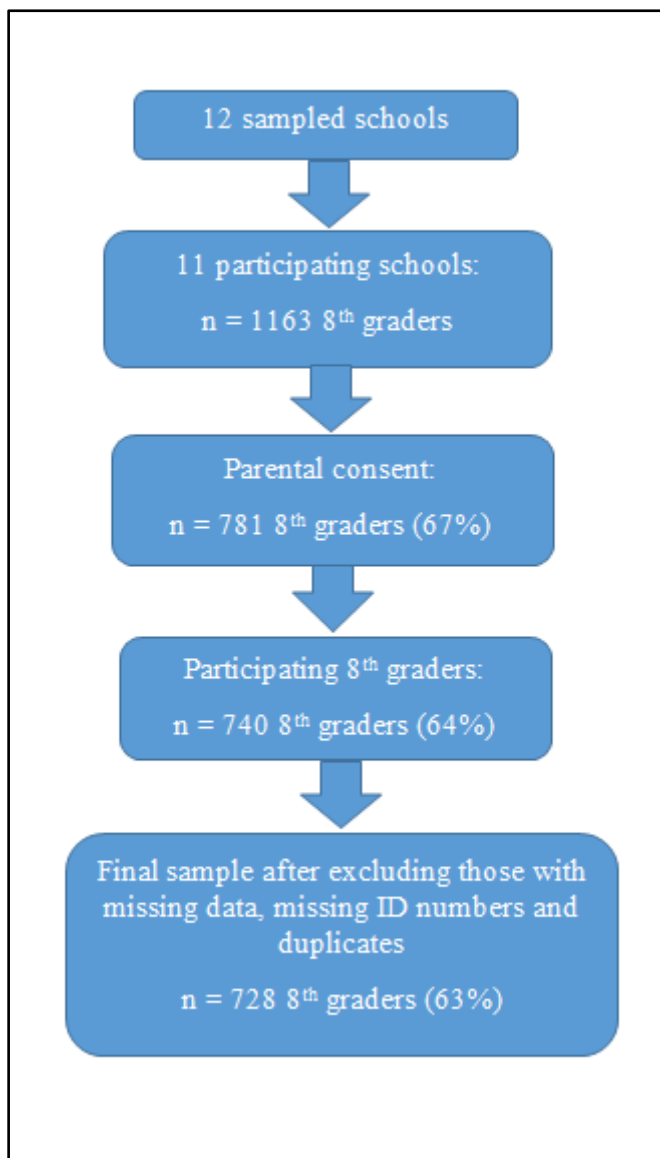


Figure 4: Flow diagram of the sample in the ESSENS study.

4.6 Data Collection

The data collection was conducted from November 30th to December 21th 2015. The data collection was done at the respective schools, over one or two days, depending on the number of 8th grade classes in each school, which varied from three to six classes. In each school, one, two or three classes answered the questionnaire at the same time. It was clarified with the contact person at each school that preferably no more than two classes should answer at the same time, so one master student always could be present in each class. In two of the schools, three classes had to answer at the same time, and in these cases, a third researcher in the project was present. The two master students were present during the collection to arrange for the participation, answer questions, help if computer problems occurred, and make sure the students answered individually. The schools disposed 45 to 60 minutes for each class, depending on each schools length of a regular school hour. Each student received a note with his or her ID number. This was done so that the master students could link each student's answer with the correct parental education information. The ID numbers were prepared by the master students in advance, and the students who brought the signed consent form the day of the data collection, received an ID number that day. The survey was electronic with an open link that was posted on each class' "It's learning" portal. There was no individual password to enter the survey, but the students had to write their ID number in the second question in the questionnaire, that was a required field. To be able to link the student with parental educational level therefore depended on that the students wrote their correct ID number. The contact person in each school was told that the link had to be deleted from the "It's learning" portal directly after the school's participation. Students who did not participate in the survey were either present in the same room doing schoolwork, or had teaching in a separate room.

After participation, the master students sent e-mails with gratitude to all schools that participated in the survey. All classes and staff in each school received fruit baskets sponsored by Folkehelsenettverk Øvre Romerike, ordered and arranged by the master students.

4.7 Statistical analysis

IBM SPSS statistics 23 was used to conduct the statistical analysis (IBM Corporation, 2015). Data from the questionnaire was transferred from LimeSurvey to SPSS. Parental educational level was answered on paper format in the parental consent form, and was therefore typed in manually in SPSS as an additional variable for each subject.

Descriptive statistics showed that the variables for dietary behaviors and the correlates of dietary behaviors were not normally distributed. Both parametric and non-parametric tests were conducted to explore gender differences and SEP differences of the dietary behaviors and the corresponding correlates. The parametric and non-parametric tests showed similar scores, and parametric tests are chosen for the statistical analyses. The level of significance for all analyses was set to $p < 0.05$. Violations of assumptions of the statistical tests were checked.

Descriptive statistics was conducted for demographic information to find mean and standard deviation for age, and number and percentage distribution for gender, ethnicity (ethnic Norwegian and ethnic minority) and parental educational level. Independent sample t-test and chi-square test for independence were conducted to find significant differences between genders.

Descriptive statistics were used to find mean and 95% confidence interval of intake of fruit, vegetables, unhealthy snacks and soft drinks with sugar. Independent samples t-test was conducted to find significant differences in the dietary behaviors between genders. The same procedure was used for the potential correlates of the dietary behaviors; accessibility of food at home, rules related to food consumption, parental modeling and self-efficacy for healthy eating.

One-way ANOVA was used to explore the differences in dietary behaviors and the differences in correlates of the dietary behaviors between the parental educational groups. Additional Tukey post-hoc test was performed to determine between which groups the significant difference was present. The assumption of homogeneity of variance was violated in the parental educational groups' intake of unhealthy snacks, as well as for several of the correlates of the dietary behaviors (Levene's test $p < 0.05$). Significant value from Welch test is therefore presented.

Multivariate linear regression analyses were conducted to explore the correlates association with the dietary behaviors. Assumptions for multivariate linear regression were met. Dependent variables were intake of fruit, vegetables, unhealthy snacks and soft drinks. Independent variables were age, gender, ethnicity, parental educational level, accessibility, parental rules, parental modeling and self-efficacy for healthy eating. Parental educational level was dummy coded, and low parental educational level was chosen as reference category. Univariate linear regression was first conducted to identify each correlates potential association with the dietary behaviors. All correlates were significant variables in the univariate regression and were entered in the multivariate regression models. Age, gender, ethnicity and parental educational level were adjusted for in all models.

Mediation analyses were conducted to explore if significant correlates of soft drink consumption mediated the association between parental educational level and soft drink consumption. The analyses were conducted using SPSS PROCESS Macro 2.15 (Hayes, 2016). A mediator is a variable that partially or completely explains the association between an independent and a dependent variable. The independent variable leads to the mediator, which in turn leads to the outcome (MacKinnon, 2008). In a multiple mediation analysis all potential mediators are adjusted for each other.

Single mediation analyses were first conducted for the potential mediators: accessibility, parental rules and parental modeling. All three correlates showed a significant mediating effect for high parental educational level. Accessibility also mediated the association with medium parental educational level. The multiple mediation model in this thesis is shown in figure 5, where accessibility, parental rules and parental modeling are potential mediators for the association between parental educational level and intake of soft drinks. The association between the independent variable (X) and the mediators (M_1 , M_2 , M_3) is represented in the a-path. The b-path represents the association between the mediators and the dependent variable (Y). The c-path represents the association between X and Y, called the total effect, and the c'-path represent the association between X and Y adjusted for the mediators, called the direct effect. The idea is that the c-path should get smaller when adding a mediator (MacKinnon, 2008). If the product of $a*b$ (the indirect effect) is significant, a mediation has occurred. In multiple mediation analyses the specific indirect effect is each mediator's indirect effect, and the total indirect effect is the indirect effect of all the mediators (Hayes, 2009). Single and multiple mediation analyses were adjusted for age, gender and ethnicity.

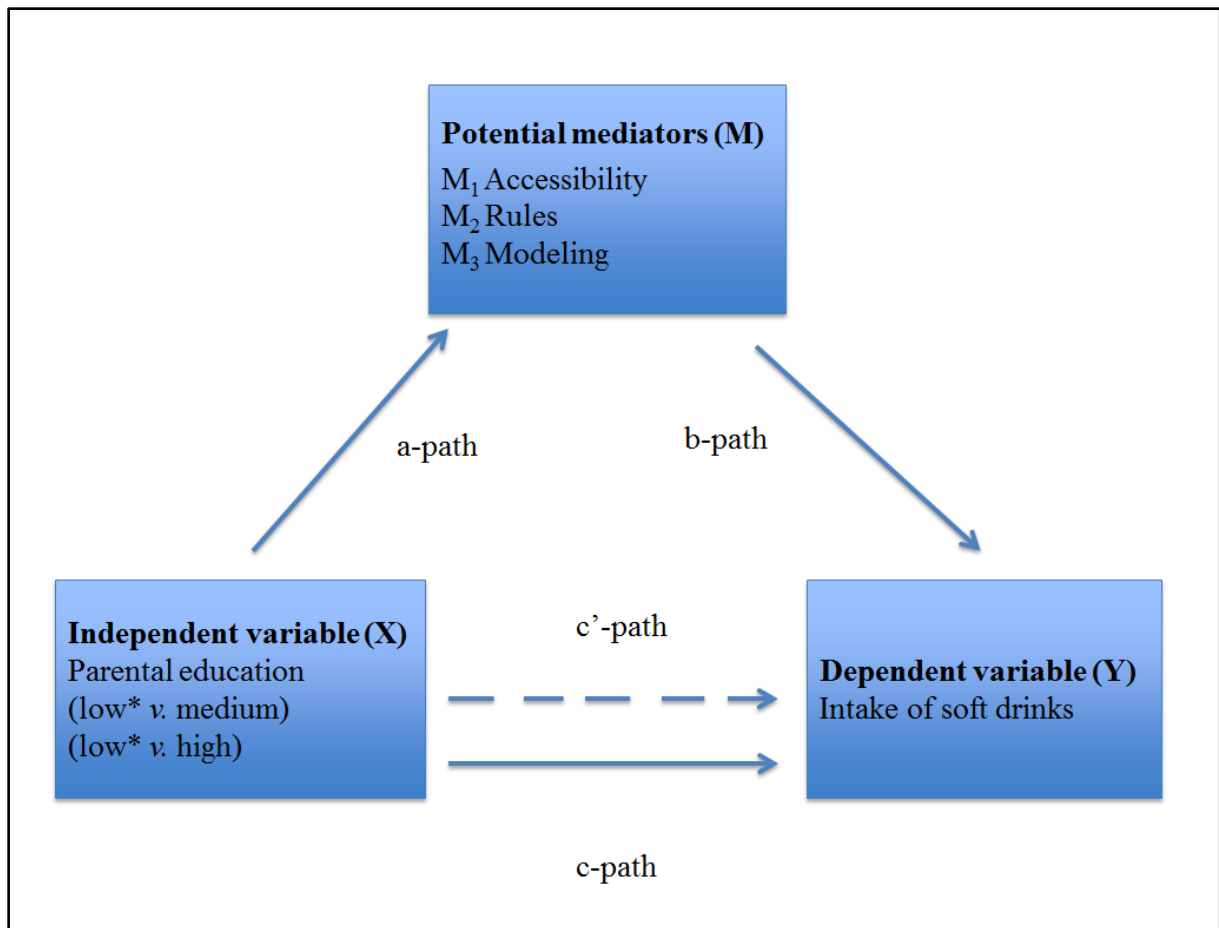


Figure 5: The mechanism of mediation. Potential mediators of the association between parental educational level and soft drink consumption: accessibility, parental rules and parental modeling. Age, gender and ethnicity were adjusted for in the analyses. * Reference category.

The multi-categorical variable of parental educational level was the independent variable (X) in the mediation analyses. The dummy coding function in SPSS PROCESS Macro 2.15 was used, and low parental education was set as reference category. Intake of soft drinks with sugar was the dependent variable (Y), which was a continuous variable. The potential mediators (M) were accessibility of soft drinks, parental rules related to soft drink consumption and parental modeling of soft drinks, which all were continuous variables.

Bootstrapping (Hayes, 2009) was used to find the 95% confidence interval of the effect size of a*b-path. Bootstrapping was done by resampling 1000 independent samples. Significant mediating effect occurred if the confidence interval did not cross 0. The product of a*b was

used to find the percentage mediated effect. Percentage mediated effect (ab/c) was calculated where there was a significant mediated effect.

4.8 Ethical aspects

The ESSENS study was approved by the Norwegian social science data services. (appendix 6). A written informed consent was collected from all principals at the participating schools. A written informed consent for the 8th graders participation was provided by one parent or legal guardian. The students were informed that the study was voluntary and anonymous, and consented by participating and submitting the questionnaire. Personal information (names, schools etc.) was kept in a locked cabinet at the Oslo and Akershus University College. Data in the electronic survey was protected by a password, and was only available for the project members in the ESSENS study.

5.0 Results

5.1 Sample

Demographic characteristics of the sample are presented in table 1. Of the 728 included 8th graders 54% were girls. The mean age of the participants was 13.7 (*SD*: 0.3) years. Ethnic minorities represented 9.2% of the sample. The distribution of parental educational level was divided as following; 40.2% with ≤ 12 years, 34.3% with 13 to 16 years, and 25.5% with parental educational level > 16 years. There were no significant differences in demographic characteristics between genders.

Table 1: Socio-demographic characteristics of the sample in the ESSENS study ($n = 728$).

	Total		Girls		Boys		P-value
	$n=728$ (100%)		$n=393$ (54%)		$n=335$ (46%)		
Age (years) <i>mean (SD)</i>	13.7	(0.3)	13.7	(0.3)	13.7	(0.3)	0.918 ^a
Ethnicity <i>n, %</i>							
Ethnic norwegian	660	90.8	357	90.8	303	90.7	1.000 ^b
Ethnic minority	67	9.2	36	9.2	31	9.3	
Parental educational level <i>n, %</i>							
≤ 12 years	282	40.2	156	41.1	126	39.1	0.831 ^b
13-16 years	241	34.3	126	33.2	115	35.7	
> 16 years	179	25.5	98	25.8	81	25.2	

^a Independent-Samples T-Test.

^b Chi-square test for independence.

The numbers (n) vary slightly across variables due to missing data.

5.2 Dietary behaviors

The 8th graders intake of fruit, vegetables, unhealthy snacks and carbonated soft drinks with sugar is presented in table 2. The total mean intake of fruit was 6.9 times per week (95% *CI*: 6.4 to 7.3), vegetables 8.7 times per week (95% *CI*: 8.3 to 9.2), unhealthy snacks 4.5 times per week (95% *CI*: 4.3 to 4.8), and total mean intake of soft drinks was 7.0 dl per week (95% *CI*: 6.6 to 7.5). There was a significant difference ($p = 0.006$) in soft drink consumption between genders, with 6.4 dl per week (95% *CI*: 5.8 to 7.0) and 7.8 dl per week (95% *CI*: 7.0 to 8.6) for girls and boys, respectively. There were no significant differences in intake of fruit, vegetables and unhealthy snacks between genders.

Table 2: Dietary behaviors among the 8th graders ($n = 728$).

	Total ($n=728$)		Girls ($n=393$)		Boys ($n=335$)		P-value*
	Mean	95% CI	Mean	95% CI	Mean	95% CI	
Fruit (times/wk)	6.9	(6.4, 7.3)	6.8	(6.2, 7.4)	6.9	(6.3, 7.6)	0.763
Vegetables (times/wk)	8.7	(8.3, 9.2)	8.6	(8.0, 9.2)	8.9	(8.1, 9.7)	0.595
Unhealthy snacks (times/wk)	4.5	(4.3, 4.8)	4.5	(4.1, 4.9)	4.6	(4.2, 5.0)	0.717
Soft drinks (dl/wk)	7.0	(6.6, 7.5)	6.4	(5.8, 7.0)	7.8	(7.0, 8.6)	0.006

* Independent-Samples T-Test.

CI: Confidence interval.

Bold values represent significant differences ($p < 0.05$).

5.3 Correlates of dietary behaviors

Descriptive statistics for perceived home accessibility, perceived parental rules, perceived parental modeling, and self-efficacy for healthy eating are presented in table 3.

Perceived accessibility

The accessibility was in general higher for fruit and vegetables than for unhealthy snacks and soft drinks. The mean score of accessibility of fruit was 3.9 (95% CI: 3.8 to 3.9), vegetables 4.1 (95% CI: 4.0 to 4.1), unhealthy snacks 2.5 (95% CI: 2.4 to 2.5) and soft drinks 2.6 (95% CI: 2.5 to 2.7). There were no significant differences of accessibility between genders.

Perceived parental rules

The 8th graders experienced prohibitive rules for unhealthy snacks and soft drinks, with mean scores of 3.9 (95% CI: 3.8 to 4.0) and 4.3 (95% CI: 4.2 to 4.3), respectively. The mean scores for permissive rules related to fruit and vegetable intake were 4.6 (95% CI: 4.5 to 4.6), for both fruit and vegetables. There was a significant difference between genders in rules related to vegetable intake ($p = 0.032$), where girls experienced more permissive rules (*mean*: 4.6, 95% CI: 4.5 to 4.7) compared to boys (*mean*: 4.5, 95% CI: 4.4 to 4.6).

Perceived parental modeling

Maternal and paternal modeling of fruit had mean scores of 3.8 (95% *CI*: 3.7 to 3.9) and 3.5 (95% *CI*: 3.5 to 3.6), respectively. Maternal modeling of vegetables had mean score of 4.2 (95% *CI*: 4.1 to 4.3) and paternal modeling of vegetables had mean score of 4.0 (95% *CI*: 4.0 to 4.1). Parental modeling of unhealthy snacks and soft drinks had similar mean scores of 2.7 (95% *CI*: 2.7 to 2.8). Modeling of unhealthy snacks showed a significant difference ($p = 0.028$) between genders, with mean scores of 2.8 (95% *CI*: 2.7 to 2.8) and 2.7 (95% *CI*: 2.6 to 2.7) for girls and boys respectively.

Self-efficacy for healthy eating

The total mean score of self-efficacy for healthy eating was 3.5 (95% *CI*: 3.4 to 3.5), for girls and boys, with no significant differences between genders.

Table 3: Correlates of dietary behaviors among the 8th graders ($n = 728$).

	α	Total ($n=728$)		Girls ($n=393$)		Boys ($n=335$)		P-value*
		Mean	95% CI	Mean	95% CI	Mean	95% CI	
Accessibility								
Fruit	0.56	3.9	(3.8, 3.9)	3.7	(3.8, 3.9)	3.9	(3.8, 4.0)	0.397
Vegetables	0.75	4.1	(4.0, 4.1)	4.1	(4.0, 4.2)	4.0	(4.0, 4.1)	0.155
Unhealthy snacks	0.42	2.5	(2.4, 2.5)	2.5	(2.4, 2.6)	2.5	(2.4, 2.6)	0.345
Soft drinks	0.72	2.6	(2.5, 2.7)	2.5	(2.4, 2.6)	2.6	(2.5, 2.8)	0.152
Rules								
Fruit	0.74	4.6	(4.5, 4.6)	4.6	(4.5, 4.7)	4.5	(4.4, 4.6)	0.078
Vegetables	0.66	4.6	(4.5, 4.6)	4.6	(4.5, 4.7)	4.5	(4.4, 4.6)	0.032
Unhealthy snacks	**	3.9	(3.8, 4.0)	3.9	(3.8, 4.0)	4.0	(3.8, 4.1)	0.964
Soft drinks	0.86	4.3	(4.2, 4.3)	4.2	(4.1, 4.4)	4.3	(4.2, 4.4)	0.545
Parental modeling								
Fruit mother	**	3.8	(3.7, 3.9)	3.8	(3.7, 3.9)	3.8	(3.6, 3.9)	0.816
Fruit father	**	3.5	(3.5, 3.6)	3.5	(3.4, 3.6)	3.6	(3.5, 3.7)	0.266
Vegetables mother	**	4.2	(4.1, 4.3)	4.2	(4.1, 4.3)	4.2	(4.1, 4.3)	0.381
Vegetables father	**	4.0	(4.0, 4.1)	4.0	(3.9, 4.1)	4.1	(3.9, 4.2)	0.617
Unhealthy snacks	**	2.7	(2.7, 2.8)	2.8	(2.7, 2.8)	2.7	(2.6, 2.7)	0.028
Soft drinks	**	2.7	(2.7, 2.8)	2.7	(2.7, 2.8)	2.7	(2.6, 2.8)	0.373
Self-efficacy	0.58	3.5	(3.4, 3.5)	3.5	(3.4, 3.6)	3.5	(3.4, 3.5)	0.791

* Independent-Samples T-Test.

** Variable not measured by scale.

 α : Cronbach's Coefficient Alpha, CI: Confidence interval.Bold values represent significant differences ($p < 0.05$).

5.4 Association between parental educational level and dietary behaviors

Table 4 presents the results of the association between parental educational level and the dietary behaviors among the 8th graders. Soft drink consumption showed a significant difference ($p = 0.002$) between the low and the high parental educational group, according to Tukey post-hoc test. The group of low parental educational level had mean score of 8.0 dl per week (95% CI: 7.2 to 8.8) compared to the group of high parental educational level with mean score of 5.9 dl per week (95% CI: 5.1 to 6.7). There were no significant differences in soft drink consumption between the low and medium or between the medium and high parental educational groups. Intake of fruit, vegetables and unhealthy snacks did not show significant difference between the parental educational groups. However, the mean scores of vegetable intake were higher in the medium parental educational group compared to the low parental

educational group, and higher in the high parental educational group compared to the medium parental educational group. The mean scores of vegetable intake were 8.4 (95% CI: 7.5 to 9.2), 8.7 (95% CI: 7.9 to 9.5) and 9.3 (95% CI: 8.4 to 10.2) in the low, medium and high parental educational groups respectively. Intake of unhealthy snacks showed a difference in mean scores in the low and medium parental educational groups compared to the high parental educational group, although non-significant. The mean scores of intake of unhealthy snacks were 4.6 (95% CI: 4.1 to 5.0), 4.6 (95% CI: 4.1 to 5.1) and 4.2 (95% CI: 3.9 to 4.5) in the low, medium and high parental educational groups respectively.

Table 4: Association between parental educational level and dietary behaviors among the 8th graders ($n = 728$).

	Total ($n=702$)		Parental educational level						P-value*
	Mean	95% CI	≤ 12 years ($n=282$)		13-16 years ($n=241$)		> 16 years ($n=179$)		
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	
Fruit (times/wk)	6.9	(6.4, 7.3)	6.9	(6.2, 7.7)	6.8	(6.0, 7.5)	7.0	(6.2, 7.9)	0.917
Vegetables (times/wk)	8.7	(8.3, 9.2)	8.4	(7.5, 9.2)	8.7	(7.9, 9.5)	9.3	(8.4, 10.2)	0.321
Unhealthy snacks (times/wk)	4.5	(4.3, 4.8)	4.6	(4.1, 5.0)	4.6	(4.1, 5.1)	4.2	(3.9, 4.5)	0.290 ^a
Soft drinks (dl/wk)	7.0	(6.6, 7.5)	8.0	(7.2, 8.8)	6.8	(5.9, 7.6)	5.9	(5.1, 6.7)	0.002

* One-way ANOVA.

^a Welch Test.

CI: Confidence interval.

Bold values represent significant differences ($p < 0.05$).

5.5 Association between parental educational level and correlates of dietary behaviors

The association between parental educational level and the correlates of dietary behaviors is presented in table 5.

Perceived accessibility of fruit, vegetables, unhealthy snacks and soft drinks

The three groups of parental educational level had similar mean scores of accessibility of fruit and unhealthy snacks, but a significant difference was found in accessibility of vegetables ($p = 0.011$) and soft drinks ($p < 0.001$). Tukey post-hoc test showed that the significant difference in accessibility of vegetables was between the group of low parental education and the group of high parental education ($p = 0.012$), with mean scores of 4.0 (95% *CI*: 3.9 to 4.1) and 4.2 (95% *CI*: 4.1 to 4.3), respectively. The significant difference in accessibility of soft drinks was between the low and high parental educational group ($p < 0.001$), and between the medium and high parental educational group ($p = 0.010$), according to Tukey post-hoc test. The mean scores of accessibility of soft drinks were 2.8 (95% *CI*: 2.7 to 2.9), 2.6 (95% *CI*: 2.4 to 2.7) and 2.2 (95% *CI*: 2.1 to 2.4) in the low, medium and high parental educational group, respectively.

Perceived parental rules related to the dietary behaviors

Perceived parental rules related to intake of fruit ($p = 0.021$), vegetables ($p = 0.020$), unhealthy snacks ($p < 0.001$) and soft drinks with sugar ($p < 0.001$), all showed significant differences between the parental educational groups. The group with high parental education experienced more permissive rules for fruit and vegetables, and more prohibitive rules for unhealthy snacks and soft drinks, compared to the groups with lower parental education. Significant values from Tukey post-hoc test are presented below.

Permissive rules related to fruit intake showed significant difference between the low and high parental educational group ($p = 0.029$), with mean scores of 4.5 (95% *CI*: 4.4 to 4.6) and 4.7 (95% *CI*: 4.6 to 4.7), respectively. Permissive rules related to intake of vegetables also showed significant difference ($p = 0.021$) between the low and high parental educational group, where the low parental educational group had mean score of 4.5 (95% *CI*: 4.4 to 4.6) and the high parental educational group had mean score of 4.6 (95% *CI*: 4.6 to 4.7).

Prohibitive rules related to intake of unhealthy snacks showed significant difference between

both the low and medium parental educational group ($p = 0.004$) and between the low and high parental educational group ($p < 0.001$). The mean scores were 3.7 (95% *CI*: 3.5 to 3.8), 4.0 (95% *CI*: 3.8 to 4.1) and 4.2 (95% *CI*: 4.1 to 4.4) for the low, medium and high parental educational group, respectively. A significant difference in prohibitive rules related to soft drink intake, was found both between the low and high parental educational group ($p < 0.001$) and between the medium and high parental educational group ($p = 0.004$). The mean scores were 4.1 (95% *CI*: 4.0 to 4.2), 4.2 (95% *CI*: 4.1 to 4.4) and 4.6 (95% *CI*: 4.5 to 4.7) for the low, medium and high parental educational group, respectively.

Perceived parental modeling of the dietary behaviors

Perceived parental modeling showed a significant difference for fruit ($p < 0.001$), vegetables ($p < 0.001$) and soft drinks ($p = 0.016$) between the parental educational groups. The high parental educational group modeled higher intake of FV and lower intake of soft drinks compared to the lower parental educational groups. Results from Tukey post-hoc test are presented below.

A significant difference in maternal modeling of fruit was found between the low and high ($p < 0.001$) and between the medium and high parental educational group ($p = 0.003$). The mean scores were 3.6 (95% *CI*: 3.5 to 3.8), 3.8 (95% *CI*: 3.6 to 3.9) and 4.1 (95% *CI*: 4.0 to 4.2), in the low, medium and high parental educational group, respectively. Paternal modeling of fruit showed significant difference between the low and high parental educational group ($p < 0.001$). The mean scores were 3.3 (95% *CI*: 3.2 to 3.5) and 3.8 (95% *CI*: 3.7 to 4.0) for the low and high parental educational group, respectively. Maternal modeling of vegetables showed a significant difference between the low and high parental educational group ($p < 0.001$) and between the medium and high parental educational group ($p = 0.008$). Mean scores of maternal modeling of vegetables were 4.1 (95% *CI*: 4.0 to 4.2), 4.2 (95% *CI*: 4.1 to 4.3) and 4.5 (95% *CI*: 4.4 to 4.6), in the low, medium and high parental educational group, respectively. Paternal modeling of vegetables showed a significant difference between both the low and high parental educational group ($p < 0.001$) and between the medium and high parental educational group ($p = 0.011$). The mean scores in the low, medium and high parental educational groups were 3.9 (95% *CI*: 3.7 to 4.0), 4.0 (95% *CI*: 3.9 to 4.2) and 4.3 (95% *CI*: 4.2 to 4.5), respectively.

Parental modeling of soft drinks showed significant difference both between the low and high parental educational group ($p = 0.027$) and between the medium and high parental educational group ($p = 0.029$). The medium and low parental educational group had similar mean score of 2.8 (95 % *CI*: 2.7 to 2.9). The high parental educational group experienced lower modeling of soft drink consumption, with a mean score of 2.6 (95% *CI*: 2.4 to 2.7). Modeling of unhealthy snacks did not show any significant differences between the parental educational groups.

Self-efficacy for healthy eating

Self-efficacy for healthy eating did not show significant differences between the groups of parental educational level, but the significance value was borderline ($p = 0.088$). The mean scores of self-efficacy for healthy eating were 3.3 (95% *CI*: 3.3 to 3.5), 3.5 (95% *CI*: 3.4 to 3.6) and 3.6 (95% *CI*: 3.5 to 3.7) in the low, medium and high parental educational groups, respectively.

Table 5: Association between parental educational level and correlates of the dietary behaviors among the 8th graders ($n = 728$).

	Parental educational level								
	Total ($n=702$)		≤ 12 years ($n=282$)		13-16 years ($n=241$)		> 16 years ($n=179$)		P-value*
	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	
Accessibility									
Fruit	3.9	(3.8, 3.9)	3.9	(3.8, 4.0)	3.9	(3.8, 4.0)	3.9	(3.8, 4.0)	0.558
Vegetables	4.1	(4.0, 4.1)	4.0	(3.9, 4.1)	4.1	(4.0, 4.2)	4.2	(4.1, 4.3)	0.011^a
Unhealthy snacks	2.5	(2.4, 2.5)	2.5	(2.4, 2.6)	2.5	(2.3, 2.6)	2.5	(2.4, 2.6)	0.395
Soft drinks	2.6	(2.5, 2.7)	2.8	(2.7, 2.9)	2.6	(2.4, 2.7)	2.2	(2.1, 2.4)	0.000
Rules									
Fruit	4.6	(4.5, 4.6)	4.5	(4.4, 4.6)	4.6	(4.5, 4.7)	4.7	(4.6, 4.7)	0.021^a
Vegetables	4.6	(4.5, 4.6)	4.5	(4.4, 4.6)	4.6	(4.5, 4.7)	4.6	(4.6, 4.7)	0.020^a
Unhealthy snacks	3.9	(3.8, 4.0)	3.7	(3.5, 3.8)	4.0	(3.8, 4.1)	4.2	(4.1, 4.4)	0.000^a
Soft drinks	4.3	(4.2, 4.4)	4.1	(4.0, 4.2)	4.2	(4.1, 4.4)	4.6	(4.5, 4.7)	0.000^a
Parental modeling									
Fruit mother	3.8	(3.7, 3.9)	3.6	(3.5, 3.8)	3.8	(3.6, 3.9)	4.1	(4.0, 4.2)	0.000^a
Fruit father	3.5	(3.5, 3.6)	3.3	(3.2, 3.5)	3.6	(3.4, 3.7)	3.8	(3.7, 4.0)	0.000^a
Vegetables mother	4.2	(4.1, 4.3)	4.1	(4.0, 4.2)	4.2	(4.1, 4.3)	4.5	(4.4, 4.6)	0.000^a
Vegetables father	4.0	(4.0, 4.1)	3.9	(3.7, 4.0)	4.0	(3.9, 4.2)	4.3	(4.2, 4.5)	0.000
Unhealthy snacks	2.7	(2.7, 2.8)	2.7	(2.7, 2.8)	2.7	(2.6, 2.8)	2.7	(2.6, 2.8)	0.686 ^a
Soft drinks	2.7	(2.7, 2.8)	2.8	(2.7, 2.9)	2.8	(2.7, 2.9)	2.6	(2.4, 2.7)	0.016
Self-efficacy									
	3.5	(3.4, 3.5)	3.3	(3.3, 3.5)	3.5	(3.4, 3.6)	3.6	(3.5, 3.7)	0.088

* One-Way ANOVA.

^a Welch test.

CI: Confidence interval.

Bold values represent significant differences ($p < 0.05$).

5.6 Correlates association with dietary behaviors

Perceived accessibility, perceived parental rules, perceived parental modeling and self-efficacy for healthy eating were significantly associated with all the dietary behaviors ($p < 0.05$) in the univariate regression analyses (table 6). Ethnicity was also significantly associated with fruit intake ($p = 0.014$). Gender ($p = 0.005$) and high parental education ($p = 0.005$) were significantly associated with soft drink consumption (table 6).

Results of multivariate regression analyses are presented in table 7. Accessibility, paternal modeling and self-efficacy for healthy eating were significantly positively associated with fruit intake ($p < 0.001$) with beta values of 1.27 (95% CI: 0.67 to 1.87), 0.78 (95% CI: 0.35 to 1.21) and 2.44 (95% CI: 1.76 to 3.11) respectively. The correlates in the model of fruit intake explained 18.1% of the variance in intake of fruit. Accessibility ($p < 0.001$), paternal modeling

($p = 0.018$) and self-efficacy for healthy eating ($p < 0.001$) were significantly positively associated with vegetable intake with beta values of 2.21 (95% *CI*: 1.50 to 2.93), 0.69 (95% *CI*: 0.12 to 1.26) and 2.21 (95% *CI*: 1.39 to 2.84) respectively. The correlates in the model of vegetable intake explained 22.6% of the variance in intake of vegetables.

Accessibility ($p < 0.001$) and parental modeling ($p = 0.007$) were significantly positively associated with unhealthy snacks intake. Prohibitive rules ($p = 0.004$) and self-efficacy for healthy eating ($p < 0.001$) were significantly inversely associated with unhealthy snacks intake. The beta value for accessibility was 1.31 (95% *CI*: 0.94 to 1.67), prohibitive rules -0.34 (95% *CI*: -0.57 to -0.11), parental modeling 0.62 (95% *CI*: 0.17 to 1.07) and self-efficacy for healthy eating -0.85 (95% *CI*: -1.26 to -0.43). The correlates in the model explained 18.3% of the variance in unhealthy snacks intake.

Gender ($p = 0.002$), accessibility ($p < 0.001$) and parental modeling ($p = 0.017$) were significantly positively associated with soft drink consumption. Prohibitive rules ($p < 0.001$) and self-efficacy for healthy eating ($p = 0.016$) were significantly inversely associated with soft drink consumption. The beta value for gender was 1.30 (95% *CI*: 0.48 to 2.13), accessibility 1.58 (95% *CI*: 1.13 to 2.03), prohibitive rules -1.61 (95% *CI*: -2.04 to -1.18), parental modeling 0.70 (95% *CI*: 0.12 to 1.27) and for self-efficacy for healthy eating -0.79 (95% *CI*: -1.44 to -0.15). The correlates in the model of soft drink intake explained 30.4% of the variance in soft drink consumption.

Table 6: Correlates of dietary behaviors, univariate regression ($n = 728$).

	B	95% CI	P-value*
Fruit			
Age	0.90	(-0.60, 2.40)	0.240
Gender ^a	0.14	(-0.76, 1.03)	0.763
Ethnicity ^b	1.92	(0.39, 3.46)	0.014
Medium parental education ^c	-0.17	(-1.13, 0.78)	0.720
High parental education ^c	0.18	(-0.86, 1.22)	0.731
Accessibility	2.15	(1.60, 2.70)	0.000
Rules	0.75	(0.10, 1.39)	0.023
Maternal modeling	1.23	(0.81, 1.64)	0.000
Paternal modeling	1.30	(0.92, 1.67)	0.000
Self-efficacy	3.00	(2.34, 3.66)	0.000
Vegetables			
Age	0.58	(-1.06, 2.22)	0.489
Gender ^a	0.27	(-0.71, 1.24)	0.595
Ethnicity ^b	0.22	(-1.47, 1.90)	0.798
Medium parental education ^c	-0.02	(-1.06, 1.03)	0.976
High parental education ^c	0.80	(-0.34, 1.93)	0.169
Accessibility	3.44	(2.86, 4.02)	0.000
Rules	1.80	(1.11, 2.48)	0.000
Maternal modeling	2.06	(1.56, 2.56)	0.000
Paternal modeling	1.79	(1.33, 2.25)	0.000
Self-efficacy	3.26	(2.54, 3.98)	0.000
Unhealthy snacks			
Age	-0.12	(-1.06, 0.82)	0.808
Gender ^a	0.10	(-0.46, 0.66)	0.717
Ethnicity ^b	0.89	(-0.08, 1.85)	0.070
Medium parental education ^c	0.20	(-0.39, 0.80)	0.503
High parental education ^c	-0.41	(-1.06, 0.24)	0.215
Accessibility	1.76	(1.43, 2.10)	0.000
Rules	-0.71	(-0.93, -0.48)	0.000
Parental modeling	1.37	(0.93, 1.81)	0.000
Self-efficacy	-1.35	(-1.78, -0.93)	0.000
Soft drinks			
Age	0.03	(-1.58, 1.64)	0.971
Gender ^a	1.38	(0.42, 2.33)	0.005
Ethnicity ^b	0.44	(-1.21, 2.10)	0.598
Medium parental education ^c	-0.39	(-1.42, 0.63)	0.453
High parental education ^c	-1.57	(-2.68, -0.47)	0.005
Accessibility	2.65	(2.28, 3.02)	0.000
Rules	-2.57	(-2.97, -2.18)	0.000
Parental modeling	2.48	(1.93, 3.03)	0.000
Self-efficacy	-1.72	(-2.45, -0.98)	0.000

* Univariate regression.

B : Regression coefficient, CI: Confidence interval.

^a Reference category: Girl.

^b Reference category: Ethnic Norwegian.

^c Reference category: Low parental education (≤ 12 years).

Bold values represent significant differences ($p < 0.05$).

Table 7: Correlates of dietary behaviors, multivariate regression ($n = 728$).

	B	95% CI	P-value*
Fruit			
Age	1.36	(-0.05, 2.78)	0.059
Gender ^a	0.02	(-0.83, 0.87)	0.964
Ethnicity ^b	1.33	(-0.14, 2.80)	0.076
Medium parental education ^c	-0.45	(-1.43, 0.53)	0.369
High parental education ^c	-0.64	(-1.73, 0.46)	0.252
Accessibility	1.27	(0.67, 1.87)	0.000
Rules	-0.18	(-0.81, 0.46)	0.590
Maternal modeling	0.27	(-0.22, 0.76)	0.288
Paternal modeling	0.78	(0.35, 1.21)	0.000
Self-efficacy	2.44	(1.76, 3.11)	0.000
r²	0.181		
Vegetables			
Age	1.01	(-0.49, 2.50)	0.186
Gender ^a	0.51	(-0.38, 1.40)	0.263
Ethnicity ^b	0.84	(-0.71, 2.38)	0.287
Medium parental education ^c	-0.24	(-1.28, 0.80)	0.649
High parental education ^c	-0.24	(-1.39, 0.90)	0.677
Accessibility	2.21	(1.50, 2.93)	0.000
Rules	0.27	(-0.42, 1.07)	0.444
Maternal modeling	0.43	(-0.22, 1.07)	0.198
Paternal modeling	0.69	(0.12, 1.26)	0.018
Self-efficacy	2.21	(1.39, 2.84)	0.000
r²	0.226		
Unhealthy snacks			
Age	-0.29	(-1.16, 0.59)	0.521
Gender ^a	0.22	(-0.30, 0.75)	0.403
Ethnicity ^b	0.41	(-0.51, 1.33)	0.384
Medium parental education ^c	0.34	(-0.27, 0.95)	0.268
High parental education ^c	0.05	(-0.62, 0.72)	0.881
Accessibility	1.31	(0.94, 1.67)	0.000
Rules	-0.34	(-0.57, -0.11)	0.004
Parental modeling	0.62	(0.17, 1.07)	0.007
Self-efficacy	-0.85	(-1.26, -0.43)	0.000
r²	0.183		
Soft drinks			
Age	-0.04	(-1.43, 1.34)	0.954
Gender ^a	1.30	(0.48, 2.13)	0.002
Ethnicity ^b	-0.27	(-1.72, 1.17)	0.710
Medium parental education ^c	-0.64	(-1.60, 0.32)	0.194
High parental education ^c	-0.25	(-1.32, 0.82)	0.646
Accessibility	1.58	(1.13, 2.03)	0.000
Rules	-1.61	(-2.04, -1.18)	0.000
Parental modeling	0.70	(0.12, 1.27)	0.017
Self-efficacy	-0.79	(-1.44, -0.15)	0.016
r²	0.304		

* Multivariate regression.

B: Regression coefficient, CI: Confidence interval, r^2 = R square.

^a Reference category: Girl.

^b Reference category: Ethnic Norwegian.

^c Reference category: Low parental education (≤ 12 years).

Bold values represent significant differences ($p < 0.05$).

5.7 Multiple mediation

The results of the mediation analysis are presented in table 8. Perceived accessibility, perceived prohibitive rules and perceived parental modeling were significant mediators of the association between high parental educational level and soft drink intake. Accessibility mediated 43%, prohibitive rules 36% and parental modeling 8% of the association between high parental educational level and soft drink consumption. Accessibility mediated 27% of the association between medium parental educational level and soft drink consumption. Prohibitive rules and parental modeling did not mediate the association with medium parental educational level and soft drink consumption. There was no significant total direct effect (c'-path) of either medium or high parental educational level in the association with soft drink intake, indicating a complete mediation of the correlates.

Table 8: Mediating effect of accessibility, parental rules and parental modeling of the association between parental educational level and intake of soft drinks.

	c-path		c'-path		a-path		b-path	a*b (95 % CI) ^a		ab/c ^b	
	13-16 y ¹	> 16 y ¹	13-16 y ¹	> 16 y ¹	13-16 y ¹	> 16 y ¹		13-16 y ¹	> 16 y ¹	13-16 y ¹	> 16 y ¹
Accessibility	-1.34*	-2.03***	-0.76	-0.27	-0.24*	-0.57***	1.53***	-0.36 (-0.73, -0.10)	-0.87 (-1.36, -0.50)	27 %	43 %
Rules					0.14	0.45***	-1.64***	-0.22 (-0.60, 0.09)	-0.73 (-1.25, -0.34)	-	36 %
Modeling					-0.00	-0.24**	0.68*	-0.00 (-0.12, 0.13)	-0.16 (-0.41, -0.02)	-	8 %

Multiple mediation analysis with multicategorical independent variable.

The model is adjusted for age, gender and ethnicity.

y: Years.

¹ Reference category: Low parental education (≤ 12 years).

Multivariate linear regression analysis significant at * $p < 0.05$, ** $p < 0.01$ and *** $p < 0.001$.

^a Specific indirect effect.

^b Mediated effect by percent.

- No statistical significant mediated effect.

6.0 Discussion

This chapter will discuss the study's sample, methods and results, which leads to the conclusion and implications for further research in chapter 7. The sample and methods of the ESSENS study will further be discussed in relation to the validity and reliability of the study.

6.1 Discussion of methods

6.1.1 Sample and recruitment

The study population in the ESSENS study was 8th graders in Øvre Romerike. There was a high response rate of schools, with 11 of the 12 invited schools participating in the study. The participation rate of the 8th graders was 64%. The sample of the ESSENS study was from a specific geographic region, and results can therefore only be generalized to this specific area.

Participation rate schools

The high response rate among schools in Øvre Romerike is unlike other school-based studies (Ball et al., 2009; Bjelland et al., 2011; Zarnowiecki, Parletta, & Dollman, 2015). In the HEIA study, which was conducted in seven counties surrounding Oslo, only 21% of the schools invited participated in the study (Bjelland et al., 2011). As another example, school participation in South Australia declined from 85% in 2000 to 45% in 2008 (Dollman, Ridley, Magarey, Martin, & Hemphill, 2007; Zarnowiecki, Sinn, Petkov, & Dollman, 2012). The high representation of the schools may be due to the collaboration with the public health project FØR in Øvre Romerike. The schools might be familiar with this public health project and therefore positive to contribute to research in their local community. The relatively small target population, of six municipalities, may also be a contributing factor to the high participation rate of the schools. The principals may have perceived the study to be more specifically relevant for their school and area, compared to if it was a larger national study. Several other factors may also have contributed to the high participation rate among the schools. The study was first presented in a meeting with the school-leaders from the invited municipalities, and an e-mail with information was then sent to the respective principals. Starting the recruitment this high up in the school system may have been effective. The way the master students visited the schools physically in the recruitment process, may also have contributed to a higher participation rate compared to if the communication and invitation had

been only on e-mail or telephone. Also in other studies, recruitment and data collection done face-to-face have been reported to contribute to higher participation rates, compared to studies that use less personal forms of contact (Galea & Tracy, 2007).

Participation rate students

Parental consent was received from 67% of the invited students, and a total of 740 8th graders participated in the study, representing 64% of the invited participants. This can be considered a relatively high participation rate, taken in consideration a general decline in participation rates in cross-sectional studies in recent years (Galea & Tracy, 2007; Veierød & Thelle, 2013; Zarnowiecki et al., 2015). Cross-sectional school-based studies, conducted both in Norway and other countries, have had lower participation rates, ranging from 33% to 47% (Ball et al., 2009; Bjelland et al., 2014; Timperio et al., 2008; Zarnowiecki et al., 2015). The Family and Dietary habits project, that was conducted in Oslo and four municipalities in Akershus County among 13 to 15 year-old students in 2013, had a participation rate of 39% (Bjelland, 2014), which is considerably lower than in the ESSENS study. In the ESSENS study the parents received electronic reminder for the consent form, and the master students visited the classes physically to encourage for participation, which may have contributed to a relatively high response rate. Reminders on participation may often increase participation rate by 10-15% (Hjartåker & Lund, 2013). However, the master students did not visit the 8th grade classes in two of the schools because it was inconvenient for these schools in the time period of the recruitment. The response rates in these two schools were 42% and 79%, which also indicate the importance of each school's priority of the study, and the staffs' own follow-up of parents and students in the recruitment process.

Due to lack of data, it is not possible to compare those who did not participate in the study and those who did at the individual level. However, compared to the educational level in Øvre Romerike in general, there may be an over-representation of high educated parents in the study. In 2014, data from Akershus County showed that the percentage distribution of educational level in Øvre Romerike with low, medium and high educational level were 77.1%, 18.1% and 4.8% respectively (Akershus fylkeskommune, 2016), compared to the sample in our study with 40.2%, 34.3% and 25.5%, with low, medium and high parental educational level. However, the numbers from 2014 represent the population in Øvre Romerike over 16 years of age, which includes young people who still have not achieved

higher education as well as old people among whom educational level might be lower than younger generations of adults. This must therefore be taken in consideration. The parents in our sample are most likely in the age range of 35 to 55. The results may however possibly indicate a higher socioeconomic position than average among the participants in our study. Another study conducted in the same area also had similar distribution of parental educational level as in our sample, with 66% of the participants with education >13 years (Bjelland et al., 2014). Under-representation of low educated participants is in line with previous studies (Tolonen, Dobson, & Kulathinal, 2005; Turrell, Patterson, Oldenburg, Gould, & Roy, 2003; Zarnowiecki et al., 2015). It is also shown that individuals more concerned with health and diet may be more interested in responding to nutrition research, leading to a self-selection bias. It is further shown that low SEP individuals make up the majority of non-respondents in such surveys (Berg, Jonsson, Conner, & Lissner, 1998). The ESSENS study may also have this type of selection bias, leading to an over-representation of participants with higher SEP and more healthy dietary behaviors. Further, the proportion of ethnic minorities in our sample is lower than in the general population in Øvre Romerike, which is 16.6%, compared to a total of 9.2% in the ESSENS study. Ethnic minorities are defined as being born abroad, or having two parents born outside Norway (Akershus fylkeskommune, 2016).

6.1.3 Study design

The ESSENS study had a cross-sectional design. This type of design is well suited to describe the prevalence of different health behaviors, health outcomes and correlates of these outcomes, and to be used as a basis for the development of hypotheses for further studies with different designs (Coggon, Rose, & Barker, 2003; Johannessen, Tufte, & Kristoffersen, 2006). A cross-sectional design was considered appropriate for the ESSENS study, since the main goal was to describe the prevalence of dietary behaviors and explore possible related correlates. It was also appropriate for the limited timeframe of a master thesis. However, since the variables are measured at the same time it is not possible to make conclusions about direction of effects and potential causality of associations (Coggon et al., 2003; Ringdal, 2013; Veierød & Thelle, 2013).

6.1.4 Instruments/measurements

Data were collected through a web-based questionnaire. Parental educational level was in addition collected through a consent form. A questionnaire makes it possible to retrieve information from a large sample (Dalland, 2007), and there are several benefits of using it. A questionnaire is relatively inexpensive, easy to administer and is an effective and quick method to conduct surveys (Johannessen et al., 2006; Wendel-Vos, Schuit, Saris, & Kromhout, 2003). However, measurement errors may weaken the reliability (Ringdal, 2013). One advantage using a web-based questionnaire, instead of print, is less risk for errors during data entry to statistical software. By using an electronic questionnaire, data was transferred to SPSS from Limesurvey, which provide accuracy and increase reliability by avoiding punching errors. The master students punched the parental educational level in SPSS. To reduce the risk of errors one master student read the correct numbers, while the other punched.

To ensure high completion rate of the questionnaire it is important that it is not too extensive and time-consuming to fill out (Dalland, 2007). It is important to have a sufficient number of questions, although it should not be so many that it discourages the participants to complete (Johannessen, 2009). Most of the participants in the ESSENS study answered the whole questionnaire, suggesting that it was not perceived as too long or time consuming. The fact that the survey was done at school and not in the students free time, may also have contributed to the completion of the questionnaire. Questionnaires that were not completed by the participants were mainly due to computer problems.

Questions in the ESSENS study were adapted and modified from validated questionnaires on diet and health that has been used in the same target group earlier. To use questions from other questionnaires used in similar studies can be a great advantage, as it makes it easier to compare the results with other studies (Johannessen, 2009). Good knowledge about previous used questions, as well as knowledge about the target group in the study, are also preconditions for good reliability (Haraldsen, 1999). It is important to adapt the questions that are used to the age of the target group, and to keep the questions in a conversational and understandable language (Dalland, 2007). In the ESSENS questionnaire, some of the questions were modified to Norwegian conditions, by use of examples that are familiar to Norwegian adolescents. Examples more relevant for the target group might make it easier to answer the questions, but it may also change the meaning of the questions, and therefore lead to other answers than the original question (Veierød & Thelle, 2013). Translated

questionnaires validated in other languages, may require new validation in the current study population (Veierød & Thelle, 2013). It is argued that in some cases, only a small inaccurate translation may completely change what the questions ask about, and any translation of a questionnaire should therefore be retested to clarify reliability and validity (Friis, Andreassen, & Melle, 2013). This was not done in the ESSENS questionnaire, and may therefore be a weakness of the measures that have not previously been validated in Norwegian adolescents.

Most questions in the ESSENS study had answer categories in a scale with five values. An advantage by entering multiple values is that the participants are given the opportunity to nuance their answers by highlighting the value that best reflects their opinion (Johannessen, 2009). There is no definitive answer on how many values one should have. Three values may not capture enough variety and become too broad, while four values restrict the possibility to respond to a neutral category. Having at least five values may however provide opportunities to make more extensive statistical analyses (Johannessen, 2009).

A negative aspect using questionnaires is that they rely on self-reports. Bias concerning recall and social desirability may occur, resulting in over-reporting or under-reporting of e.g. dietary behaviors, which may weaken the validity (Brener, Billy, & Grady, 2003; McMurray et al., 2004; Zarnowiecki et al., 2015). In addition, adolescents may deliberately avoid answering questions or answer falsely if the questions are too sensitive (Brener et al., 2003). Factors presumed to influence the bias of social desirability include the participants' perceptions of the level of confidentiality and privacy, and if there are other people present when the questions are answered (Brener et al., 2003). Confidentiality and anonymity were ensured in the study by the use of a self-administrated web-based questionnaire. All participants had their own computer, and to the extent it was possible, they had a reasonable distance between each other, which ensured privacy. Still, inaccuracies arising from recall may occur in all dietary assessment methods (Johnson, 2002). However, when portion sizes are not assessed, less risk of recall bias have been found (Kolodziejczyk, Merchant, & Norman, 2012). The dietary behaviors, with the exception of soft drinks with sugar, were assessed using frequencies and not amounts, which might have increased the reliability.

Commonly used assessment methods of dietary intake in large research populations include food frequency questionnaires (FFQs), food records and 24-hour recalls (Johnson, 2002). Food frequency questionnaires has been used in a number of large cross-sectional studies such as the Pro Green study (Lynch et al., 2014), the HBSC study (Fismen et al., 2016), the

ENERGY project (Brug et al., 2012), as well as the HEIA study (Lien et al., 2010). The FFQ provides information about usual food intake, and is a very commonly used assessment method for dietary intake in epidemiological studies (McPherson, Hoelscher, Alexander, Scanlon, & Serdula, 2000). FFQs can be used to rank the participants by intake levels, and may be used to predict health outcomes (Haraldsdottir et al., 2005; McPherson et al., 2000). On the other hand, they do not give detailed information about portion sizes and exactly amount consumed, and will at best only indicate the actual intake (Willett, 2013). Another limitation regarding FFQs can be the difficulties comparing studies if different FFQs are used (Willett, 2013). However, the food frequency questions in the ESSENS study were adapted from the HEIA study (Lien et al., 2010), and therefore make comparison across studies possible. On the other hand, FFQs can have a possible lower validity compared to other diet assessment methods, like 24-hour recalls and dietary records (Willett, 2013). In spite of this, FFQs has proven to be a good measuring tool for dietary intake among adolescents from approximately 12 years of age and above, but with lower validity among younger children (Willett & Lenart, 2013).

There may be some potential limitations regarding the questions on intake of carbonated soft drinks with sugar, as they only included soda. The sale of energy drinks in Norway has increased rapidly the last decade (Mattilsynet, 2011). Therefore, not including energy drinks in the questionnaire, may have underestimated the intake of soft drinks with sugar. The questionnaire in the ESSENS study also asked for intake of squash and juice. These questions were however not included in our analyses, because previous studies have shown that adolescents may have problems separating squash and juice with sugar and without sugar (Wind, Bobelijn, De Bourdeaudhuij, Klepp, & Brug, 2005). Further, conducting the study in late November and December may have influenced the results on dietary intake, since the time before Christmas often includes celebrations with unhealthy food and snacks. However, the questions on dietary intake assess general intake over a week, which hopefully lead to answers of the participants' usual behaviors. Parental educational level, reported by parents, was used as indicator of SEP. Parental occupation, education and income were not asked about in the questionnaire, due to children and adolescents' known difficulties in self-reporting of parental SEP (Currie et al., 2008; Nilsen et al., 2010).

6.1.5 Pilot

A pilot test was conducted before the data collection to detect deficiencies and to correct errors in the survey (Haraldsen, 1999). Pilot tests are also useful to identify dropout problems and problems with the questions, as well as test practical arrangements (Haraldsen, 1999). The pilot-test was helpful to finalize the questionnaire. It gave valuable feedback on the length of the questionnaire, and was a good rehearsal for communicating with the target group. The pilot also helped to get a sense of which questions that could be confusing for some students. A disadvantage of the pilot test was that it was done on paper, instead of electronically. Due to this, it was not possible to test how long time the students would use conducting the electronic questionnaire, and it was also not possible to test how the data from Limesurvey would appear in SPSS.

6.1.6 Data collection

The data collection was conducted in late November and December. The master students were present in all classes during the survey. The validity may have been strengthened by the master students being available to answer all questions regarding the questionnaire, clarify misunderstandings and ensure that all students answered individually.

Being present during the data collection was also an advantage if computer problems occurred. The master students found procedures to prevent loss of data if data problems arose, and were able to help the students in such cases. Nonetheless, some missing data occurred due to loss of Internet, or if the students by mistake logged off the survey, and did not have time to start over again.

A limitation regarding the data collection was that the link to the questionnaire had to be posted on the class' "It's learning" portal by the teachers. This was a disadvantage, both because the master students did not know specifically where the link was put on the portal, and because some of the teachers forgot to post it, which therefore led to delays in the data collection. However, this was a minor problem. Another limitation was that the students had to write their correct ID numbers in the questionnaire themselves, to be able to link them with their parents' educational level. A possible solution to both limitations could have been to send a personal link to each student. However, because of the limited timeframe there was not enough time to collect each participant's e-mail address before the data collection.

6.1.7 Statistical analyses

Parametric tests were conducted for the statistical analyses. Parametric tests are more accurate and have higher strength, compared to non-parametric tests (Pallant, 2010; Ringdal, 2013). On the other hand, they are based on the assumption that the data are normally distributed, and are therefore more vulnerable to extreme values (Ringdal, 2013). However, this is mainly a problem for small samples. Bias is reduced in large samples when using parametric tests. This is due to the central limit theorem, which explains how data will approach a normal distribution the larger a sample is (McCluskey & Lalkhen, 2007; Ringdal, 2013). There are different recommendations about how large a sample should be, but a sample above approximately 200 people will reduce the bias (Tabachnick & Fidell, 2007). Based on the fact that the ESSENS study had a large sample of 728 participants, in addition to that preliminary parametric and non-parametric tests showed similar significant values, parametric tests were chosen for the analyses.

One assumption for ANOVA and t-test is homogeneity of variance, which indicates equal variance in the groups that are compared (Pallant, 2010). The assumption of equal variance was violated in the parental educational groups' intake of unhealthy snacks (table 4), as well as for the correlates of most of the dietary behaviors (table 5). This violation might be due to the non-normally distributed data. However, in the preliminary analysis where both parametric and non-parametric tests were conducted, the results showed similar significant scores, indicating reliable results.

Univariate and multivariate regression analyses were conducted to identify the correlates association with the dietary behaviors. Univariate regression analyses were conducted to identify each independent correlate and socio-demographic variable's association with the dietary behaviors. It has been recommended to only use significant variables from the univariate analysis in further analyses, to remove noise from the analysis and increase the significance level (Andersen & Bro, 2010; Løvås, 2013). It has also been suggested that it may be an advantage to include other variables than only the ones of primary interest, because it can increase the precision of tests and estimates (Weisberg, 2013). However, if too many variables are included it may decrease the precision (Weisberg, 2013). All correlates and socio-demographic variables were entered in the multivariate regression models. A theory-based approach was used to select candidate variables for inclusion in the models. This choice was discussed with the supervisors, and since all the correlates showed significant associations with the dietary behaviors in univariate analyses, it was decided to include all

variables in multivariate analyses.

The highest parental educational level, or the one available, was used as indicator of SEP, which may not necessarily represent the family's socioeconomic position in relation to dietary behaviors. Some studies show that maternal education has a pronounced role for children's dietary behaviors (Johansen, Rasmussen, & Madsen, 2006; Nilsen et al., 2010; Rogers & Emmett, 2003), and may therefore be a better SEP indicator. The indicator used in the present study may therefore only be suggestive at best.

In the present study internal consistency was used to measure the reliability of the scales included in the questionnaire. Cronbach's coefficient alpha was measured for perceived accessibility of all the dietary behaviors, for parental rules for fruit, vegetables and soft drinks, and for self-efficacy for healthy eating. CCA ranged from 0.42-0.86. A CCA >0.70 is considered good (Pallant, 2010). However, the number of items in a scale affects the CCA. A low number of items will decrease the CCA, and a lower value will therefore be acceptable (Streiner, 2003). Some studies have considered CCA >0.50 to be sufficient (Lien et al., 2010). Only the scale that measured accessibility of unhealthy snacks was below a CCA value of 0.50. A test-retest would have been the most optimal measurement of reliability, but this would have been too extensive considering the limited time frame of a master thesis.

6.1.8 Two master students collaborating

This master thesis was written by two master students, which can be both an advantage and create challenges. Being two in the job of the recruitment and data collection was a great advantage. The recruitment was done in several stages, and the master students met up in person at all stages. It was an enormous job to arrange for all the visits to the schools; schedule meeting appointments suitable for the contact persons, visit the classes, in addition to plan the time it took to drive from one school to another. Communicating and coordinating all the visits to the schools would have been very comprehensive and time-consuming for one student alone. Being two also made it possible to explore several correlates overall association with the dietary behaviors in multivariate analyses, which could have been too extensive for one student writing a thesis alone. This way the results gave a fuller picture of the situation in the target group, and to what extent the correlates overall influenced the dietary behaviors. However, collaborating with a thesis can also be challenging. Choosing several variables also leads to need for a more comprehensive literature overview, and more to keep track of in the

planning and execution of statistical analyses. Further, several correlates also made it a challenge to find a balance with the scope of the thesis. It was a challenge avoiding the thesis to be too comprehensive, with risk of reducing the quality, and at the same time keep the thesis comprehensive enough to be worthy of two. The entire year of the master thesis, with all the stages included, has been a process where the students have collaborated closely and continuously. This was a deliberate choice from the beginning of the process, so the master students would gain equal insight and knowledge in all parts of the thesis.

6.2 Discussion of results

6.2.1 Dietary behaviors

The mean intake of fruit, vegetables and unhealthy snacks were 6.9, 8.7 and 4.5 times per week, respectively. Mean intake of carbonated soft drinks with sugar was 7.0 dl per week, and was the only dietary behavior with significant differences between boys and girls.

The HEIA study, conducted among 13 year-olds in 2009 found mean intake of fruit to be 9.6 times per week, vegetables 10.5 times per week and unhealthy snacks 3.5 times per week. The consumption of soft drinks was 6.1 dl per week (Gebremariam et al., 2013). In relation to our results, the mean intakes from the HEIA study showed more healthy dietary behaviors, with more frequent intake of FV and less frequent intake of unhealthy snacks and soft drinks, although the differences were not very large. The Family and Dietary habits project from 2013, conducted in Oslo and four municipalities in Akershus County among 13 to 15 year-olds, found mean intake of vegetables to be 9.5 times per week and soft drinks to be 7.0 dl per week (Bjelland et al., 2014). These findings are similar to the results in the present study. The adolescents in the HEIA study were 7th graders, and the more unhealthy dietary behaviors in the F&D project and the ESSENS study may be partly due to some deterioration in dietary habits in the transition from primary to secondary school (Verloigne et al., 2012; World Health Organization, 2012).

In relation to whether the adolescents meet dietary recommendations, our results may indicate that the dietary behaviors among the 8th graders are unfavorable. Vegetable intake of 8.7 times per week exceed just slightly more than one time per day, and may not even include one portion size (100 gram). Considering Norwegian dietary recommendations, that recommend

three portions of vegetables per day (Nasjonalt råd for ernæring, 2011), these findings indicate that the intake is lower than recommended. Our findings on fruit intake of 6.9 times per week also indicate a lower intake than recommended. Fruit intake of 6.9 times per week indicates that the 8th graders eat fruit one time a day, and recommended intake is two portions each day (Nasjonalt råd for ernæring, 2011). In relation to soft drinks with sugar and unhealthy snacks, our findings may indicate a higher intake than recommended. Soft drink intake of 7.0 dl per week equals 1 dl per day, equivalent to 10.6 grams of sugar per day (Mattilsynet, Helsedirektoratet, & Universitetet i Oslo, 2015). It is recommended that added sugar do not exceed 10E% (Nordic Council of Ministers, 2014). Ten grams of sugar is about 40 calories and equals about 2.5E% for a person who needs 2000 calories a day. However, it is important to take into consideration that squash, ice tea and energy drinks were not included in the questions on soft drinks, which indicate that the total intake of soft drinks with sugar may be underestimated. On the other hand, there has been a general decrease in soft drink consumption among Scandinavian adolescents recent years (Fismen et al., 2016), and it has been suggested that the positive trend might not reflect a total decrease in soft drinks, but instead a replacement with sugar-free alternatives (Stea et al., 2012). The Ungkost study from 2000 showed that the 8th graders almost had a mean intake of 3 dl of soft drinks with sugar a day (Øverby & Andersen, 2002). Our results may therefore indicate that soft drinks with sugar do not contribute to added sugar in the diet to the same extent as before. However, unhealthy snacks may also contribute to added sugar in the diet. Mean intake of unhealthy snacks was 4.5 times per week, but it is difficult to estimate amount based on this result. When taking these considerations into account, the overall intake of added sugar may still be higher than preferable. Further, it is also important to consider that intake of 7.0 dl of soft drinks per week and intake of unhealthy snacks of 4.5 times per week is the mean intake, which means that higher intake among parts of the sample may be of particular concern.

Soft drink consumption has been shown to be higher among boys than girls both in Europe and Norway (Brug et al., 2012; World Health Organization, 2016), which is in accordance with our findings. The ENERGY project, conducted among 10 to 12 year-old adolescents in seven European countries, including Norway, found that boys had a higher consumption of soft drinks compared to girls (Brug et al., 2012). Further, the HBSC study, conducted in 42 countries, including Norway, found that soft drinks were consumed more often on a daily basis for 13 year-old boys compared to 13 year-old girls (World Health Organization, 2016), which indicates that boys have a higher intake. Norwegian boys also have a higher

consumption of soft drinks compared to adolescents in the rest of Scandinavia (World Health Organization, 2016). One explanation for why boys consume more soft drinks than girls may be that girls in general are more concerned with health, and that girls often make healthier choices based on knowledge, as they often contribute more to food purchasing and preparation in the home (Wardle et al., 2004). Boys' higher requirement for energy may also be a factor leading them towards more energy-dense foods and drinks (Cooke & Wardle, 2005). Our results, together with the findings from the HBSC study and the ENERGY project, shows that soft drink consumption among Norwegian boys may be of concern and that future intervention for reducing intake of soft drinks should target boys in particular.

Several studies have shown that girls in general eat more fruit and vegetables than boys (Diethelm et al., 2012; Rasmussen et al., 2006; Yngve et al., 2005). However, in the ESSENS study intake of fruit and vegetables were very similar between genders, and the boys actually ate slightly more of both fruit and vegetables. The Ungkost study, from 2000, also found similar intake of FV between boys and girls, but argued that when considering boys' and girls' different energy need, girls ate more FV compared to boys (Øverby & Andersen, 2002). On the other hand, the HEIA study found a higher fruit intake among girls than boys (Bjelland et al., 2015). The 13 year-old girls had a fruit intake of 8.4 times per week, compared to the boys with 5.9 times per week (Bjelland et al., 2015). Our results therefore indicate that FV consumption is similar between genders in Øvre Romerike, and that future interventions for improving these dietary behaviors should target both girls and boys equally.

In the cross-national Pro-Greens study that was conducted in ten European countries, including Norway, results showed that intake of fruit was higher than vegetables among 11 year-olds in several countries (Lynch et al., 2014). An explanation may be that children and adolescents tend to like fruit better than vegetables, and find fruit more accessible as a snack (Lynch et al., 2014). On the other hand, our results showed more frequent intake of vegetables than fruit, and similar findings were found in the HEIA study, with higher intake of vegetables than fruit, among both 11 and 13 year-olds (Gebremariam et al., 2013). However, the Pro-Greens study measured intake by amount, and in addition, berries were included in the question on fruit, and composite dishes was not included in the question on vegetables (Lynch et al., 2014). This may have resulted in a higher total intake of fruit than vegetables in comparison to our results. Both the questions in the ESSENS study and in the HEIA study measured intake by frequency and not amount, which may give less accurate estimates on dietary intake (Willett & Lenart, 2013). For example, in Norway, it is common to have a few

slices of cucumber, tomato and/or pepper on the bread for lunch, which not necessarily is a portion size (100 gram), but counts as frequency. Our results may therefore depart from the actual intake, and the adolescents may not necessarily eat more vegetables than fruit.

The age period from 11 to 15 is a period where adolescents go through many physical, social and developmental changes, which may lead to poorer dietary behaviors (Story et al., 2002; Verloigne et al., 2012; World Health Organization, 2012). Results from the HEIA study found mean intake of fruit to be 9.8 times per week, vegetables 11.0 times per week, unhealthy snacks 3.1 times per week, and mean intake of soft drinks to be 5.3 dl per week among 11 year-old adolescents. The results from the follow up study 20 months later showed that the 13 year-olds had decreased their FV consumption to 9.6 and 10.5 times per week, and increased their snacks and soft drink consumption, to 3.5 times and 6.1 dl per week (Gebremariam et al., 2013). These results indicate that the 13 year-olds in the HEIA study engaged in more unhealthy dietary behaviors in their transition from 11 to 13 year of age. Our results also show that the 8th graders have more unhealthy dietary behaviors than the 11 year-olds in the HEIA study. Further, results from the HBSC study from 2013/2014 showed that Norwegian adolescents decreased their intake of FV and increased intake of sweets and soft drinks from the age 11 to 13 and further to the age of 15, except for girls who increased their fruit intake from the age of 13 to 15 (World Health Organization, 2016). In relation to these findings, our results may contribute to the understanding of that 13 year-olds are in a transition period with risk of developing more unhealthy dietary behaviors, and is an important target group for improving dietary behaviors.

6.2.2 Correlates and their association with dietary behaviors

Fruit and vegetable consumption

Perceived accessibility, self-efficacy for healthy eating and paternal modeling were significantly positively associated with fruit and vegetable intake in the present study. Results from the baseline survey of Fruit and Vegetables Make the Marks Project, among Norwegian 11 and 12 year-olds, showed that accessibility was among the strongest correlates of fruit and vegetable intake (Bere & Klepp, 2004), which is in accordance with our results. The master students have not found other studies looking at perceived accessibility, perceived parental modeling or self-efficacy for healthy eating in relation to FV intake among Norwegian

adolescents. An Icelandic cross-sectional study also found self-efficacy to be an important influence for fruit and vegetable intake among 11 year-olds (Kristjansdottir et al., 2006), which is in accordance with our results. It has previously been identified that fruit and vegetables are different behaviors, with different influencing factors (Kristjansdottir et al., 2006; Reinaerts, de Nooijer, Candel, & de Vries, 2007; Wind et al., 2006). Studies have found environmental factors, like accessibility, to be more important for vegetable intake, and self-efficacy to be more important for fruit intake (Kristjansdottir et al., 2006; Wind et al., 2006). One explanation can be that vegetables are often eaten with meals and not between meals, and therefore require more preparation and cooking skills, and lies more in the hands of the parents (Kristjansdottir et al., 2006). In our results, self-efficacy was the correlate with the highest association with fruit intake, but accessibility and self-efficacy were equally associated with vegetable intake. Our results are therefore in accordance with previous findings that self-efficacy may be most important for fruit intake, but not that perceived accessibility is more important for vegetable intake. Further, the Icelandic study was conducted among 11 year-olds, and our results may therefore indicate that self-efficacy for healthy eating may become a more important correlate for vegetable intake as the adolescents grow older.

In relation to permissive rules for fruit and vegetable intake, other studies have also found no association with parental rules and intake of fruit and vegetables among adolescents (Martens, van Assema, & Brug, 2005; Videon & Manning, 2003), which is in accordance with our results. A review of the scientific literature on parental modeling found parental modeling to be positively associated with adolescents' intake of fruit and vegetables (Berge, 2009; Pearson et al., 2009), which is in accordance with our results. An interesting finding in the ESSENS study was that paternal modeling, and not maternal modeling, was significantly associated with fruit and vegetable intake. The master students have not found other studies that measure parental modeling of FV intake separately by mother and father, and have therefore not found other results showing that paternal modeling is more strongly associated with adolescents' intake than maternal modeling. Other studies usually have combined maternal and paternal modeling in a scale, or have used maternal modeling alone (Berge, 2009; De Bourdeaudhuij et al., 2008; Pearson et al., 2009; Rasmussen et al., 2006). Our results may indicate that maternal and paternal modeling can influence adolescents eating behaviors differentially, and it may therefore be interesting to investigate this in future research.

Unhealthy snacks consumption

In the present study perceived accessibility and parental modeling were significantly positively associated with intake of unhealthy snacks, and self-efficacy for healthy eating and prohibitive rules were significantly inversely associated with unhealthy snacks consumption. The master students have not found other studies that have looked at accessibility, self-efficacy, parental modeling or rules and their association with unhealthy snacks intake among Norwegian adolescents. However, studies conducted in other countries have found these correlates to have important influence on children's unhealthy snacks consumption (Campbell et al., 2007; Cusatis & Shannon, 1996; De Bourdeaudhuij, 1997; Martens et al., 2005). In accordance with our results, a cross sectional study among 12 and 14 year-old Dutch adolescents found accessibility to be an important correlate of the adolescents' intake of unhealthy snacks (Martens et al., 2005). Self-efficacy for healthy eating was also a significant correlate of unhealthy snacks consumption among the 8th graders in the ESSENS study. An American cross-sectional study among high school students also found that self-efficacy for healthy eating was negatively related to the students' unhealthy snacks consumption (Cusatis & Shannon, 1996). One of the first studies to explore family food rules and adolescents dietary behaviors, among 10 year-olds, found in accordance with our results, that more permissiveness was related to higher consumption of fat and sweet foods (De Bourdeaudhuij, 1997). In relation to parental modeling, an Australian study among 12 and 13 year-old adolescents found that maternal modeling was an important correlate for boys' intake of sweet and savory snacks (Campbell et al., 2007), which is in accordance with our results.

These findings, together with our results, indicate that accessibility, self-efficacy for healthy eating, parental modeling and prohibitive rules are important correlates to target in order to reduce unhealthy snacks intake. However, several Norwegian studies looking at these correlates in relation to unhealthy snack intake is needed to draw further conclusions.

Soft drink consumption

Perceived accessibility and parental modeling were significantly positively associated with soft drink consumption. Prohibitive rules and self-efficacy for healthy eating were significantly inversely associated with soft drink consumption. Results from the HEIA study found accessibility to be an important correlate of soft drink consumption for Norwegian 11

and 13 year-olds (Totland et al., 2013b). A cross-sectional study among Norwegian 9th and 10th graders also found, in accordance with our results, home accessibility and parental modeling to be two of the most important correlates of soft drink consumption (Bere, Glomnes, te Velde, & Klepp, 2008a). In this study modeling was measured among siblings and friends in addition to parental modeling (Bere et al., 2008a). The master students have not found other studies looking at parental modeling, prohibitive rules or self-efficacy in relation to soft drink intake among Norwegian adolescents. However, in relation to prohibitive rules, the HBSC study in Belgium and Italy, among 11 to 16 year-old adolescents, found similar result. In both countries, prohibitive rules for soft drink consumption was the strongest correlate associated with soft drink intake (Verzeletti, Maes, Santinello, & Vereecken, 2010). Further, a cross sectional study among Dutch 12 to 18 year-old adolescents also found that stricter rules related to soft drink consumption was associated with lower consumption, but this association was mediated by cognitive factors (de Bruijn, Kremers, de Vries, van Mechelen, & Brug, 2007). Another cross-sectional study among 13 year-old Dutch adolescents found more restrictive parenting practice to be associated with less soft drink consumption, but this association was highly mediated by self-efficacy, parental modeling and attitude (van der Horst et al., 2007a). Although these studies imply that prohibitive rules reduce soft drink intake (de Bruijn et al., 2007; van der Horst et al., 2007a), other studies do however show that restriction can have negative effects and lead to increased preferences for the restricted foods (Birch & Fisher, 2000; Campbell et al., 2007; Fisher & Birch, 1999; Scaglioni et al., 2011). However, most of these studies are conducted among younger children and toddlers, and restrictive rules may therefore not necessarily have the same influence on 13 year-old 8th graders. Nevertheless, if a child grows up with restrictive rules from early childhood, which leads to increased preferences of certain foods, this may influence preferences and dietary behaviors in adolescence and lead to poorer dietary behaviors.

Gathering the threads

Perceived accessibility, self-efficacy for healthy eating and perceived parental modeling were significantly associated with all the dietary behaviors in the present study. Paternal modeling, and not maternal modeling, was significantly associated with FV intake. Prohibitive rules were significantly inversely associated with intake of unhealthy snacks and soft drinks.

Self-efficacy for healthy eating was significantly associated with all the dietary behaviors, which strengthens the importance of including self-efficacy when investigating correlates of dietary behaviors (Sallis et al., 2008). Self-efficacy has also been shown to be a mediator of the relationship between parental influences and dietary behaviors (Bandura, 1997; de Bruijn, Kremers, Schaalma, van Mechelen, & Brug, 2005; Pearson et al., 2012). Future Norwegian studies should include self-efficacy and look at potential mediating effects on associations between environmental correlates and dietary behaviors. However, when investigating self-efficacy in cross-sectional studies it is important to take into consideration the inability to make conclusions on direct effects. The risk of making wrong conclusions is especially seen with cognitive factors (Weinstein, 2007). People with healthy dietary behaviors may report a higher self-efficacy, which actually may be a result of the healthy behavior itself.

The models of fruit, vegetable, unhealthy snacks and soft drink intake explained respectively 18%, 23%, 18% and 30% of the variance in the dietary behaviors. The variance in the dietary behaviors are therefore not fully explained, which indicate that it is important to include several correlates to explore their overall association in future research. To the best of our knowledge, there is lack of studies among adolescents in Norway looking at the correlates and dietary behaviors explored in the present study, and there is need for more studies to enable comparisons. Our findings may however imply that the studied correlates are important to target in improving dietary behaviors among adolescents.

6.2.3 Association between socioeconomic position, dietary behaviors and their correlates

Socioeconomic differences in fruit and vegetable consumption

In the present study the high parental educational group had a higher intake of vegetables than the medium parental educational group and the medium parental educational group had a higher intake than the low parental educational group. These differences were however not significant. Fruit intake was similar between the parental educational groups.

Fruit and vegetables have been found to be more strongly associated with SEP than other food items (Dowler, 2001; Giskes, Turrell, van Lenthe, Brug, & Mackenbach, 2006; Roos,

Johansson, Kasmel, Klumbiene, & Prattala, 2001). FV intake has increased among Scandinavian adolescents the recent years (Fismen et al., 2016), but there are indeterminate findings for whether there are socioeconomic differences in these behaviors among Norwegian adolescents (Bere et al., 2008b; Fismen et al., 2016; Totland et al., 2013a). The Fruit and Vegetables Make the Marks project, conducted among Norwegian 12 to 13 year-olds, found a socioeconomic disparity in fruit and vegetables from 2002 to 2005 with both income and parental educational level as indicators of SEP, where the low SEP adolescents consumed less FV (Bere et al., 2008b). A study using HBSC results also found, in 2005/2006, that lower SEP adolescents in Norway consumed less fruit and vegetables (Fismen et al., 2016). The Family Affluence Scale³ (FAS) was however used as indicator of SEP in this study, and not parental education. On the other hand, the HEIA study did not find socioeconomic disparity in consumption of fruit and vegetables among neither 11 or 13 year-olds from 2007 to 2009 (Totland et al., 2013a). Our results showed similar intake of fruit, and non-significant differences in vegetable intake. Together this indicates that the socioeconomic disparity in FV intake among Norwegian adolescents might even out, and may not be of great concern. Despite the non-significant differences in FV intake, the results in the present study found significant differences between the parental educational groups in several of the correlates related to FV intake, and these correlates will therefore be further discussed.

In the present study accessibility, permissive rules and parental modeling of vegetable intake showed significant differences between the parental educational groups. The low parental educational group perceived lower accessibility, less permissive rules and less parental modeling of vegetables, compared to the medium and high parental educational groups. For fruit intake, permissive rules and parental modeling showed significant differences between the parental educational groups. The low parental educational group perceived less permissive rules and less parental modeling compared to the medium and high parental educational groups. Review of the literature shows that socioeconomic position consistently has been associated with accessibility of fruit and vegetables at home (Zarnowiecki et al., 2014). A study from Fruit and Vegetables make the Marks, among 12 to 13 year-old Norwegian adolescents, found accessibility to be the strongest mediator for SEP differences in FV intake (Bere et al., 2008b). The same study found that adolescents from high SEP families reported stronger role models for FV intake compared to the adolescents from low SEP families (Bere

³ A measure of material wealth derived from family household characteristics (Currie et al., 2008; Fismen et al 2014). The scale was originally developed to be a supplementary measure for adolescents' socioeconomic position, due to difficulties in self-report of parental SEP (Currie et al., 2008).

et al., 2008b). These findings are in accordance with our results, showing that both accessibility and parental modeling are potential correlates that can contribute to explain SEP differences in vegetable intake, and that parental modeling can contribute to explain SEP differences in fruit intake. Further, our results also showed that the low parental educational group perceived less permissive rules for fruit and vegetable intake compared to the medium and high parental educational groups. The master students have not found other studies looking at socioeconomic differences in permissive rules related to vegetable intake.

Despite the significant differences in the correlates related to fruit and vegetables, there were no significant differences in intake of FV, suggesting that the differences in the correlates were not large enough to lead to important socioeconomic differences in the behaviors. Since the correlates are “perceived” and not actual, it might also be that there are actually less differences in reality but the perceptions among the adolescents from different socioeconomic position might vary.

Socioeconomic differences in unhealthy snacks consumption

Results in the present study found that the 8th graders in the low and medium parental educational groups had a higher intake of unhealthy snacks compared to the 8th graders in the high parental educational group, but this difference was not significant.

A study looking at trends among Nordic adolescents, using results from the HBSC study, found no socioeconomic differences in intake of sweets among Norwegian adolescents from 2005 to 2009 (Fismen et al., 2016). However, the FAS, and not parental educational level, was used as SEP indicator in this study. In accordance with this finding, the HEIA study also found no socioeconomic differences in intake of unhealthy snacks from the age of 11 to 13 (Totland et al., 2013a). These studies may indicate that socioeconomic differences in unhealthy snacks among Norwegian adolescents may not be of concern. The master students have not found other studies investigating SEP differences in unhealthy snacks consumption among Norwegian adolescents. Prohibitive rules related to unhealthy snacks intake showed significant differences between the parental educational groups in the present study. Based on the differences in unhealthy snacks intake between the parental educational groups, although non-significant, significant differences in prohibitive rules will be further discussed.

The results in the present study found significant differences in prohibitive rules related to consumption of unhealthy snacks. The high parental educational group perceived more prohibitive rules than the medium parental educational group, and the medium parental educational group perceived more prohibitive rules for intake of unhealthy snacks compared to the low parental educational group.

Review of the literature has reported indeterminate associations with SEP and rules related to food consumption (Zarnowiecki et al., 2014). The master students have not found other studies looking at socioeconomic differences in relation to restrictive rules and unhealthy snacks consumption among Norwegian adolescents. However, in accordance with our findings, a cross-sectional study conducted among mothers of 7 to 9 year-old children in the Netherlands, Belgium and Germany, found that higher educated mothers restricted their children's intake of sweets more often in comparison to lower educated mothers (Hupkens et al., 1998). However, in this study, rules related to sweets were measured by mothers answering three alternatives; if they believed their child should eat sweets, if they restricted their child's consumption of sweets, or whether their child was allowed to eat sweets whenever they wanted (Hupkens et al., 1998). On the other hand, a cross-sectional study among American 7 to 12 years-old children and adolescents, found that low SEP parents restricted more snacks and unhealthy foods (Cardel et al., 2012). Restriction was measured by parents answering a five-point Likert scale, with the statements: "I have to make sure my child does not eat too many sweets/fat foods/too much of his/her favorite foods" (Cardel et al., 2012). The two studies found different results, but they did however use different methods to measure restriction, and both were by parents' reports and not by adolescents' reports. These findings indicate that there is need for more studies with similar methods for measuring socioeconomic differences in parental rules for unhealthy snacks. Our results may however indicate that less prohibitive rules among the low and medium parental educational groups may contribute to socioeconomic differences in unhealthy snacks consumption among adolescents. However, intake of unhealthy snacks did not show significant differences in the present study. Based on the fact that there are few Norwegian studies looking at SEP differences in unhealthy snacks intake, future research should investigate if this dietary behavior is a socioeconomic challenge.

Socioeconomic differences in soft drink consumption

Soft drink intake was the only dietary behavior that showed a significant difference between the parental educational groups, where the low parental educational group had higher intake of soft drinks compared to the high parental educational group.

Although there is a positive trend with reduced consumption of soft drinks in Norway (Fismen et al., 2016; Stea et al., 2012), there is still a social gradient in this dietary behavior (Brug et al., 2012; Stea et al., 2012; Totland et al., 2013b). Soft drink consumption has been inversely associated with SEP among Norwegian adolescents in studies that use parental education (Nilsen et al., 2010; Skardal, Western, Ask, & Overby, 2014; Totland et al., 2013b), parental occupation (Vereecken, Inchley, Subramanian, Hublet, & Maes, 2005), and cultural capital (Fismen, Samdal, & Torsheim, 2012) as indicators. In the HEIA study, the 13 year-olds with low parental education consumed 7.6 dl of soft drinks per week compared to 5.4 dl per week among those with high parental education (Totland et al., 2013b). The ENERGY project, conducted among 10 to 12 year-old adolescents in seven European countries, including Norway, also found that adolescents with low parental education consumed more soft drinks (Brug et al., 2012). The results from Norway showed that adolescents with low parental education consumed 233 ml per day, compared to adolescents with high parental education with consumption of 167 ml per day (Brug et al., 2012). The Fruit and Vegetables Make the Marks project, conducted among Norwegian 11 and 12 year-old students, also found SEP differences in soft drink consumption. The adolescents with lower educated parents reported to consume soft drinks 2.4 times a week, compared to 1.8 times a week among those with higher educated parents (Stea et al., 2012). On the other hand, a study looking at SEP differences among Nordic adolescents, using results from the HBSC study, found no SEP differences in consumption of soft drinks (Fismen et al., 2016). However, the Family Affluence Scale was used as indicator of SEP in this study (Fismen et al., 2016), which may indicate that FAS might not be a good measure for socioeconomic differences in soft drink consumption among Norwegian adolescents. Review of the literature has identified SEP differences in soft drink consumption among children below five years of age (Mazarello et al., 2015). Further, results from the HEIA study found no association between parental educational level and changes in soft drink consumption over 20 months among 13 year-olds (Totland et al., 2013b), which can indicate that SEP differences in soft drink consumption are established before this age. Based on these results, it may therefore be important to target SEP differences in soft drink consumption already in early childhood.

Results from the present study found that the 8th graders in the low parental educational group perceived higher accessibility, higher parental modeling and less prohibitive rules related to soft drink consumption, compared to the high parental educational group. These differences in prohibitive rules, accessibility and parental modeling between the parental educational groups may partly contribute to explain the SEP differences in soft drink consumption.

In relation to accessibility of soft drinks, the HEIA study also found higher perceived accessibility of soft drinks among adolescents with low parental educational level (Totland et al., 2013b). It is important to acknowledge the importance of accessibility in low SEP households, as it is easier to choose food that is made accessible, compared to if it only is available in the home (Zarnowiecki et al., 2014). This can in particular be a challenge in an environment where there is higher availability of unhealthy foods and drinks that are packaged in a more accessible form, which can be more common in lower SEP households (Zarnowiecki et al., 2014).

In relation to rules related to soft drink consumption the master students have not found other Norwegian studies looking at prohibitive rules for soft drink consumption in association with SEP. This may imply the importance of exploring this area closer. However, a study among 2 to 7 year-old Flemish preschool children found that mothers with higher educational level engaged in more restrictive rules and that the children had a lower intake of soft drinks compared to the children with lower parental educational level (Vereecken, Keukelier, & Maes, 2004). However, the SEP difference in restrictive rules was not statistically significant (Vereecken et al., 2004). Another study conducted in the Netherlands, Belgium and Germany among mothers of 7 to 9 year-old children, also found that higher educated mothers restricted their children's intake of soft drinks more often in comparison to lower educated mothers (Hupkens et al., 1998). Both studies have similar findings as our results, where the 8th graders with high parental education perceived more restrictive rules in relation to soft drink consumption. A permissive parenting style has shown that it may lead to poorer dietary behaviors in children and adolescents (Zarnowiecki et al., 2014). These findings together with our results therefore indicate that more prohibitive rules among higher SEP parents may contribute to socioeconomic differences in soft drink consumption among adolescents.

In the present study, the high parental educational group experienced less modeling of soft drinks, compared to the medium and low parental educational group. The master students have not found other studies looking at SEP differences in relation to modeling of soft drink

consumption among Norwegian adolescents. Other studies have however found that lower SEP parents in general model more unhealthy behaviors than higher SEP parents (Ball et al., 2009; Bere et al., 2008a). This is line with evidence showing that adults with lower socioeconomic position have more unhealthy dietary behaviors than adults with higher socioeconomic position (Irala-Estévez et al., 2000; Zarnowiecki et al., 2014). Our results can indicate that accessibility, prohibitive rules and parental modeling may be correlates contributing to socioeconomic differences in soft drink consumption.

Based on these findings of socioeconomic differences in soft drink consumption a mediation analysis was conducted, where the aim was to identify the potential mediating effects of perceived accessibility, perceived prohibitive rules and perceived parental modeling on the association between parental educational level and intake of soft drinks. As there were not found SEP differences in self-efficacy for healthy eating it was not included in the mediation model. The results from the mediation analysis showed a non-significant total direct effect between high parental educational level and the 8th graders soft drink intake. Hence, this relationship seemed to be fully mediated by accessibility, prohibitive rules and parental modeling. The results further showed that accessibility explained 43%, prohibitive rules explained 36% and parental modeling explained 8% of the variance in soft drink consumption between the high parental educational group and the low parental educational group.

In accordance with our results, other studies have also found accessibility to be a strong mediator for SEP differences in soft drink consumption (De Coen et al., 2012; Hilsen, te Velde, Bere, & Brug, 2013; Totland et al., 2013b). Results from the HEIA study showed that perceived accessibility reported by mothers and adolescents partly mediated the association between parental educational level and soft drink intake among 13 year-old adolescents, by explaining 39% of the total effect. The multiple mediation analysis in the HEIA study also included perceived accessibility reported by fathers as a potential mediator, but a mediating effect was not found (Totland et al., 2013b). A study from Fruit and Vegetables Make the Marks project, conducted among Norwegian 14 and 15 year-olds, found accessibility and modeling to be the strongest mediators for socioeconomic position and soft drink consumption, by explaining 69% and 44% of the total effect, followed by preferences and attitudes explaining 31% and 30% respectively (Hilsen et al., 2013). However, future educational plans were used as indicator of SEP in this study, and modeling was measured by modeling of friends and siblings in addition to parental modeling (Hilsen et al., 2013). Another study, conducted among Flemish 3 to 7 year-old children, explored potential

mediating effects of the association with maternal educational level and soft drink consumption. Home availability, accessibility, permissiveness and avoidance of negative modeling were included as potential mediators. Accessibility, permissiveness and availability significantly mediated the association, with mediating effects of 51%, 31% and 16% respectively (De Coen et al., 2012). Parental discouragement and avoidance of negative modeling did not mediate SEP differences in soft drink intake (De Coen et al., 2012). Avoidance of negative modeling was in this study measured by the parents answering the question on a five-point scale: “If I would like to drink soft drinks, I would restrain myself because of the presence of my child” (De Coen et al., 2012). Our results can in relation to these findings contribute to the understanding of perceived accessibility and parental rules as particular important mediators for SEP differences in soft drink consumption. Parental modeling had the lowest percentage mediating effect of 8% in our results. In comparison a previous study did not find a mediating effect of parents’ avoidance of negative modeling (De Coen et al., 2012). Although these two different measures on parental modeling may not be of best comparison, the result may however indicate that parental modeling has a less important influence on socioeconomic differences in soft drink consumption.

In our results, accessibility mediated 27% of the difference in soft drink consumption between the low and medium parental educational groups, despite a non-significant difference in intake. A significant mediating effect can occur even if there is no significant association between the independent and the dependent variable (Hayes, 2009). The total effect is the sum of several paths of direct and indirect influences, and all may not be included in a mediation model. Potential correlates can have both positive and inversely effects on the association between X and Y, and may therefore cancel each other out. The total indirect effect of the correlates can therefore indicate no association between X and Y, although a specific indirect effect may exist (Hayes, 2009). Our findings therefore indicate that other correlates, that not are included in the present thesis, contribute to explain differences in soft drink intake between parental educational levels. Future research therefore needs to include several correlates to explore mechanisms explaining these potential differences.

The results in the present study did not show significant differences in self-efficacy for healthy eating between the parental educational groups, which was unexpected considering that self-efficacy has been identified as an important mediator for SEP differences in dietary behaviors (Ball et al., 2009; van der Horst et al., 2007a). Nevertheless, a study using Norwegian results from the Pro-Children study did also not find SEP differences in self-

efficacy for healthy eating among 11 year-old adolescents (Sandvik, Gjestad, Samdal, Brug, & Klepp, 2010). It has been suggested that environmental correlates might be more important for SEP differences in unhealthy dietary behaviors and that cognitive correlates might be more important for SEP differences in healthy dietary behaviors (Ball et al., 2009). In the present study, self-efficacy was measured towards healthy eating, and may therefore not necessarily be a good measure as a potential mediator of unhealthy dietary behaviors.

7.0 Conclusions and further implications

The findings in the ESSENS study indicate that intake of fruit and vegetables was lower than recommended, and intake of unhealthy snacks and soft drinks was higher than preferable among the 8th graders. Intake of fruit, vegetables and unhealthy snacks were similar between genders, but soft drink consumption was particularly a challenge among the boys. The study showed that home accessibility, paternal modeling and self-efficacy for healthy eating were important correlates of fruit and vegetable intake. Home accessibility, prohibitive rules, parental modeling and self-efficacy for healthy eating were important correlates of intake of unhealthy snacks and soft drinks. Soft drink consumption showed significant differences between the parental educational groups, where the adolescents with low parental educational level had a considerable higher intake than the adolescents with high parental educational level. These differences were largely explained by perceived accessibility at home and prohibitive rules regarding soft drink consumption. Parental modeling of soft drinks also contributed to explain these differences, but to a lesser extent. Intake of fruit, vegetables and unhealthy snacks did not show significant differences between the parental educational groups, but significant differences were found in several of the corresponding correlates.

The findings highlight the importance of the home environment for adolescents' intake of fruit, vegetables, unhealthy snacks and soft drinks with sugar. Future interventions aiming to improve dietary behaviors, targeting the home environment in Øvre Romerike, should focus on accessibility, parental rules, parental modeling and self-efficacy for healthy eating as these correlates have shown to be important for the dietary behaviors among the adolescents. Interventions targeting socioeconomic differences should focus on soft drink consumption, and accessibility and prohibitive rules as the most important correlates in reducing these differences.

Future interventions should focus on parents, by encourage them to be good role models, engage in healthy dietary behaviors and practice rules that decrease unhealthy dietary behaviors among the adolescents. Initiatives should be implemented from early age, and can be done by performing campaigns that aim to improve nutrition knowledge, attitudes and norms for healthy eating, at arenas that reach parents, such as health stations, kindergartens and schools. It is also important with public health initiatives in the local community that reach all socioeconomic groups, with e.g. community gardens, cooking classes and nutrition courses.

The findings in the present study are limited to the correlates studied, and future research should include a broader range of correlates to explore their overall influence on dietary behaviors. To the best of the master students' knowledge few Norwegian studies look at the association between the dietary behaviors and potential correlates explored in the present study. The need of several studies is of particular importance considering that our results showed socioeconomic differences in several correlates related to fruit, vegetables and unhealthy snacks intake, despite that our results at the same time indicate that socioeconomic differences in these dietary behaviors are not of concern.

Based on the cross-sectional study design, future research should also consider longitudinal or experimental studies to be able to find causal relationships.

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Appendices

Appendix 1: Questionnaire – relevant survey items

Appendix 2: Fact-sheet and e-mail to school principals

Appendix 3: Informed consent form to school principals

Appendix 4: Information letter to students

Appendix 5: Informed consent form to parents (including items on parental educational level)

Appendix 6: Ethical approval from Norwegian social science data services

Appendix 1

Questionnaire – relevant survey items

ESSENS Studien

Høgskolen i Oslo og Akershus

Spørreskjema om mat, drikke, fysisk aktivitet og stillesitting

Kjære elev,

Takk for at du hjelper oss med å svare på disse spørsmålene om kosthold,
fysisk aktivitet og stillesitting.

Det er frivillig å svare på disse spørsmålene, og alle svarene du gir er
hemmelige. Ingen på skolen din, eller andre du kjenner, får vite hva du har
svart.

Det finnes ingen riktige eller gale svar. Bare svar det som passer for deg og din hverdag.

Spørsmål som er merket med stjerne (*) er obligatoriske og må besvares før
du kan gå videre.

Lykke til!

Det er 51 spørsmål i denne undersøkelsen.

Skole og ID-nummer

Skriv skolens navn *

Vennligst skriv her:

Skriv ID-nummeret ditt *

Vennligst skriv her:

Noen spørsmål om deg**Er du jente eller gutt? ***

Velg kun en av følgende:

- Jente
 Gutt

Hvilket år er du født? *

Velg kun en av følgende:

- 2000
 2001
 2002
 2003
 2004
 Annet

I hvilken måned har du fødselsdag? *

Velg kun en av følgende:

- Januar
 Februar
 Mars
 April
 Mai
 Juni
 Juli
 August
 September
 Oktober
 November
 Desember

I hvilket land er du født? *

Velg kun en av følgende:

- Norge
- Annet land

I hvilket land er moren din født? *

Velg kun en av følgende:

- Norge
- Annet land

I hvilket land er faren din født? *

Velg kun en av følgende:

- Norge
- Annet land

Noen spørsmål om frukt, grønnsaker og snacks**Hvor ofte spiser du vanligvis FRISK FRUKT?**

Velg kun en av følgende:

- Aldri/sjelden
- Mindre enn 1 gang i uken
- 1-2 ganger per uke
- 3-4 ganger per uke
- 5-6 ganger per uke
- 1 gang per dag
- 2 ganger per dag
- 3 ganger eller mer per dag

Hvor ofte spiser du vanligvis RÅ GRØNNSAKER (f.eks. gulrot, tomat, salat)?

Velg kun en av følgende:

- Aldri/sjelden
- Mindre enn 1 gang i uken
- 1-2 ganger per uke
- 3-4 ganger per uke
- 5-6 ganger per uke
- 1 gang per dag
- 2 ganger per dag
- 3 ganger eller mer per dag

Hvor ofte spiser du vanligvis VARME GRØNNSAKER (IKKE poteter)?

Velg kun en av følgende:

- Aldri/sjelden
- Mindre enn 1 gang i uken
- 1-2 ganger per uke
- 3-4 ganger per uke
- 5-6 ganger per uke
- 1 gang per dag
- 2 ganger per dag
- 3 ganger eller mer per dag

Hvor ofte spiser du vanligvis SJOKOLADE, GODTERI eller IS?

Velg kun en av følgende:

- Aldri/sjelden:
- Mindre enn 1 gang i uken
- 1-2 ganger per uke
- 3-4 ganger per uke
- 5-6 ganger per uke
- 1 gang per dag
- 2 ganger eller mer per dag

Hvor ofte spiser du vanligvis FETTHOLDIG SNACKS (f.eks. potetgull, salte peanøtter)?

Velg kun en av følgende:

- Aldri/sjeldent
- Mindre enn 1 gang i uken
- 1-2 ganger per uke
- 3-4 ganger per uke
- 5-6 ganger per uke
- 1 gang per dag
- 2 ganger eller mer per dag

Hvor ofte spiser du vanligvis SØTE KJEKS, BOLLER, SKOLEBRØD, MUFFINS og lignende?

Velg kun en av følgende:

- Aldri/sjeldent
- Mindre enn 1 gang i uken
- 1-2 ganger per uke
- 3-4 ganger per uke
- 5-6 ganger per uke
- 1 gang per dag
- 2 ganger eller mer per dag

Nå kommer noen spørsmål om hva du drikker på HVERDAGER

På HVERDAGER (mandag til fredag), hvor ofte drikker du brus MED sukker (f.eks Cola, Solo)?

Velg kun en av følgende:

- Aldri/sjelden
- 1 dag
- 2 dager
- 3 dager
- 4 dager
- Hver hverdag

Når du drikker brus MED sukker på hverdager, hvor MYE pleier du å drikke per gang?

(1/2 liter = 3 glass)

Svar kun på dette hvis følgende betingelser er oppfylt:

Svarst var '2 dager' eller '3 dager' eller '4 dager' eller 'Hver hverdag' eller '1 dag' ved spørsmål 15 (ja) i På HVERDAGER (mandag til fredag), hvor ofte drikker du brus MED sukker (f.eks Cola, Solo)?)

Velg kun en av følgende:

- 1 glass
- 2 glass
- 3 glass
- 4 glass eller mer

Nå kommer noen spørsmål om hva du drikker i HELGEN

I HELGEN, hvor mye drikker du vanligvis av...

Legg sammen det du drikker lørdag og søndag.

(1/2 liter = 3 glass)

Venligst ve g passende svar til hvert alternativ:

	Aldri/sjeldent	1 glass	2 glass	3 glass	4 glass	5 glass	6 glass	7 glass eller mer
..brus MED sukker (f.eks. Cola, Solo)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..saft MFD sukker (f.eks. husholdningssaft, apelsin saft)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..ren juice?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Noen påstander om frukt, grønnsaker, snacks og drikke

Hvor enig eller uenig er du i følgende påstander?

Hjemme hos oss...

Vennligst velg passende svar til hvert alternativ:

	Helt enig	Litt enig	Verken enig eller uenig	Litt uenig	Helt uenig
..kan jeg spise grønnsaker når jeg vil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..kan jeg spise så mye grønnsaker jeg vil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hvor enig eller uenig er du i følgende påstander?

Hjemme hos oss...

Vennligst velg passende svar til hvert alternativ:

	Helt enig	Litt enig	Verken enig eller uenig	Litt uenig	Helt uenig
..har vi VANLIGVIS grønnsaker til middag hver dag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..varierer vi TYPE grønnsaker som serveres til middag i løpet av en uke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..varierer vi TILBEREDNINGEN av grønnsaker (rå, varm, etc.) som serveres til middag i løpet av en uke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..er det VANLIGVIS grønnsaker som jeg liker tilgjengelig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..deler moren og/eller laren min opp grønnsaker til meg som jeg kan spise mellom måltidene	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hvor enig eller uenig er du i følgende påstander?**Hjemme hos oss...**

Vennligst velg passende svar til hvert alternativ:

	Helt enig	Litt enig	Verken enig eller uenig	Litt uenig	Helt uenig
..er det VANLIGVIS frukt som jeg liker tilgjengelig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..varierer vi TYPE frukt som vi har i løpet av en uke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..daler moren og/eller faren min opp frukt til meg som jeg kan spise mellem måltidene	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..kan jeg spise frukt når jeg vil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..kan jeg spise så mye frukt jeg vil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hvor enig eller uenig er du i følgende påstander?

Vennligst velg passende svar til hvert alternativ

	Helt enig	Litt enig	Verken enig eller uenig	Litt uenig	Helt uenig
Moren min spiser frukt hver dag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Moren min spiser grønnsaker hver dag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Faren min spiser frukt hver dag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Faren min spiser grønnsaker hver dag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hvor enig eller uenig er du i følgende påstander?**Hjemme hos oss...**

Vennligst velg passende svar til hvert alternativ:

	Helt enig	Litt enig	Verken enig eller uenig	Litt uenig	Helt uenig	Har ikke brus med sukker hjemme
..har vi regler for når jeg kan drikke brus med sukker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..har vi regler for hvor mye brus med sukker jeg kan drikke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..kan jeg drikke brus med sukker når jeg vil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..kan jeg drikke så mye brus med sukker jeg vil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hvor enig eller uenig er du i følgende påstander?**Hjemme hos oss...**

Vennligst velg passende svar til hvert alternativ:

	Helt enig	Litt enig	Verken enig eller uenig	Litt uenig	Helt uenig	Har ikke brus med sukker hjemme
...er det VANLIGVIS brus med sukker tilgjengelig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...har vi VANLIGVIS brus med sukker til middager på HVERDAGER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...har vi VANLIGVIS brus med sukker til middager i HELGEN	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hvor ofte drikker dine foreldre/foresatte brus med sukker?

Velg kun en av følgende:

- Alltid
 Ofte
 Noen ganger
 Sjelden
 Aldri

Hvor enig er du i følgende utsagn på en skala fra 1- 5? Svaralternativ 1 tilsvarer "ikke i det hele tatt" og svaralternativ 5 tilsvarer "veldig". Kryss av for det svaralternativet som du mener passer best for din mor og din far.

Vennligst velg passende svar til hvert alternativ

	1 Ikke i det hele tatt	2	3	4	5 Veldig
Min MOR setter klare grenser for hvor mye sukkerholdig drikke (som brus, saft, etc.) jeg kan drikke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Min FAR setter klare grenser for hvor mye sukkerholdig drikke (som brus, saft, etc.) jeg kan drikke	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Min MOR setter klare grenser for hvor mye søtsaker (sjokolade, iskrem, kjeks, kaker, boller, etc.) jeg får spise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Min FAR setter klare grenser for hvor mye søtsaker (sjokolade, iskrem, kjeks, kaker, boller, etc.) jeg får spise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Min MOR setter klare grenser for hvor mye fettholdig snacks (potetgull, saltet peanøtter, etc.) jeg får spise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Min FAR setter klare grenser for hvor mye fettholdig snacks (potetgull, saltet peanøtter, etc.) jeg får spise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hvor enig eller uenig er du i følgende påstander?

Hjemme hos oss..

(Med "søt og fettholdig snacks" mener vi sjokolade, godteri, is, potetgull, salte peanøtter, søte kjeks, boller etc.)

Vennligst velg passende svar til hvert alternativ:

	Helt enig	Litt enig	Verken enig eller uenig	Litt uenig	Helt uenig
..er det vanligvis søt eller fettholdig snacks tilgjengelig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..har vi vanligvis søt eller fettholdig snacks servert som dessert eller snacks på HVERDAGER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..har vi vanligvis søt eller fettholdig snacks servert som dessert eller snacks på HELGEDAGER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..når vi har søt eller fettholdig snacks tilgjengelig, kan jeg spise når jeg vil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hvor ofte spiser dine foreldre søt og fettholdig snacks?

Velg kun en av følgende:

- Alltid
- Ofte
- Noen ganger
- Sjelden
- Aldri

Hvor enig eller uenig er du i disse utsagnene?

Når jeg selv kan velge hva jeg vil spise...

Vennligst velg passende svar til hvert alternativ

	Helst enig	Litt enig	Verken enig eller uenig	Litt uenig	Helt uenig
..synes jeg det er vanskelig å velge mat med lav fettinnhold (f.eks. frukt i stedet for potetgull eller lettmeik i stede for helmeik)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..synes jeg det er enkelt å velge et sunt mellommåltid (f.eks. frukt eller lettoghurt)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..fror jeg at jeg vet hvordan jeg kan velge og lage sunn snacks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..synes jeg det er vanskelig å velge sunne måltider/snacks når jeg er sammen med venner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..synes jeg det er lett å spise minst 5 porsjoner frukt og grønnsaker hver dag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
..synes jeg det er lett å spise passende måltidsporsjoner (ikke spise til jeg føler meg for mett)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix 2

Fact-sheet and e-mail to school principals

Miljømessige determinanter for helseatferd blant ungdom: ESSENS-studien



Overordnet mål

Det overordnede målet for ESSENS-studien er å bidra til ny kunnskap om faktorer som påvirker kostholdsvaner (inntak av frukt, grønnsaker, sukkerholdig drikke og usunn snacks), fysisk aktivitet og stillesittende atferd blant ungdom. Kunnskapen vil bli brukt for å planlegge og iverksette tiltak for å fremme mestring, trivsel og helse blant ungdommer på Øvre Romerike.

Bakgrunn

Kostholdsvaner, fysisk aktivitet og stillesitting er atferdsfaktorer som det er viktig å fokusere på for å fremme helse og trivsel blant ungdom. Inntak av frukt og grønt blant ungdom er generelt lavere enn anbefalt, mens inntak av tilsatt sukker er ofte høyere. Det fysiske aktivitetsnivået er lavt blant mange barn og unge, mens mye tid blir brukt på stillesittende aktiviteter. Ofte ser man en sosioøkonomisk gradient knyttet til flere av disse atferdene. Dette innebærer at ungdom fra familier med lavere sosioøkonomisk status generelt har en mer ugunstig atferd enn ungdom fra familier med en høyere sosioøkonomisk status.

Mål med prosjektet

- Å beskrive mønstre knyttet til enkelte kostholdsvaner, fysisk aktivitet og stillesittende atferd blant 8. klassinger på Øvre Romerike
- Å identifisere miljømessige forklaringsfaktorer for disse atferdene, med fokus på ungdommens egne oppfatninger rundt dette
- Å utforske sosioøkonomiske gradienter i disse atferdene
- Vurdere faktorer som forklarer disse sosioøkonomiske ulikhetene
- Å utforske elevenes og skoleadministrasjonens syn på muligheter og barrierer for å fremme sunne kostholdsvaner og fysisk aktivitet på skolen
- Å kartlegge miljøet rundt mat og fysisk aktivitet på og omkring skolen

Metodologi og datainnsamling

Det er planlagt en stor tverrsnittstudie som inkluderer alle 8. klassinger ved de ti ungdomsskolene på Øvre Romerike. Datainnsamlingen vil bli gjort ved hjelp av et elektronisk spørreskjema som vil ta om lag 30 minutter å besvare.

Det vil også bli gjennomført to kvalitative undersøkelser, hvor den første vil intervju skole-administrasjonen mens den andre vil intervju utvalgte elever i 9. klasse. Det vil også bli gjort en kartlegging av det fysiske miljøet rundt mat og fysisk aktivitet på og omkring skolen.

Prosjektgruppe

Prosjektet er et samarbeid mellom Romeriksløftet, som er et prosjekt i regi av kommunene på Øvre Romerike, og Institutt for sykepleie og helsefremmende arbeid ved Høgskolen i Oslo og Akershus. Flere delprosjekter inkludert et postdoktor-prosjekt og tre masteroppgaver, inngår også i prosjektet.

For mer informasjon, kontakt Mekdes Gebremariam (Mekdes-Kebede.Gebremariam@hioa.no) /tlf nr: 99852694

Kjære xxx,

I løpet av denne uken vil du bli kontaktet av forskere fra Høgskolen i Oslo og Akershus (HiOA) i forbindelse med en studie de ønsker å gjennomføre. Studien heter ESSENS og er et samarbeidsprosjekt mellom HiOA og Folkehelseforum Øvre Romerike (FØR). Studien har som mål å beskrive utvalgte aspekter ved ungdommenes kostholdsvaner, fysisk aktivitet og stillesittende atferd, samt å utforske hvilke faktorer som påvirker disse atferdsmønstrene. Vedlagt er et informasjonsark som beskriver studien mer i detalj. Din skole vil sammen med alle ungdomsskolene/barne- og ungdomsskolene på Øvre Romerike bli invitert til å delta i denne studien. Dersom du samtykker til at din skole skal delta, vil alle 8. klassinger på din skole bli invitert til å delta i en elektronisk spørreundersøkelse, som tar omtrent én skoletime å gjennomføre. I tillegg vil også noen elever i 9. klasse bli invitert til å delta i gruppediskusjoner mens noen ansatte (representanter fra skoleledelsen og 2-3 lærere) vil bli invitert til kvalitative intervjuer. Mer detaljert informasjon om rekruttering og datainnsamling vil du få av forskerne.

Dette er en viktig studie hvor resultatene vil bidra til fremtidige helsefremmende aktiviteter i vår kommune. Jeg anbefaler derfor på det sterkeste at du takker ja til å delta i denne studien.

Med vennlig hilsen

xxx

Appendix 3

Informed consent form to school principals



Til Rektor

Fakultet for helsefag
Institutt for sykepleie og helsefremmende arbeid

Besøksadresse
Kunnskapsveien 55
Kjeller

Telefon: 99852694
E-mail: Mekdes-Kebede.Gebremariam@hioa.no

Forespørsel om deltakelse i ESSENS studien

Usunne spisevaner, mangel på fysisk aktivitet og overdreven stillesittende atferd er viktige utfordringer blant ungdom, både i Norge og globalt. Levevaner en tilegner seg som barn og ungdom har en tendens til å vedvare, og skoleelever er derfor en viktig gruppe for forebyggende og helsefremmende tiltak.

ESSENS studien (Miljømessige determinanter for helsevaner blant ungdom) er et samarbeidsprosjekt mellom Høgskolen i Oslo og Akershus og folkehelseprosjektet Folkehelseforum Øvre Romerike (FØR). Hovedmålet er å identifisere faktorer som påvirker kostvaner, fysisk aktivitet og stillesittende atferd hos ungdom. Resultatene fra studien vil gi verdifull informasjon som kan brukes til å utvikle intervensjoner som fremmer sunne kostvaner og fysisk aktivitet, samt reduserer stillesitting blant ungdom. Vi inviterer herved din skole til å delta i studien.

Vedlagt er et informasjonsbrev med utfyllende informasjon om studien og deltakelse.

Prosjektets innhold er i tråd med Folkehelseforum Øvre Romerike (FØR) og målene i de nasjonale handlingsplanene for fysisk aktivitet og kosthold.

Vi ber dere vennligst gi tilbakemelding om dere ønsker å delta innen en uke etter dette brevet er mottatt. Bruk det vedlagte samtykkeskjemaet, som vil bli hentet av oss.

Vennligst oppgi kontaktinformasjon til kontaktlærere på 8. trinn ved å fylle ut listen nederst i dette brevet. Vennligst send navneliste over alle elever i 8. klasse, samt e-post adresse til deres foresatte til e-postadresse: Mekdes-Kebede.Gebremariam@hioa.no.

Vi håper på positivt svar, og ser frem til å høre fra dere.

Med vennlig hilsen

Liv Elin Torheim

Mekdes Gebremariam

Informasjon om ESSENS studien

Kostholdsvaner, fysisk aktivitet og stillesittende atferd er viktig for ungdoms fysiske, mentale og sosiale velvære. Likevel er inntaket av frukt og grønnsaker blant norsk ungdom lavere enn anbefalt, mens inntaket av tilsatt sukker er høyt. I tillegg er nivået av fysisk aktivitet lavt, i motsetning til nivået av stillesittende atferd som er høyt. Det viser seg også at ungdom fra lavere sosioøkonomisk bakgrunn har mest ugunstige helsevaner. For å kunne sette fokus på dette mønstret av helsevaner, er det viktig å vite hvilke faktorer som påvirker disse vanene i størst grad. Hovedmålet med ESSENS studien er derfor å kartlegge viktige faktorer som påvirker kostholdsvaner, fysisk aktivitet og stillesittende atferd blant ungdom. Studien vil også utforske faktorer som forklarer forskjeller i vaner blant ulike sosioøkonomiske grupper.

Studien vil ha flere understudier, som inkluderer et postdoktor prosjekt og fire masteroppgaver.

Vi ønsker å inkludere alle ungdomsskoler i Øvre Romerike og deres 8. klassinger. Datainnsamlingen vil gjøres ved hjelp av et elektronisk spørreskjema som vil bli gjennomført på skolen. I tillegg ønsker vi å gjennomføre kvalitative intervjuer med en-to ansatte i administrasjonen på hver skole og to-tre elever per 9 klasse.

Hva innebærer deltakelse i studien?

Alle skoler som velger å delta forplikter seg til å avsette ca. en skoletime for at elevene får svare på et spørreskjema, som tar omtrent 30 til 45 minutter å fullføre. Spørreskjemaet består av spørsmål om kostholdsvaner, fysisk aktivitet og stillesittende atferd, i tillegg til faktorer som kan påvirke disse vanene. Forespørsel om deltakelse vil sendes til foreldre/foresatte og elever før undersøkelsen skal gjennomføres. Studentene vil ha ansvar for at informasjon og samtykkeskjema gis til foreldre/foresatte. Vi planlegger å gjennomføre den elektroniske undersøkelsen i desember 2015. Forskningsassistenter vil være til stede når elevene fyller ut spørreskjemaet for å hjelpe til med tekniske problemer og svare på eventuelle spørsmål.

For den kvalitative undersøkelsen vil noen få ansatte fra skoleadministrasjonen, lærere og elever (9. klasse) fra enkelte av skolene bli spurt om å delta. Etter avtalt deltakelse vil det gjennomføres fokusgrupper med ca. en times varighet. Tidspunkt for fokusgruppene vil

tilpasses deltakerens tid og mulighet. Det vil også gjennomføres observasjon av skolemiljøet rundt mat og fysisk aktivitet.

All innsamlet data fra denne studien vil bli behandlet konfidensielt. Det er kun autorisert personell knyttet til prosjektet som har adgang til person identifiserbare data. De innsamlende data vil bli anonymisert innen Mars 2016. Informasjonsbrevene til foreldre/foresatte og elever vil gi opplysninger om at det er frivillig å delta, og at man når som helst kan trekke seg fra studien uten å oppgi noen grunn.

Norsk samfunnsvitenskapelig datatjeneste AS har blitt varslet om studien, og prosjektet har fått økonomisk støtte fra Høgskolen i Oslo og Akershus.

Vennligst kontakt en av våre prosjektmedarbeidere dersom du har spørsmål eller ønsker mer informasjon om studien.

Med vennlig hilsen,

Liv Elin Torheim (Liv.Elin.Torheim@hioa.no/ tlf. nr.: 47334643

Mekdes Gebremariam (Mekdes-Kebede.Gebremariam@hioa.no) / tlf. nr.: 99852694

Samtykkeskjema for deltakelse

Jeg har fått informasjon om prosjektet og gir samtykke i at skole skal delta i ESSENS studien.

(Signert av rektor, dato)

Vennligst oppgi kontaktinformasjon til kontaktlærer/e i 8.klasse:

1. Navn:
E-post adresse:
Telefonnummer:
2. Navn:
E-post adresse:
Telefonnummer:
3. Navn:
E-post adresse:
Telefonnummer:
4. Navn:
E-post adresse:
Telefonnummer:

Appendix 4

Information letter to students



Til elev

Fakultet for helsefag
Institutt for sykepleie og helsefremmende arbeid

Besøksadresse
Kunnskapsveien 55
Kjeller

Telefon: 99852694
E-mail: Mekdes-Kebede.Gebremariam@hioa.no

ESSENS: Miljømessige determinanter for helsevaner blant ungdom

ESSENS prosjektet gjennomføres av Høgskolen i Oslo og Akershus i samarbeid med folkehelseprosjektet Folkehelseforum Øvre Romerike (FØR). Prosjektet handler om kostholdsvaner, fysisk aktivitet, stillesittende atferd og faktorer som påvirker disse vanene. Din skole har valgt å delta i prosjektet.

Datainnsamlingen vil skje i november/desember 2015. Du vil fylle ut et elektronisk spørreskjema som tar omtrent 30-45 minutter. Spørsmålene handler om kostholdsvaner (sukkerholdig drikke, frukt, grønnsaker og usunn snacks), fysisk aktivitet og stillesittende atferd, i tillegg til faktorer som påvirker disse helsevanene. Det vil også være noen spørsmål om dine foreldre/foresatte og familie. Svarene du gir er anonyme og ingen andre kan se hva du har svart.

For at du kan delta i denne spørreundersøkelsen må dine foreldre eller foresatte skrive under på et samtykkeskjema. Du vil få dette skjemaet av læreren din. Det er frivillig å delta i studien, og du kan trekke deg når som helst uten å oppgi noen grunn. Hvis du velger å ikke delta i studien vil det ikke påvirke ditt forhold med skolen på noen måte. Det er kun personell knyttet til prosjektet som har adgang til personidentifiserbare data. Informasjonen som samles inn vil bli anonymisert innen mars 2016.

Studien vil bidra til viktig informasjon for å forbedre kostholdsvaner og fysisk aktivitet blant ungdom. Vi håper du vil delta i prosjektet!

Med vennlig hilsen,

Liv Elin Torheim

Mekdes Gebremariam

Appendix 5

Informed consent form to parents (including items on parental educational level)



Til foresatte

Fakultet for helsefag
Institutt for sykepleie og helsefremmende arbeid

Besøksadresse
Kunnskapsveien 55
Kjeller

Oslo, november 2015

Telefon: 99852694
E-mail: Mekdes-Kebede.Gebremariam@hioa.no

Informasjon til foresatte

ESSENS – Miljømessige determinanter for helsevaner blant ungdom

Skolen ditt barn går på har samtykket i å delta i prosjektet "ESSENS - Miljømessige determinanter for helsevaner blant ungdom". Prosjektets mål er å identifisere viktige faktorer som påvirker helsevaner blant ungdom. Det er et samarbeidsprosjekt mellom Høgskolen i Oslo og Akershus og folkehelseprosjektet Folkehelseforum Øvre Romerike (FØR). Vi ønsker å gi deg informasjon om prosjektet og be om tillatelse for at ditt barn kan delta.

Forskning viser at kostholdsvaner, fysisk aktivitet og stillesittende atferd er viktig for ungdoms fysiske, mentale og sosiale velvære. Levevaner en tilegner seg som barn og ungdom har en tendens til å vedvare, og skoleelever er derfor en viktig gruppe for forebyggende og helsefremmende tiltak.

Alle ungdomskoler i Øvre Romerike har fått invitasjon til å delta i dette prosjektet. Elever som deltar i prosjektet vil fylle ut et elektronisk spørreskjema på skolen, som tar omtrent 30-45 minutter å fullføre. Datainnsamlingen planlegges å bli gjennomført i november/desember 2015. Det elektroniske spørreskjemaet vil inneholde spørsmål om sukkerholdig drikke, frukt, grønnsaker, snacks, fysisk aktivitet, kostholdsvaner og faktorer som påvirker disse vanene.

Det er frivillig å delta i denne studien, og det er når som helst mulig å trekke seg fra studien uten å oppgi noen grunn. Spørreundersøkelsen vil gjennomføres på skolen, og forskningsassistenter vil være til stede for å bidra med assistanse og svare på eventuelle spørsmål.

SAMTYKKEERKLÆRING FOR ESSENS-PROSJEKTET

Jeg/vi har mottatt og lest informasjonen om datainnsamlingene. Deltakelsen er frivillig og mitt/vårt barn kan til enhver tid trekke seg uten å måtte oppgi noen grunn. Det er en forutsetning for deltakelsen at all informasjon som gis behandles strengt konfidensielt. Hvis mitt/vårt barn trekker seg fra undersøkelsen kan vi kreve at alle persondata blir slettet.

Jeg/vi samtykker i at mitt/vårt barn **KAN DELTA**:

Elevens navn (blokkbokstaver)		
Skole	Klasse	
Sted	Dato	Underskrift foresatt(e)

Vi ber om svar på de følgende spørsmålene, da det erfaringsmessig er vanskelig for elevene å svare på spørsmål om foresattes utdanningsnivå.

Foresatte 1:

1a. *Hvilken relasjon har denne foresatte til barnet som blir med i undersøkelsen?*

- Moren til barnet
- Faren til barnet
- Stemoren til barnet
- Stefaren til barnet
- Barnets kvinnelige foresatte
- Barnets mannlige foresatte

1b.

Hva er denne foresattes høyeste fullførte utdanning?

- Mindre enn 7 års utdanning
- Folkeskole/grunnskole/ungdomsskole (7-9 år)
- Gymnas/yrkesskole e.l. (inntil 12 år)
- Universitet-/høyskoleutdanning (inntil 4 år)
- Universitet-/høyskoleutdanning (mer enn 4 år)

Foresatte 2:

2a. *Hvilken relasjon har denne foresatte til barnet som blir med i undersøkelsen?*

- Moren til barnet
- Faren til barnet
- Stemoren til barnet
- Stefaren til barnet
- Barnets kvinnelige foresatte
- Barnets mannlige foresatte

2b.

Hva er denne foresattes høyeste fullførte utdanning?

- Mindre enn 7 års utdanning
- Folkeskole/grunnskole/ungdomsskole (7-9 år)
- Gymnas/yrkesskole e.l. (inntil 12 år)
- Universitet-/høyskoleutdanning (inntil 4 år)
- Universitet-/høyskoleutdanning (mer enn 4 år)

Samtykkeerklæringen returneres snarest til kontaktlærer via eleven i konvoluttet brevet kom i.

Appendix 6

Ethical approval from Norwegian social science data services



Mekdes Gebremariam

Institutt for helse, ernæring og ledelse Høgskolen i Oslo og Akershus

Postboks 4, St. Olavs plass

0130 OSLO

Vår dato: 23.09.2015

Vår ref: 44365 / 3 / AGL

Deres dato:

Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 26.08.2015. All nødvendig informasjon om prosjektet forelå i sin helhet 22.09.2015. Meldingen gjelder prosjektet:

44365 *Environmental determinants of health behaviors among adolescents: the ESSENS study*
Behandlingsansvarlig Høgskolen i Oslo og Akershus, ved institusjonens øverste leder
Daglig ansvarlig Mekdes Gebremariam

Personvernombudet har vurdert prosjektet, og finner at behandlingen av personopplysninger vil være regulert av § 7-27 i personopplysningsforskriften. Personvernombudet tilrår at prosjektet gjennomføres.

Personvernombudets tilråding forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, ombudets kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, <http://www.nsd.uib.no/personvern/meldeplikt/skjema.html>. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, <http://pvo.nsd.no/prosjekt>.

Personvernombudet vil ved prosjektets avslutning, 31.03.2016, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Katrine Utaaker Segadal

Audun Løvlie

Kontaktperson: Audun Løvlie tlf: 55 58 23 07

Vedlegg: Prosjektvurdering

Dokumentet er elektronisk produsert og godkjent ved NSD's rutiner for elektronisk godkjenning.

Aktiveringstilknytning: 02/01/2015

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