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Master thesis

Mass sport events as a motivational drive to improve health

Masse idrettsarrangementer som en motiverende drivkraft for å fremme helse

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Abbreviations and acronyms

La^-	Lactate
mm Hg	Millimetres of Mercury
MSE	Mass sport event
PA	Physical activity
REMM	Recreational Exercise Motivation Measure
SDT	Self-determination theory
$\dot{V}o_{2\,max}$	Maximal oxygen uptake
WHR	Waist-hip ratio

Abstract

Mass sport events (MSE) are found to be popular worldwide, and research indicates MSE might have health benefits, and these events present a potential to encourage people to trail physical activity. However, there is a limited amount of research that has explored MSE potential to encourage the level of physical activity and exercise, and especially with a focus on motivational factors. With the high level of inactivity and sedentary in Norway today it is a need to search for arenas that promote physical activity and exercise. The main aim of this study was to present research investigating the potential motivational drive among first time participants in MSE, and MSE potential to improve health. This project focused on motivation and health indicators, and the sample consisted of first time MSE participants in Birkebeinerrennet 2015. The research questions in this project was "*To what extend can entering a mass sport event for the first time provide a motivational drive for more regular exercise, and can this lead to improved health?*" and "*To what extent can mass sport events involve individuals with a low level of physical activity?"*

To understand the potential in MSE a quantitative approach was used, collecting a wide variety of data. Data were collected using questionnaires and repeated physical fitness measurements. The health-indicators was measured 14-weeks before the event, and 1-week before the event.

This project identified, among other, mastery, physical fitness, enjoyment, exercise goal, and personal challenge as the most important motivational factors for exercise and participating in MSE. It was also found a statistic significant change in the health-indicators $\dot{V}O_{2\ max}$ and body fat from the 14-weeks before the event test to the 1-week before the event test. It is suggested that this MSE do not involve individuals with a low level of physical activity as the sample in this project presents high scores in the health-indicators, indicating the participants are at a high level of physical activity and exercise in the 14-weeks before the event test. The study concluded that MSE has the potential to provide a motivational drive for regular exercise, which can lead to improved health. However, this MSE is not found to involve individuals with a low level of physical activity.

Norsk sammendrag

Masse idrettsarrangementer er funnet å være populær over hele verden, og forskning viser at disse kan ha helsemessige fordeler, og et potensial til å oppmuntre folk til oppta fysisk aktivitet. Det er en begrenset andel forskning som har undersøkt masse idrettsarrangementenes potensial til å fremme fysisk aktivitet og trening, og spesielt med fokus på motivasjonsfaktorer. Med det høye nivået av inaktivitet og stillesitting i Norge i dag er det et behov for å utforske arenaer som fremmer fysisk aktivitet og trening, og da blant annet potensialet i å bruke større idrettsarrangement for å fremme fysisk aktivitet og trening. Hovedmålet med denne studien var å presentere potensialet som masse idrettsarrangement har som en motiverende arena for førstegangsdeltakere til å oppta trening, og masse idrettsarrangements potensiale som en helsefremmende arena. Dette prosjektet fokuserte på motivasjon og helseindikatorer, og utvalget var førstegangs deltakere i Birkebeinerrennet 2015. Problemstillingene i dette prosjektet var "I hvilken grad kan deltagelse i et masse idrettsarrangement for første gang gi en motiverende drivkraft for mer regelmessig trening, og kan dette føre til bedre helse?» og «I hvilken grad kan et masse idrettsarrangement involvere personer med et lavt nivå av fysisk aktivitet?"

For å være i stand til å forstå potensialet i å bruke masse idrettsarrangement ble en kvantitativ metode anvendt, og det ble samlet inn en rekke data. Data ble samlet inn ved hjelp av spørreskjemaer og gjentatte fysiske fitness målinger. Helseindikatorene ble målt 14 uker før arrangementet, og 1 uke før arrangementet.

Dette prosjektet har identifisert blant annet mestring, fysisk form, glede, treningsmål, og personlig utfordring som de viktigste motivasjonsfaktorene for trening og deltakelse i masse idrettsarrangement. Det ble også funnet en statistisk signifikant endring i helse-indikatorene $\dot{V}o_2$ maks og kroppsfett fra testene 14-uker før arrangementet til testene 1 uke før arrangementet. Videre viser utvalget i dette prosjektet et høyt nivå av fysisk aktivitet og trening i testene gjennomført 14 uker før arrangementet basert på helseindikatorer, som indikerer at større idrettsarrangement ikke involverer personer med et lavt nivå av fysisk aktivitet. Studien konkluderte med at større idrettsarrangement har potensial til å gi en motiverende drivkraft for regelmessig trening, noe som kan føre til bedre helse. Allikevel er ikke dette spesifikke masse idrettsarrangementet funnet å involvere personer med et lavt nivå av fysisk aktivitet.

1. Introduction

This thesis reports as the final project in the master´s degree in the Faculty of Public Health Science, in Hedmark University College. The project focuses on participation in mass sport events (MSE) and MSE as a potential health-promoting arena. MSE and physical activity events is described by Murphy and Bauman (2007) as events that can vary from large scale, on-off sporting events, to participatory "mass events" such as city road races. This project is based on the interest for sport participating as a motivational drive for regular exercise that can lead to enhanced health.

The following chapter introduces the theme MSE as a promoter for regular exercise, and MSE as a health-promoting arena. This will be presented with a focus on motivation as Whitehead (1993) indicates the answer to people's lack of physical activity is found largely in the realm of psychology, and specifically in the area of motivation. Furthermore, the specific MSE examined in this project, Birkebeinerrennet, is presented. The purpose of this project and the research questions will also be presented in this chapter.

Several important terms are frequently used in this thesis. The World Health Organization (WHO), Caspersen, Powell, and Christenson, and the dictionary present the definitions used in this project on the terms health, PA, exercise and sport. The World Health Organization define health as a "state of complete physical, mental, and social wellbeing, not merely the absence of disease or infirmity" (World Health Organization, 1946).
PA is defined "as any bodily movement produced by skeletal muscles that results in energy expenditure" (Caspersen, Powell, & Christenson, 1985, p. 126). In addition Caspersen et al. (1985) write that PA is positively correlated with physical fitness, and energy expenditure (kilocalories) varies from low to high. PA in daily life can be categorized as sports or other activities. Exercise is a subset of PA that is planed, structured, repetitive, and purposive in the sense that improvement of maintenance one or more components of physical fitness is an objective. Moreover exercise is very positively correlated with physical fitness (Caspersen et al., 1985).

Sport is defined as an "activity involving physical exertion and skill in which an individual or team competes against another or others for entertainment" (ordnett.no, n.d-d)

1.2 Background to the project

Mass sport events are becoming increasingly popular worldwide, and Lane, Murphy, Smith, and Bauman (2010, p. 5) emphasis that "…these events may have health benefits as they foster low intensity participation in a non competitive, fun environment". Lane et al. (2010) also emphasis that MSE are events with a potential to encourage people to trail physical activity since they reach out to a wide, and varied population. The Public Health report 2014, by the Norwegian Institute of Public Health emphasis physical inactivity, and sedentary as one of the major public health challenges, in Norway today (Stoltenberg, 2015). Insufficient physical activity is one of the leading risk factors for cancer, and cardiovascular diseases, along with unhealthy diet, smoking, and damaging alcohol consumption. This cause two out of three lost years of life in Norway (Stoltenberg, 2015). Folkehelseinstituttet (2011) indicates that adults are in average nine hours sedentary each day. Sedentary work, driving, and less demanding housework has reduced the physical activity level, and those in their 30-s are the least active. Research indicates that only 30 % of the adult, Norwegian population is physically active according to the recommendations of 150 minutes of moderate-intensity PA or 75 minutes of vigorous-intensity PA each week (Stoltenberg, 2015). Physical activity is an important instrument by means of preventing, and treating more than 30 different diagnoses, and conditions including type 2 diabetes, cardiovascular diseases, musculoskeletal diseases, and some forms of cancer (Stoltenberg, 2015).

Whitehead (1993) indicates that the answer to people's lack of physical activity is found largely in the realm of psychology, and specifically in the area of motivation. Furthermore, in the specific area of MSE, Rogers (2000) emphasise that motivation to participate in recreational sports, and exercise is a critical area to investigate, and render the possibility to increase the level of physical activity in the general community.

The Norwegian Government emphasises the importance of including, and using, a vide range of arenas in following up public health goals. The employers, and the participants within sport, outdoor life, and other voluntary organizations have been invited to be jointly responsible in following up public health goals (Caspersen et al., 1985; Folkehelseinstituttet, 2012; Helsedirektoratet, 2011a). To emphasis the potential in using MSE, the population reach in MSE will be presented. Some examples on running MSE, with a large population reach, are TCS New York City Marathon. That event had a total of 50.530 finishers in 2014

(TCS New York City Marathon, n.d.). BMW Berlin Marathon had a total of 56.061 participating in their different events in 2014 (BMW Berlin Marathon, n.d.). Vasaloppet; a large mass sport ski event in Sweden had 15 800 participants signed up for the race in February 2015, and for the race taking part in 2016 15 800 participants has signed up already (Vasaloppet.se, 2015). The other races organized by Vasaloppet in the Vasaloppet Week, has equal public appeal (Rosenborg, 2013).

1.2.1 The mass sport event Birkebeinerrennet

The specific MSE examined in this project is Birkebeinerrennet. Birkebeinerrennet is a skiing MSE taking place in Norway, and was arranged for the 77th time the 21st of March 2015. The race covers a distance of 54 kilometres (Birken, n.d.-b).

The first Birkebeinerrennet was arranged in 1932 with a total of 155 men at start. The race has been completed each year except in the war years 1940-1945. In 1948 it was cancelled due to a disagreement about whether the event should be hold as an elite-event, or as a MSE. In addition the race was cancelled in 2007, and in 2014 because of difficult weather conditions (Birken, n.d.-a). Birkebeinerrennet is based on a historic event that took place in Norway in the 13th century, with Håkon Haakonsøn as the son of the departed king, in focus. It was civil war in Norway at that time, and Håkon Haakonssøn, who has only a little boy, was aimed for. "Birkebeinerne" protected him, and escaped with the little child. From Lillehammer to Rena the two best skiers among "Birkebeinerne" went ahead with the little boy, in a snowy and windy weather. The skiers reached Østerdalen, and Håkon Haakonsøn was later king of Norway. Håkon Haakonsøn is now each year represented as each participants in Birkebeinerrennet carries a backpack of at least 3,5 kg (Birken, n.d.-d).

In Birkebeienrrennet 21st of March 2015 a total of 12 877 signed up for the race, and a total of 10 542 finished. For the other skiing events organized in addition to "Birkebeinerrennet" in 2015 a total of 21 801 were signed up, and a total of 19 197 participated in the different events (Birken, n.d.-c).

2.1.2 Birkens events

The organizer of the MSE investigated in this project, Birken, has also several other events each year in addition to Birkebeinerrennet. Birken organize events in three different seasons, the running event Birkebeinerløpet and other running events in the spring, and Birkebeinerrittet and other biking events in the autumn. This expose the variation of events offered to the participants.

2.2 The purpose of the project

The purpose of this project was to further examine the idea that MSE might be an arena that influence exercise behaviour of the population world wide, and the potential MSE has to encourage people to trail physical activity (Murphy & Bauman, 2007). The aim in this project was to investigate to what extend entering a MSE for the first time could provide a motivational drive for more regular exercise, and importantly, if this could lead to improved health. Motivational factors were central when investigating MSE, and the motivational characteristics among MSE participants. This project examines both health-indicators, and motivation, and may therefor give a further explanation on the potential of using MSE as a health-promoting arena.

2.3 Research questions

The foundation for the research in this project is based on the two research questions

1. To what extend can entering a mass sport event for the first time provide a motivational drive for more regular exercise, and can this lead to improved health?

2. To what extent can mass sport events involve individuals with a low level of physical activity?

The first research question was developed to investigate the potential MSE presents in promoting regular exercise habits. Both regarding the motivational drive among first time MSE participants, and linking this to more regular exercise habits. The second research question was developed in order to investigate the potential population reach using MSE, and investigating the possibility to encourage individuals with a low level of PA.

3. Literature review

Being familiar with literature and research on the topic of interest is important. This allows the researcher to build on what is already known about the phenomenon of interest. This is also important to avoid covering the same ground as others (Bryman, 2008). This chapter will present literature on MSE as potential health promoting arena, motivational factors for PA, exercise and sport, health among MSE participants, and literature presenting the population group participating in MSE.

It was searched for relevant literature on who the participants in MSE are, the health among MSE participants, and literature regarding the health benefit from participating in a MSE. In addition motivational factors for participating in MSE was searched for, also motivational factors for taking part in exercise and sport. In the search for literature the databases "Oria" "EBSCOhost " and "Google scholar" was used. The search keywords were: mass sport competition, mass spot event, mass sporting event, health effect, health indicators, participations in sport, self-determination theory, motivation among sport participants, Recreational Exercise Motivation Measure. The authors included regarding literature on MSE are Lane, A., Murphy, N., Bauman, A., Smith, P., Rissel, C., and Bowles, H. R. Literature regarding motivation towards exercise and sport mainly include the authors Kilpatrick, M., Herbert, E., Bartholomew, J., Aaltonen, S., Rottensteiner, M., Kaprio, J., and Kujala, U. M.

The literature included in the literature review was research articles, marked surveys, and government documents. Criteria's for inclusion of articles has been used; mainly peer-reviewed articles, research presented after 2000, and research from known and well-respected journals is mainly used. In addition, the reference list in some articles and books has been used to find relevant literature.

The following Webpages were also used in search for relevant literature www.regjeringen.no, www.helsedirektoratet.no, www.fhi.no.

3.1 Mass sport events as a potential health promoting arena

The review paper by Murphy and Bauman (2007) indicates that local MSE might impact the physical activity behaviour of the population. The categories reviewed in this study are elite sporting events, non-elite mass events with potential for community-wide participation, and major popular-level health promotion events. This study highlights the great public health potential with increased percentage of walkers in road races, which suggest that such events have the potential for mass community "reach". It is also argued that the health sector has generally failed to engage with the opportunities provided by MSE to market the physical activity message. In addition, the health impact of such events has not been evaluated. Murphy and Bauman (2007) suggest that local mass sport events appear to influence physical activity-related infrastructure. Events that emphasis physical activity can be used to encourage populations to adopt a more active lifestyle, and Murphy and Bauman (2007) emphasises that participating in MSE may be a novel approach to encourage inactive to begin an active lifestyle, but the public health applicability of this strategy has not been investigated thoroughly. Murphy and Bauman (2007) concludes that the evidence for public health benefits in major sporting is lacking, and that mass events might influence physical activity when the events is embedded in a broader strategic program.

Bowles, Rissel, and Bauman (2006) suggest that participation in mass PA events might be a novel approach for encouraging inactive to explore an active lifestyle. They reported cycling ability and numbers of times the participants rode a bicycle during the month before the event, and a follow-up one-month after the event. The total sample was 918. The respondents were categorized as "sufficiently active" if they participated in 150 minutes of total activity over five or more sessions in the previous week. If they did not meet these criteria they were categorised as "insufficiently active". The numbers of monthly bicycle rides increased significantly between both respondents with low pre-event self-rated cycling ability and among first-time participants in the mass cycling event. Bowles et al. (2006) presented the limitations to the application of these results as the reliance of self-reported physical activity, the lower response rate on the follow up (55 %) that raises the possibility that the respondents were the most positive ride participants. However, Bowles et al. (2006) emphasising this study is one of the first to examine the potential of a mass cycling event to promote adoption and maintenance of physical activity in previously insufficiently or irregularly individuals.

3.2 Motivation for exercise

When investigating motives for leisure-time physical activity Aaltonen, Rottensteiner, Kaprio, and Kujala (2014) found that among physically active the main motivation for PA was, related to mastery, physical fitness, the social aspect of PA, psychological state, enjoyment, willingness to be fitter/look better than other, and appearance. Others expectations was the one item on which the inactive persons scored higher than the active. Aaltonen et al. (2014) research consisted of 2308 participants, with a mean age of 33,9, and 53,4 % woman. The participants PA motivation were evaluated with an 8-item questionnaire modified from the Recreational Exercise Motivation Measure (REMM). Aaltonen et al. (2014) concludes that motivational factors differ between active and inactive persons, and intrinsic motives are associated with consistent leisure-time physical activity.

Research carried out by Kilpatrick, Hebert, and Bartholomew (2005) indicates that participants in sport were more likely to report intrinsic motivation, such as enjoyment and challenge than participants in exercise. Motivation for exercise was more extrinsic, focused on appearance, weight and stress management. This research was conducted at a university in the United States, with a sample of 233 students, 132 woman and 101 men. The participants completed two modified versions of the EMI-2 that composed of 51 items that comprise 14 subscales. Each of these subscales reflected different motivational reasons to engage in physical activity. The motives for sport participation were more likely to satisfy the participant's basic psychological needs of competence, autonomy and affiliation, and therefor, fostering self-determination to a greater extent than among the participating in general exercise. Findings by Kilpatrick et al. (2005, p. 87) indicate that "motives for sport participation are more desirable than those for exercise and may facilitate improved adherence to physical activity recommendations".

When examining motivation among participants in MSE Cloes, Emond, Ledent, and Piéron (2000) found that the main motivation was recreation. This study included 373 participants in the five different MSE, beach volleyball tournaments, an inter-cities sport festival, a 10 km jog, a 24 km karting race, and a mountain bike race. These were all MSE in Belgium. Presenting the motivational factors in each event recreation and interest in the events sport; or interest in sport in general were the main categories in the beach volleyball tournament,

karting race and the mountain bike ride. Interest in the specific sport was the category ranked first by the joggers.

To get knowledge about the typical Birkebeiner participants Birken (2010) carried out a research among the participants in 2010. The research presented the benefit it gave to the participant's health, and Birkebeinerrennet as an exercise goal as the two highest motivating factors for participation in Birkebeinerrennet. It is not known the sample size reporting in this research. The marked survey on Birkebeinerrennet 2013 by Bruland and Eide (2013) indicate similar results as Birken (2010); with the main motivating factor for participation being the exercise goal. The sample size in this marked survey is not known. Shilts, Horowitz, and Townsend (2004) review the effect of goal setting characteristics on behaviour change, and investigated the effectiveness of interventions containing goal setting. A literature search was conducted for the period January 1977 through December 2003. This review included 28 studies, which met the inclusion criteria's. Shilts et al. (2004) review demonstrate that goal setting has presented some promise in promoting physical activity changes among adults.

3.3 Health among mass sport event participants

In the events Birkebeienerrennet and Vasaloppet research demonstrate that elderly men who were participating in average live longer than the non-participating men. In Vasaloppet the similar results are found regarding women (Bjørnerud, 2010; Carlsson, Olsson, Farahmand, Hållmarker, & Ahlbom, 2007). Carlsson et al. (2007) discuss the reason why participants can expect to live longer. Their main hypothesis is that positive health outcome is a result of exercise over a longer period of time. Carlsson et al. (2007), also emphasis that the positive health outcome might be a result of other positive lifestyle habits as dietary habits and smoking habits.

It is argued that participants in sport or other activities have better health than the average population (Helse og omsorgsdepartement, 2013). It is not yet identified if this is related to heritage or the effect of exercise (Bjørnerud, 2010; Carlsson et al., 2007; Lamb, Brodie, Minten, & Roberts, 1991). Carlsson et al. (2007) research on participants in on of the MSE in Vasaloppet Week demonstrate that participants are more physical active, fewer are overweight, fewer are smoking, and they eat more fruits and vegetables compared to the

average population. This research included a total of 12.241 participants, 62 % of all participants in 2006. The research by Carlsson et al. (2007) also indicate that participant within sport also possessed better self-perceived health. Lamb et al. (1991) suggest that better health and longevity may come from participating in MSE, but it could also indicate that the part of the population that are ill or have a poor health may abstain from participating. This is supported by Carlsson et al. (2007).

3.4 Who are the participants in mass sport events?

In the study by Bowles et al. (2006) investigating a cycling event there were a large majority of men, with a total of 72 %. A large majority of the participants in Birkebeinerrennet also appears to be men. The marked surveys conducted on the participants in Birkebeinerrennet 2010, 2012 and 2013, respectively 73,9, 80 and 81 % of the participants were men (Birken, 2010; Bruland & Eide, 2012, 2013). In the marked survey among the participant in Birkebeinerrennet 2015 a total of 80 % were male (Bruland & Eide, 2015).

When investigating the social distribution among the participants in Birkebeinerrennet there is a large prevalence of participations with a higher education (Birken, 2010). The marked surveys conducted on the participants in Birkebeinerrennet 2010 a total of 77,2 % had a higher education, in 2012 75 % of the participants had a higher education, and in 2013 a total of 76 % of the participants had a higher education (Birken, 2010; Bruland & Eide, 2012, 2013). Among the participants in Birkebeinerrennet 2015 a total of 75 % of the participants had a higher education (Bruland & Eide, 2015)

In the investigation of working condition among participants in Birkebeinerrennet, most of the respondents in the marked survey conducted on Birkebeinerrennet 2010 reported that they were working full time, and a total of 80,8 % had a income above 400.00 NOK a year (Birken, 2010). When presenting the social distribution of the participants in Birkebeinerrennet they represent a group with a positive health, and the positive health benefits have the last 30 years been larger for the group with an already positive health, with a high education and a good income (Folkehelseinstituttet, 2005). Those with the longest education and best economy, have the greater health. Adults with higher education are fewer hours sedentary each day, and has a higher level of activity (Folkehelseinstituttet, 2008a).

3.5 The gaps in the research

Murphy and Bauman (2007) argue that MSE might impact the physical activity behaviour of the population, but the evidence is insufficient. Lane et al. (2010), also argue that research on long-term effect by MSE on PA is insufficient. Bowles et al. (2006) present the potential of in MSE to promote adoption and maintenance of physical activity in previously insufficiently or irregularly individuals, but emphasis this study is one of the first to examine this potential. The studies above describe the health of those already participating in MSE as Carlsson et al. (2007), and not whether entering this type of events present a motivational drive for more exercise, and if this can potential lead to improved health. As Carlsson et al. (2007) present there is also a remaining question regarding whether these benefit comes from participating in the particular event or if those participating already can be said to be healthier than the general population. Lane et al. (2010) also argue that it is not known whether people who take part in an event do so as a "once-off", or if this event may trigger a long term, sustained PA habit amongst the participants. Rogers (2000) highlights the need for further research regarding motivation in sport and exercise participants, and suggest the need for research to move away from participation patterns and socialisation towards an understanding of what motivates people to exercise and to examine the effectiveness of motivational interventions. Carlsson et al. (2007) suggest that the "less healthy" may abstain from participating, and the marked survey by Birken (2010) present those in a lower social gradient abstain from participating, but there is still a gap in this research regarding why they abstain from participating in MSE. As presented in the introduction, and emphasised by Stoltenberg (2015) physical inactivity, and sedentary is one of the major public health challenges in Norway today, and that emphasis the need to examine potential arenas that could present as a motivational drive for regular exercise.

4. Theoretical framework

This section of the thesis covers the theoretical framework of the research, and includes self-determination theory (SDT), and the Model of social determinist of health.

4.1 Participation motivation

Stability and maintenance of physical activity habits are easier to achieve when being intrinsic motivated (Hagger & Chatzisarantis, 2007), and might therefor be seen as an important factor in the research field within public health. Motivation concerns what moves people to act, think and develop. The focus of motivation research is therefore on the conditions and processes that facilitate persistence, performance, healthy development, and vitality in our human attempts (Deci & Ryan, 2008a). Motivation was an early topic of interest to sport psychologist when sport and exercise were discussed. In the course of time terms of both participation motivation and achievement motivation has been discussed. During the 1990´s there was a considerable interest in the study of participation motivation. Two of the most popular theoretical perspectives for research generation were self-efficacy and goal perspective theories. These theories significantly contributed to the understanding of sport motivation. However, their cognitive emphasis and their central focus on competence or efficacy limited their discussion of other important factors that might initiate motivated behaviours (Deci & Ryan, 2002). In contrast SDT provides a more comprehensive framework by considering issues of autonomy and relatedness, in addition to competence, when predicting sport and exercise participation (Deci & Ryan, 2002). Furthermore, SDT "is the only theory of motivation that explicitly identifies autonomy as a human need, when supported, facilitates more autonomous forms of behavioural regulation" (Ng et al., 2012, p. 325).

4.2 Self-determination theory

Deci and Ryan developed SDT in the 1980s, and introduced three primary, psychology needs that motivate human behaviour across domains (Buckworth, Dishman, O'Connor, & Tomporowski, 2013). These needs are autonomy, competence and relatedness (Deci & Ryan,

2002). Autonomy is defined as "the right to self-determination" (ordnett.no, n.d-b), competence as "the ability to do something successfully" (ordnett.no, n.d-a) and related as "belonging to the same family, group or type" (ordnett.no, n.d-c). SDT is a theory that provides a comprehensive framework by considering issues of autonomy, relatedness and competence in predicting sport and exercise participation, also the theory present how thesis are fulfilled or thwarted, and Deci and Ryan (2002) argue that these are the basis for individual differences in motivation.

SDT is a macrotheory of human motivation and addresses basic issues as personality development, self-regulation, universal psychology needs, life goals and aspirations, energy and vitality, the impact of social environments on motivation and the impact of social environments on motivation, affect, behaviour, and well being. SDT began by differentiating types of motivation. The idea was that the type and quality of a person's motivation would be more important than the total amount of motivation for predicting many important outcomes. These could be psychology health and well being, effective performance, creative problem solving, and deep or conceptual learning (Deci & Ryan, 2008b).

4.2.1 The continuum of self-determination

The most central distinction in SDT is between autonomous motivation and controlled motivation (Deci & Ryan, 2008b).

Autonomous motivation comprise both intrinsic and the types of extrinsic motivation as people have identified with an activity's value, and ideally intergraded it into their sense of self (Deci & Ryan, 2008b). Intrinsic motivation implies engaging in an activity for the pleasure and satisfaction inherent in the activity. When doing an activity because you enjoy it and find it interesting and satisfying you are said to be intrinsically motivated. A tripartite taxonomy of intrinsic motivation has been suggested (Deci & Ryan, 2002). First, intrinsic motivation implies knowledge about taking part in an activity because of the pleasure and satisfaction derived from learning, exploring, and understanding new things. Second, intrinsic motivation to accomplish things apply to engaging in activities because of the pleasure and satisfaction derived from trying to surpass oneself, creating, or accomplishing something. Third, intrinsic motivation to experience stimulation operates when one is participating in an activity because it is associated with stimulating sensations (Deci & Ryan, 2002).

Deci and Ryan (2002, p. 279) describe intrinsic motivation when individuals; "choicefulness in their behaviour, they fulfilling their need for autonomy. Additionally, they are at a lever of optimal challenge, which fulfils their competence needs. A state of intrinsic motivation as associated with feelings of satisfaction, enjoyment, competence, and the desire to persist at the activity."

The extrinsic motivation is to exercise for a reward or to avoid negative consequences separate from behaviour or because it leads to some separate consequences (Buckworth et al., 2013; Deci & Ryan, 2008a). Extrinsic motivation is in contrast to intrinsic motivation, that individuals are engagement in activities are not for reasons inherent in them but for instrumental reasons. Extrinsic motivation can be identified as four different types of motivation that vary in their degree of self-determination. The first type of extrinsic motivation is external regulation. "When someone is externally regulated, acts are performed to attain a positive end state (e.g., to get money) or to avoid a negative end state (e.g., to avoid a parent´s reprimands) which are separated from the activity itself" (Deci & Ryan, 2002, p. 42). This is how extrinsic motivation is typically being portrayed in the literature. The second type of extrinsic motivation is interjected regulation. This stage represents the first stage of the internalization process. In this stage the motivation is still not self-determined. The person acts out of obligation, in order to avoid feeling shame and internal pressure. The third type of extrinsic motivation is identified regulation. This is "when the reason to engage in an activity are internalized such that the activity is judged valuable by the person, he or she will perform the activity with a sense of choice and the behaviour is said to be regulated through identification with the activity" (Deci & Ryan, 2002, p. 43). A person who is acting out of identified reasons is said to be relatively self-determined. The fourth type of extrinsic motivation refers to integrated regulation. Integrated regulation is the most self-determined type of extrinsic motivation. This type of extrinsic motivation indicates that although identification implies choice, choices to engage in some activities are not necessarily coherent with other self-structures.

The SDT is often used in exercise and sport when examining motivation. However, the theory is also used to study outcomes of motivation for health-related behaviours (Ng et al., 2012). The SDT approach has been demonstrated to be a relevant theory in the field of

understanding goals and motives for recreational exercise (Teixeira, Carraça, Markland, Silva, & Ryan, 2012). On this basis the SDT is considered to provide the correct understanding of the participants motivational drive for exercise in this project.

4.2.2 Goal setting

Goal setting is regarded to be an effective strategy for supporting exercise behaviour change, and goal setting is found to be effective in increasing PA among adults (Shilts et al., 2004). This argues the use of goal setting as a motivational factor for participating in a MSE, in addition to the use of SDT as a theoretical framework. Smith and Bar-Eli (2007) supports Shilts et al. (2004) and emphasise that goal setting is one of the most powerful motivational techniques for enhancing performance and productivity. Furthermore they define goal as "the object, aim or endpoint of an action, or what an individual describes as an accomplishment being sought" (Smith & Bar-Eli, 2007, p. 306). For a goal to be realistic and achievable, a comprehensive psychological and physiological assessment is necessary. A psychological assessment provides valuable information about attitudes, beliefs, expectations, and part experiences that can either support or be barriers to goal achievement. To know the psychological barriers might help individuals to define goals that addresses the needs of the whole person in his or her social context (Buckworth et al., 2013).

Generally flexible, specific goals that are consistent with people's capabilities, values, resources and needs are more effective than general non-specific goals (Buckworth et al., 2013). Kyllo and Landers (1995) has identified several characteristics of goals that enhance exercise behaviour. They state that the goals has to be realistic, does not depend on someone else, specific, measurable, challenging, time frame, motivating, addresses physiological factors (e.g., health, fitness). Goal setting is generally effective in increasing physical activity, and is an effective strategy for supporting a change in exercise behaviour (Buckworth et al., 2013).

4.3 Model of social determinist of health

The literature review indicates the participants in MSE are often a male with high income and a high education. Do to these findings, and also the broader explanation given by the Model of social determinist of health by Dahlgren and Whitehead (1991) this model will be presented as a part of the theoretical framework in this project. Earle, Lloyd, Sidell, and Spurr (2007) emphasise that the key factors that influence health are biology and genetics, lifestyle and behaviour, living and working conditions, social and community networks, and the wider social conditions in which individuals are located. A social model of health locates both individual biology and personal behaviours within wider social contexts (Earle et al., 2007).

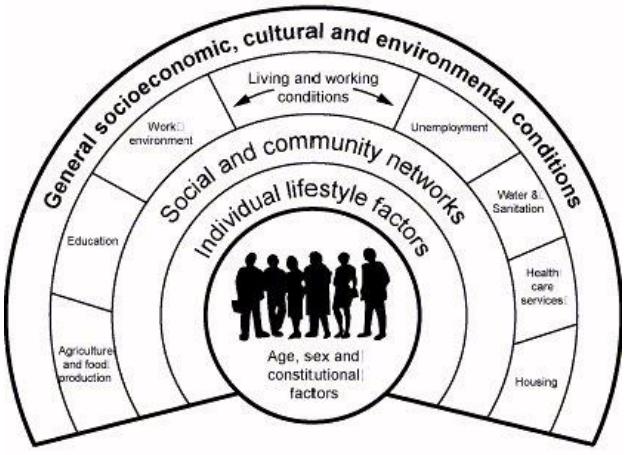

***Figure 1**: Model of Social Determinist of Health (Dahlgren & Whitehead, 1991)*

The model by Dahlgren and Whitehead (1991) offers a multifactorial illustration of the wider determinants of health. The models core are age, sex and constitutional factors. The inner layer is individual lifestyle factors, the second layer is social and community networks, the third layer is living and working conditions; housing, health care services, water and sanitation, unemployment, work environment, education and agriculture and food production. The fourth layer is the general socio-economic, cultural and environmental conditions (Dahlgren & Whitehead, 1991). Earle et al. (2007) summarise that the inner layer suggest that health is partly determined by individual lifestyle factors, and Dahlgren and Whitehead (1991) emphasise that physical activity is one of the individual lifestyle factors which has great significance for individual health. Moving outwards the diagram focuses on the relationship with family, friends and significant others, within the local community. The outer layer includes among others, economic development, shifts in welfare systems, political change, social forces and structures. Earle et al. (2007) also emphasise that even though it is not presented in the model there is a potential for layer-to-layer interaction, such as cutbacks in welfare services might adversely affect peoples access to acceptable housing, and that may influence their health.

5. Materials and methodes

This chapter aims to provide an explanation of methodological choices. This project used a quantitative approach, with a quasi-experimental within-subjects design. The fist part of this chapter discuss the general methodology, before the instruments and the procedure is described.

During the project the following variables were measured:

1. Background information
    1.1. Recruit questionnaire including socio-demographic information
    1.2. Self reported health, SF-12v2 Health Survey
2. Motivation
    2.1 Recreational Exercise Motivation Measure (REMM)
    2.2 Motivation for participating in Birkebeinerrennet 2015
    2.3 Own opinion of health benefits from participating
3. Health indicators
    3.1 Blood pressure
    3.2 Body composition
    3.3 Maximal oxygen uptake

5.1 Quantitative approach

Bryman (2008) explains quantitative research as a research that usually emphasises quantification in the collection and analysis of data. As a research strategy it is deductivist and objectivist. Still, Bryman (2008) underlines that quantitative researchers do not always subscribe to all three of these features. Bryman (2008, p. 693) define deductive as “an approach to the relationship between theory and research in which the latter is conducted with reference to hypotheses and ideas inferred from the former”. This is also emphasised in this project, when research regarding participants in MSE is used when formulating the research questions. The objectivism is by Bryman (2008, p. 696) defined as “an ontological position that assert that social phenomena and their meanings have an existence that is independent of social actors”. In contrast the constructionism is defined as “an ontological

position (often also referred to as constructivism) that assert that social phenomena and their meanings are continually being accomplished by social actors" (Bryman, 2008, p. 692).

5.1.1 The main preoccupations of quantitative research

Bryman (2008) describes four distinctive preoccupations that can be discerned in quantitative research, measurement, causality, generalization, and replication.

Measurement implies that if a concept may be used in quantitative research it must be measured. There are three main reasons for the preoccupation with measurement in quantitative research. First, measurement allows the researcher to delineate fine differences between people in terms of the characteristic in question. It is often possible to distinguish between people in terms of extreme categories, but small differences are much more difficult to detect. Second, measurement gives the researcher a consistent device or yardstick for making such distinctions. Third, measurement provides the basis for more precise estimates of the degree of relationship between concepts (Bryman, 2008).

Causality is a very strong concern in most quantitative research. Quantitative researchers could in addition to explaining how things are, want to say something about why things are the way they are. The researcher may seek to give the explanation in terms of personal characteristics or in terms of social characteristics. A criterion for good quantitative research is frequently the extent to which there is confidence in the researchers causal inferences (Bryman, 2008).

Generalisation focuses on the fact that findings can be generalised beyond the confines of the particular context in which the research was conducted. There is a desire that the result should apply to individuals others than those who responded in the project. In quantitative research it is not possible to apply to the whole population of interest and therefore it has to be made a sample. The sample should represent the population of interest, and that render the possibility to generalize the findings beyond the cases that make up the sample (Bryman, 2008).

Replication concerns whether researchers are able to complete the exact similar project and get the same results. The result of a piece of research should be unaffected by the researchers characteristics of expectations. If there were a failure to replicate, a question would be raised about the validity of the findings in the project. Researchers attempt to be highly explicit about their procedures (Bryman, 2008).

5.2 Quasi-experimental design

A quasi-experimental design is used in this project. A Quasi-experiment is described as "a research design that is close to being an experiment but that does not meet the requirements fully and therefore does not exhibit complete internal validity" (Bryman, 2008, p. 697). This design has certain characteristics of experimental design. Different types of quasi-experiments have been identified. One of these experiments occurs in the case of "natural experiments". "These are "experiments" in the sense of entailing manipulation of a social setting, but as a part of a naturally occurring attempt to alter social arrangements" (Bryman, 2008, p. 41). Most documents on quasi-experimentation discount natural experiments, in which there is no control group or basis for comparison, however occasionally one comes across a single group natural experiment that is particularly striking (Bryman, 2008). A control group is not used in this project, but the measurements are repeated within the same sample group.

In a quasi-experiment the units are not assigned to conditions randomly (Shadish, Cook, & Campbell, 2002). These characteristics will also be seen in this project. Since this design is lacking full experimental control it becomes essential that the researcher is thoroughly aware of which specific variables his/her particular design fails to control (Campbell, Stanley, & Gage, 1963). With quasi-experimental design the participants choose treatment for themselves, which is called self-selection, or others decide which persons should get which treatment (Shadish et al., 2002). In this project the participants themselves decide which treatment, or preparations they choose to do. It will not be possible to see which participants who choose which preparations, but it will be possible to see if the participants have changes in the some of the variables of interest.

5.3 Approach to theory

The theoretical framework on motivation in this project is SDT, and motivation will be seen as an important factor. This supports the use of Recreational Exercise Motivation Measure (REMM). The REMM is a unit of measure that measures individual differences in motivation, associated with intrinsic and extrinsic motivation. Rogers and Morris presented the REMM in 2003 (Rogers, 2000). The measuring of motivation was completed with the REMM questionnaire with the interest in examining the participant's motivational drive for regular exercise.

It is expected to be a greater participation among those with a higher income, higher education, and among men. This based on findings in previous research and studies (Carlsson et al., 2007; Skare, 2011). In addition to SDT, social-demographic information on the participants in Birkebeinerrennet will be examined to implement the information collected in this sample. The Model of social determinist of health will also be used to further explain the concept of influences on health.

The health indicators will be measured with different health variables presented with measuring's of physical fitness. This requires several considerations regarding time, equipment and costs. When considering testing physical fitness one has to consider request to validity and reliability, costs, accessible equipment and the size of sample (Øverby, Torstveit, Høigaard, & Stene-Larsen, 2011).

5.3.1 The sample

When completing a study investigators typically want to gain information about the features of a particular group, whether they are health practitioners, or others. The starting point for a sampling scheme is the definition of a "target population"; the population of interest to the proposed investigation (Saks & Allsop, 2013). The "target population" in this project is the first time participants in Birkebeinerrennet 2015. The aim of identifying the population "of interest" is to ensure that the results of the sample selection and the subsequent analyses of the data are reflective of the defined sets of participants. Design, cost and logistics dictate whether there should be more than one stage of sampling (Saks & Allsop, 2013). To minimizing the error of sample estimates, sample size is a central consideration. Accuracy

and precision are the two components to the error term associated with a sample-based estimate of a population parameter. Sample size effects precision, but not accuracy. The larger the size of the sample, the more precise the estimates derived from the sample are likely to be. Achieving a high level of precision is not always possible because the larger the sample, the higher the cost of the study (Saks & Allsop, 2013). The sample in this project is a strategic selection. It is a selection among first time participants in Birkebeienrrennet 2015, who were interested in taking part in this project. The participants in this project were volunteers.

5.4 Instrument description

The testing instruments for maximal oxygen uptake, body composition and blood pressure are used in this project. In addition, surveys on motivational for exercise, motivational drive for participating in MSE, self-reported health, the recruit questionnaire including social background information, and the questionnaire on the participant's own opinion on the effect of entering a MSE on their lifestyle habits.

The maximal oxygen uptake was tested on a Woodway GmbH, D-79576 treadmill, Deutschland. The mask was Hans Rudolph 7450 V2 small. The hose was a Ventilation hose, 4 meters. The analysing was completed with an Oxygen Jaeger Oxycon Pro, which was calibrated with a Hans Rudolph calibration pump, 3 litres. During the test the participants wore the mask, a nose clip, and Polar Electro Oy, Finland heart rate monitor. The lactate measurement was taken with the Lactate Biosen C-line – Clinic/GP+, UK. The maximal oxygen test is the gold standard in the assessment of exercise tolerant, and better cardiorespiratory fitness is associated with lower risk of all-cause mortality (Kodama et al., 2009; Vanhees et al., 2005). The body composition was measured with an InBody720. The InBody720 has indicated high validity and accuracy, and documentary evidence compare the InBody720 with the Dual Energy X-Ray Absorptiometry (DEXA) ("Hvor nøyaktig er InBody?," 2008). The instrument for measuring blood pressure is used both to present the systolic and diastolic blood pressure, and as a reliability before the maximal oxygen uptake test. In this project blood pressure was tested with an OSZ 5 easy automatic blood pressure monitor, USA. In cases of measuring blood pressure 180/110 mmHg or higher (sincere

hypertension), the participants were excluded from the maximal oxygen uptake test (Anderssen et al., 2010).
It will be given a further explanation on the questionnaires used later in this chapter. The access to equipment and the costs was an important factor for the choice of instruments used in this project.

The REMM questionnaire was used to answer what the motivation for exercise was among the participants, and the questionnaire regarding motivation for participating in a MSE was used to categories the most important motivational factors for participating in a MSE among first time participants. The questionnaire on the participant's own opinion on the effect of entering this MSE was used as a supplement in giving a further explanation on the changes in lifestyle habits. The instruments for testing maximal oxygen uptake, body composition and blood pressure was used to answer the research question regarding the effect of entering a MSE can lead to enhanced health. The background information and self-reported health was used to present the sample, and give a further explanation about who are the first time participants in this MSE, in this sample. Also the relation between the variables was examined.

5.4.1 Motivation

When assessing the motivational drive for regular exercise, a modified version of the REMM was used. REMM was developed as a reliable and valid test of the full range of goals that can be used as a tool in research on motivation for recreational exercise participation (Rogers, 2000). The original REMM has been design to measure adult's physical activity motivation and consist of 73 items (Aaltonen et al., 2014). In this project, a modified 8-items questionnaire made by Rogers and Morris in 2003 was used. The categories in this questionnaire consist of: mastery, physical fitness, affiliation, psychological, appearance, others expectations, enjoyment and competition/ego. The project manager translated the REMM from English to Norwegian, see appendix 3.

A specific question from Birken´s marked surveys in 2010, 2012 and 2013 was used to investigate what motivates the participants to participate in Birkebeinerrennet (Birken, 2010; Bruland & Eide, 2012, 2013), see appendix 4. It is a multiple-choice question, and the question consists of nine choices in addition to a choice were the participants could write a

comment. The different alternative answers were divided into the category's; health, exercise goal, the social aspect, the competition, social pressure/support from the workplace, social pressure/support from friends/training team, performance goal and performance challenge. In both motivational questionnaires the participants ticked off all the answers they felt represented their motivational factor for exercising, or participating in this MSE.

With a wider interest in the MSE participants a supplementary question was made. The question concerns the participant's own opinion on the effect of entering Birkebeinerrennet, if taking part in this event has lead to be more physical active, and have more healthy habits. It is a yes- or no question, with the possibility to write a comment, see appendix 5.

5.4.2 The health indicators

Physical fitness

Physical fitness indicates an individual's capacity in physical activity, and is defined as "the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to engage in leisure time pursuits and to meet the above-average physical stresses encountered in emergency situations" referred in Vanhees et al. (2005, p. 107). Physical fitness involves endurance, muscular strength, mobility, coordination and balance (Øverby et al., 2011). Is it also usually divided in performance related fitness and health related fitness. Health related fitness is most important considering public health (Caspersen et al., 1985). Health related physical fitness is a condition characterized by 1) having the energy to fulfil the everyday request, and 2) physiological characteristics and qualities recognized with low risk of developing lifestyle diseases and illness (Øverby et al., 2011). Vanhees et al. (2005) summarises Bouchard and Shepard (1994), and describe five main components in physical fitness: morphologic component, cardiorespiratory component, muscular component, motoric component and metabolic component. In this project the morphologic component as body composition and cardiorespiratory component as maximal aerobe capacity is used when investigate at the participants health related fitness.

Cardiorespiratory component - Maximal oxygen uptake

When measuring physical fitness aerobe endurance is the variable that is mostly used, and the most valid measurement of aerobe endurance is direct measurement (Vanhees et al., 2005; Øverby et al., 2011). Physical fitness is typically expressed as cardiorespiratory fitness, and maximal oxygen uptake test is often used when testing cardiorespiratory fitness. Better cardiorespiratory fitness is associated with lower risk of all-cause mortality, coronary heart disease and cardiovascular disease (Kodama et al., 2009). This level can improve with 20 to 50 % in two to six months with sufficient training with the right intensity. Still there are large individual differences with the effect training has on each individual (Henriksson, Karlsson, Larsen, Bahr, & Helsedirektoratet, 2009).

Measuring maximal oxygen uptake is very accurate, but require the right equipment, enough time, and it might be expensive (Øverby et al., 2011). A treadmill was used when the maximal oxygen uptake test was completed in this project. It is seen that the peak $\dot{V}O_2$ ventilator threshold and minute ventilation are generally 10-20 % higher with a treadmill testing, than cycling testing (Vanhees et al., 2005).

Cooper and Storer (2001) has defined fitness categories for both males and females based on $\dot{V}O_{2\ max}$ expressed in ml*kg^{-1}*min^{-1}. This is completed with the use of three studies by American Heart Association, 1972, Cooper, K. H., M. L., Wilmore, J. H. & Fox, S. M., 1978 and Åstrand, I., 1960. Since there are used three studies there is an overlap between the various categories. The fitness is categorizes by age; 20-29 years, 30-39 years, 40-49 years, 50-59 years and 60-69 years. The $\dot{V}O_{2\ max}$ level is also categorized as low, fair, average, good and high based on the $\dot{V}O_{2\ max}$ expressed in ml*kg^{-1}*min^{-1}.

Presenting the categories males 20-29 years, the average $\dot{V}O_{2\ max}$ is by Cooper and Storer (2001) estimated to be between 34-51, good $\dot{V}O_{2\ max}$ between 43-56, and a high $\dot{V}O_{2\ max}$ from 48 and above. In the category males 30-39 years, the average $\dot{V}O_{2\ max}$ is between 31-47 ml*kg^{-1}*min^{-1}, good $\dot{V}O_{2\ max}$ between 39-51 ml*kg^{-1}*min^{-1}, and a high $\dot{V}O_{2\ max}$ from 46 ml*kg^{-1}*min^{-1} and above. In the category males 40-49 years, the average $\dot{V}O_{2\ max}$ is between

27-43 ml*kg^{-1}*min^{-1}, good $\dot{V}O_{2\ max}$ between 36-47 ml*kg^{-1}*min^{-1}, and a high $\dot{V}O_{2\ max}$ from 45 ml*kg^{-1}*min^{-1} and above. In the category females 20-29 years the average $\dot{V}O_{2\ max}$ is between 29-43 ml*kg^{-1}*min^{-1}, good $\dot{V}O_{2\ max}$ between 34-48 ml*kg^{-1}*min^{-1}, and a high $\dot{V}O_{2\ max}$ from 38 ml*kg^{-1}*min^{-1} and above. In the category females 40-49 years the average $\dot{V}O_{2\ max}$ is between 24-40 ml*kg^{-1}*min^{-1}, good $\dot{V}O_{2\ max}$ between 31-45 ml*kg^{-1}*min^{-1}, and a high $\dot{V}O_{2\ max}$ from 42 ml*kg^{-1}*min^{-1} and above.

The participants in this project completed the maximal oxygen uptake test running on a treadmill. The warm up and test protocol was explained to the participants in advance. During the warm up the protocol for the specific test was repeated. The warm up started with five minutes adaption to the treadmill with walking, and than increasing the speed gradually to a comfortable running speed. All the participants completed the whole 20 minutes warm up at an incline and speed at the starting speed and incline or lower. The incline was set to 5,3 % for both genders, due to the recommendation given by Hem and Leirstein (n.d), and was constant through the whole test. Men started the test at 8 km/h and women at 7 km/h and the speed was increased each minute. The importance of endures to exhaustion was emphasised for the participants, both before the test and during the warm up. In addition, the test protocol was explained to the participants both before the test, and during the warm up. An explanation was given regarding the increase in speed and that the participant should agree for the speed to increase, thumbs up or down. The participants were also told to hold the last speed they increased to, for one minute. During the test the participants ran the whole time with the mouthpiece and nose clip. One minute after the test had come to an end a lactate measurement was completed as a part of the end criteria for achieve maximal oxygen uptake. A small blood sample was taken and analysed as a part of the criteria for reaching $\dot{V}O_{2\ max}$. Edvardsen, Hem, and Anderssen (2014) end criteria for $\dot{V}O_{2\ max}$ was used to be certain the participants reached their $\dot{V}O_{2\ max}$. The end criteria was divided in the categories; blood lactate concentration (mmol*L^{-1}), Respiratory Exchange Ratio given for age and gender, and plateau.

Morphologic component - Body composition

Body mass for height, body composition and abdominal visceral fat refer to components of body composition are associated with obesity, type 2 diabetes, hyperlipidaemia, hypertension and cardiovascular disease (Vanhees et al., 2005). As mentioned Vanhees et al. (2005) present measuring aerobe endurance is frequently used when measuring physical fitness. However, other components such as muscular strength is also important, and is associated with good health and reduction in the risk of chronic diseases (Øverby et al., 2011). The instrument used to measure morphologic component in this project is the InBody720. The InBody720 is a measuring instrument that identifies muscle mass, body fat, metabolism and body balance (Bjartlo, 2008). In this project weight in kg, muscle mass in kg, body fat in kg, waist-hip ratio (WHR) and visceral fat area were used as variables. Based on two reports the World Health organization (WHO) has given recommendations regarding WHR. The recommendation for WHR for men is $\geq$ 0,90 cm, and among woman $\geq$ 0,85 cm. WHO also emphasises that the risk of metabolic complications are substantially increased with a higher WHR than recommended (World Health Organization, 2011).

Blood pressure

Hypertension or high blood pressure is the most important modifiable risk factor for cardiovascular diseases and death (Henriksson et al., 2009). The higher existence of hypertension seems to be related to life habits, such as obesity, physical inactivity and a high consumption of salt. Research indicate that endurance training reduce the blood pressure, but is must consist of regular physical activity (Henriksson et al., 2009)

Recommendations by The Norwegian Directorate of health categorise an optimal systolic blood pressure to be < 120 mm Hg and the optimal diastolic blood pressure to be < 80 mm Hg. They further categorise a normal systolic blood pressure to be < 130 mm Hg, and a normal diastolic blood pressure to be < 85 mm Hg. A high systolic blood pressure is regarded to be 120-139 mm Hg, and a high diastolic blood pressure between 85-80 mm Hg. The first extent of mild hypertension is a systolic blood pressure between 140-159 mm Hg, and a diastolic blood pressure between 90-99 mm Hg (Henriksson et al., 2009).

5.4.3 Socio-demographic information and self reported health

Socio-demographic information from the participants was collected in the recruit questionnaire, see appendix 1. The participants were asked to fill in their gender, age, place of living, income, highest education, earlier experience with MSE and if they were willing to participate in this project. These data was collected to compare the sample in this project with the participants in MSE, and to use the socio-demographic information when calculating the associations between the different variables.

Self reported health was measured using SF-12v2 Health survey, see appendix 2. The - SF12v2 Health survey is a survey with 12 questions to measure functional health and well being, this from the patient's point of view. The SF-12v2 takes only two to three minutes to complete, and covers the same eight health domains as the SF-36v2. The SF-12v2 is the result of the construction of a single-page health survey that is useful in monitoring outcomes in general and specific population (Optum, 2014). The scores used to describe the sample in this project are the physical health scores and the mental health scores. Ware and Kosinski (2001) present that each score have the same mean (50), and standard deviation (10) in the general U. S. population. With a score below 50, the health status is below the average relative to the general U. S. population, and each point is one-tenth of a standard deviation. Ware and Kosinski (2001) emphasis that scale scores and summary measures generally range from 20-70. The SF-12v2 Health survey presents the five physical health scores: Physical Component Summary (PCS), Physical Function (PF), Role Physical (RP), Bodily Pain (BP) and General Health (GH). In addition to the five mental health scores: Mental Component Summary (MCS), Vitality (VT), Social Function (SF), Role Emotional (RE) and Mental Health (MH).

Ware and Kosinski (2001) present a description of the mentioned physical and mental health scores. Substantial limitations in self care, physical, social, and role activities; sever bodily pail; frequent tiredness; health rated "poor" is described as PCS at the lowest. No physical limitations, disabilities, or decrements in well being; high energy level; health related "excellent" is described as PCS at the highest. PF is described as performance of physical activities such as self-care, walking, and vigorous physical activities. RP is the degree to which a persons typical role activities (e.g., childcare, job) are limited by physical health. BP is described as intensity, duration, and frequency of bodily pain and limitations in usual

activities due to pain. GH is the beliefs and evaluations of a person´s overall health. MCS at the lowest is described as frequent psychological distress, substantial social and role disability due to emotional problems; health in general rated "poor". MCS at the highest is described as frequent positive affect; absence of psychological distress and limitations in usual social/role activities due to emotional problems; health rated "excellent". VT is described as feelings of energy, the absence of fatigue. SF is described as the degree to which a person develops and maintains social relationships (e.g., with family, friends, etc.). RE is described as the degree to which a person´s typical role activities (e.g., childcare, job) are limited by emotional problems. The last of the mental health scores is the MH which is a person´s emotional, cognitive, and intellectual status (Ware & Kosinski, 2001).

5.5 Procedure

The 16th of October 2014 the following message was posted on Birken´s Facebook page; "Hi all first time participants in Birkebeienerrennet 2015. In my master thesis I will investigate motivation and health indicators among first time participants in Birkebeinerrennet 2015. I hope you are interested in participating in this project. We will go through the results and you will be able to measure maximal oxygen uptake, body composition and blood pressure. These tests are free. Enter this link if this is of any interest… " This was the stage of recruiting participants for this project. The link lead to the recruit questionnaire which collected background information about the participants: gender, age, county, income, education, earlier experience with mass sport event, and their interest in participating in this project. The criteria for participation were being a first-time participant in Birkebeinerennet 2015. Those interested in taking part in this project was contacted and given further information about the project. An appointment was made for the time of testing. A total of 14 participants were interested in participating, the final sample were 8. Through the information letter the participants were again made aware of the tests they should complete. Moreover, preparations for the different tests were made clear in the information letter. The testing took place at the test laboratory at Hedmark University Collage, Terningen Arena. The project manager carried out the data collecting among all participants. The 14-week before the event test took place from the 10_{th} to the 19_{th} December 2014. The 1-week before the event test took place from the 12th to the 17th of March. The start time for the tests appeared from 9 AM to 6 PM.

The participants were first welcomed and introduced to the different tests, they were given the opportunity to ask questions or get more information about the procedure. In the 14-week before the event test the participants were asked to read and sign the written consent, see appendix 8. The first questionnaire the participants filled out was the motivational factors for exercise, using a modified version of the REMM (appendix 3). The second measuring was the self-reported health measured with the SF-12v2 (Appendix 2). In both questionnaires the subjects were given an explanation and could ask questions if anything was unclear. The third was to measurement blood pressure. This test was completed after five minutes of rest. Only one size on the cuff was used on all participants. The cuff was placed on the right upper arm, when only wearing a t-shirt and nothing tightened on the upper body. The cuff was placed 2-3 cm above the elbow pit. The measurement was carried out through the recommendation given by the Norwegian government (Helsedirektoratet, 2011b). There were 3 measurements for each participant separated with one minute. All three measurements were logged, and the average of the last two measurements is used in the analysis.

The fourth measurement was the body composition. Measuring body composition was carried out before the physical test because physical activity may influence the results of the InBody720 (www.bodyanalyse.no, n.d.) The measurement was carried out as explained in the user manual for InBody720 ("User´s manual," 2004). Before the test the participant were asked to go to the toilet, and than stand for five minutes before the test. During the test the participant stood relaxed at the platform with both feet placed on the oval shaped electrodes. Participant held the two handles; four fingers covered the backside of the handles and the thumb covered the electrode on the front side. The process of the InBody720 analyses took approximately two minutes where the participants stood still and did not talk. The participants were asked to follow the recommendations in the information letter before the test, but it was no further following up regarding this recommendations. These recommendations is presented by ("User´s manual," 2004), and included not eating the last two hours before the test, do not exercise the same day as the tests should be conducted, and avoid showering or sauna right before the testing.

The last measurement was the maximal oxygen uptake test. The process of the maximal oxygen uptake test is described in the instrument description. After the tests were conducted

the participants were given a through review of the results of the different tests, and was able to ask questions regarding the tests and the results.

In the 1-week before the event test the first measuring was motivation for participating in Birkebeinerrennet 2015. The subjects were given an explanation if the question was unclear. The second measurement was the blood pressure, the third measurement was the body composition, the forth measurement was the maximal oxygen uptake test. These measurements were completed as described in the 14-week before the event test. The last measurement was regarding the participants own opinion of health benefits from participating, see appendix 5. The question concerned the participant's own opinion on change in lifestyle habits when entering Birkebeinerrennet as a MSE. The subjects were given an explanation if the question was unclear.

5.6 Statistical analyses

In this project the data were analysed using Microsoft Excel for Mac 2011, version 14.4.7 (Microsoft Corporation, Santa Rosa, California, USA). The exploratory analysis was conducted with a stem and leaf in the search for outliners. The stem and leaf present the distribution in the sample, and explored few outliners in the variables, and close to a normal distribution although there was a small sample. In addition, the delta between the 14-weeks before the event test, and the 1-week before the event test was calculated to explore the changes in the health variables. The formula for delta is presented as ΔV, or $V_1 - V_2$.

The descriptive statistic presents the socio-demographic information among the participants, with a table presenting the numbers of the total sample in each group, and the percentage. The self-reported health is presented with the mean of the participants, both descriptive and with a figure presenting the participant's results, calculated with the analysing program from the SF-12v2.

A paired sample t-test was calculated with a self-produces excel sheet with formulas to investigate the changes form the 14-week before the event test´s to the 1-week before the event test´s. The formula for a paired sample t-test is $\frac{\sum D}{\sqrt{\frac{(n \times D^2) - \sum D^2}{n-1}}}$

A self-produced excel sheet was used to calculate the paired sample t-test. The sheet presented the results from the 14-week before the event test, the results from the 1-week before the event test, the differences and squared differences, also the sum of these and the number in the sample. The different formulas in the excel sheet were given the letters A, B, C, D, E and F. A was the sum of the differences. B was the numbers of observations multiplied with the squared differences. C was the square in the sum of the differences. D was the sample size minus one. E was B minus C, divided by D. F was the square root of E. The final t-test was than A divided by F. The statistic significant level was determent by table 2 presented by Bjørndal and Hofoss (2004) .

Cohen´s d was calculated to estimate the effect size of the changes in the health indicators. Cohen´s d is a calculation of the mean 14-weeks before the event test minus the mean of the 1-week before the event test, divided by the standard deviation average. Cohen´s d indicates the effect size of the difference between the 14-week before the event test and the 1-week before the event test. A Cohen´s d from 0 to .20 is characterized as small, a Cohen´s d from 0.20 to 0.50 is characterized as medium, and a Cohen´s d < .50 is characterized as large (Cohen, 1992). The formula for Cohen´s d is $\frac{x_1 - x_2}{s_{pooled}}$

S_{pooled} is calculated with the formula $\sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2}}$

Pearson product-moment correlation (r) was used to investigate the association between the changes in health indicators (delta values) and the social demographic distribution variables. The formula for Pearson product-moment correlation is $\frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 (y - \bar{y})^2}}$

The excel functions were used to calculate Pearson rho, and table 7 from Bjørndal and Hofoss (2004) where used to determine the significance level. Significant level was set as $p < 0,05$. The p-value indicates if it is a statistic significant difference in the results from the 14-

weeks before the event test to the 1-week before the event test. The p-values > 0,05 indicates the possibility of finding the 95 % confidence level.

The calculation of confidence intervals was also conducted with a self-produced sheet. The sheet presented all the variables found on one of the health indicators in one of the test periods. The sheet also presented the average, the standard deviation, calculated with the excel formula, the sample size, and the confidence coefficient. The margin of error was calculated taking the confidence coefficient multiplied with the standard deviation, divided by the square root of the sample size. The upper bound was calculated taking the mean plus the margin of effort, and the lower bound was calculated taking the mean minus the margin of effort. The equation for confidence interval is $\bar{x} - 1.96 \frac{\sigma}{\sqrt{n}}$

5.7 Ethical considerations

Ethics is an important consideration in research. Ethics is the learning about moral, what is right and wrong. Protecting the participant's in research projects is important, and the researcher should investigate with a fundamental respect for human dignity. This implies a concrete demand to the research proses to secure the participants, both their freedom, self-determination and to protect them against injury, and to insure their privacy (Ringdal, 2007).

The participants in research should gain information about the project, including the purpose, methods and possible negative consequences by participating. It is also important emphasising the participants are volunteers. As a basic principle a research project that include individuals, may only be started when the participants is informed and gave given their free consent. A free consent is given without pressuring the participant, and not wanting to participate should not involve a negative assents (Ringdal, 2007).

According to the personal data act all research and student projects, which include processing personal data, should be reported to NSD (Norsk Samfunnsvitenskaplig database) (Ringdal, 2007). This project was reported to NSD, and the answer is presented as appendix 9. This project was also reported to REK (Regionale komiteer for medisinsk og helsefaglig forskningsetikk) and the answer is presented as appendix 10.

6. Restults

This chapter will present the results of the findings in this project. The sample description will first be presented, then the results on the motivation for exercise and attending the MSE Birkebeinerrennet. Also, the changes in the health indicators will be presented, as well as the association between the changes and the participant's own opinion of the effect of entering Birkebeinerrennet.

6.1 Sample description

6.1.1 Socio-demographic information

This chapter will present the sample in this project, and the sample distribution. Table 1 present the sample distribution of gender, age, education and income in this project. It was a total of 5 males in this project, and a total of 3 females. The sample is spread from the age group of 20-29 years, 30-39 years and 40-49 years. The age group 20-29 years consist of 5, the age group 30-39 years consist of 1, and the age group 40-49 years consist of 2. The level of education was divided in three groups; compulsory primary/secondary school, high school and higher education. As presented in table 1 the participant's educational level was spread between Upper secondary school and higher education, and non with primary school. The sample with Upper secondary school was a total of two, and the sample with higher education was a total of 5. The level of income was divided in five groups: below 150.000, 150.000-300.000, 300.000-450.000, 450.000-600.000 and more than 600.000. The sample was spread in the groups of an income below 150.000 NOK, 300.000-450.000 NOK and 450.000-600.000 NOK. The income distribution consists of 4 with an income below 150.000 NOK, 2 with an income between 300.000-450.000 NOK and 2 with an income between 450.000-600.000.

Table 1: Socio-demographic information (n = 8)

Gender	Frequency	Percent
Female	3	37,5
Male	5	62,5
Age		
20-29	5	62,5
30-39	1	12,5
40-49	2	25
Education		
High school	2	25
Higher education	6	75
Income		
Below 150.000	4	50
300.000-450.000	2	25
450.000-600.000	2	25

6.1.2 Self reported health

Figure 1 present the results of the SF-12v2 Health survey. The SF-12v2 Health survey presents the scores for the total sample on physical health scores: Physical Component Summary (PCS), Physical Function (PF), Role Physical (RP), Bodily Pain (BP) and General Health (GH). In addition the figure present the score for the total sample on mental health scores: Mental Component Summary (MCS), Vitality (VT), Social Function (SF), Role Emotional (RE) and Mental Health (MH). The whole sample was above the general U. S. population. The physical health scores were; 55,71 on PCS, 57,06 on PF, 55,87 on RP, 54,35 on BP and 53, 96 on GH. The mental health scores are 54,19 on MCS, 57,67 on VT, 53,57 on SF, 54,33 on RE and 54,89 on MH.

Figure 2: Physical and mental health scores for the total sample, SF-12v2

6.2 Motivation

6.2.1 Motivation for exercise

Figure 2 present on a scale from one to five how important different motivational factors are for the participants exercising. This is presented as the median. The questionnaire REMM (appendix 1) is explained in the method chapter. Mastery (Median = 5; IQR = 0,5), physical fitness (Median = 5; IQR = 0,0), enjoyment (Median = 5; IQR; 0,0) and psychological state (Median = 5; IQR = 1) were valued as the most important motives for PA. These were followed by affiliation (Median = 4,5; IQR = 1,25), appearance (Median = 3,5; IQR = 1,25), competition/ego (Median = 2,5; IQR = 1,25) and others expectations (Median = 2; IQR = 2).

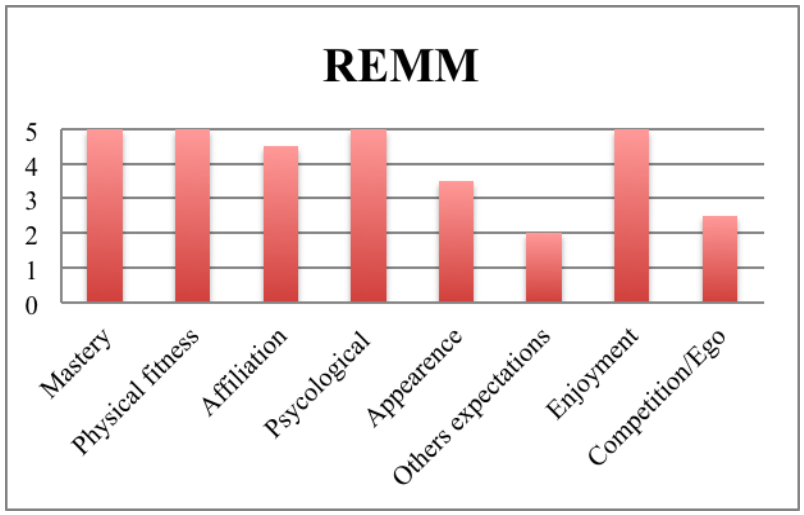

Figure 3: REMM, motivational factors for exercising, presented with median

6.2.2 Motivation for participating in Birkebeinerrennet 2015

When exhibit the results on motivation towards participating in Birkebeinerrennet all of the participants reported Birkebeinerrennet to be a motivating exercise goal. Six of the participants reported that one of the motivational factors for participating in Birkebeienerrennet was the personal challenge. Four participants reported that the competition was one of the motivational factors. Two participants answered it was in consideration to their own health, one reported the social aspect, and one of the participants reported performance goal as a motivational factor. No one answered that is was because of

social pressure/support from the workplace, or social pressure/support from friends or a training team.

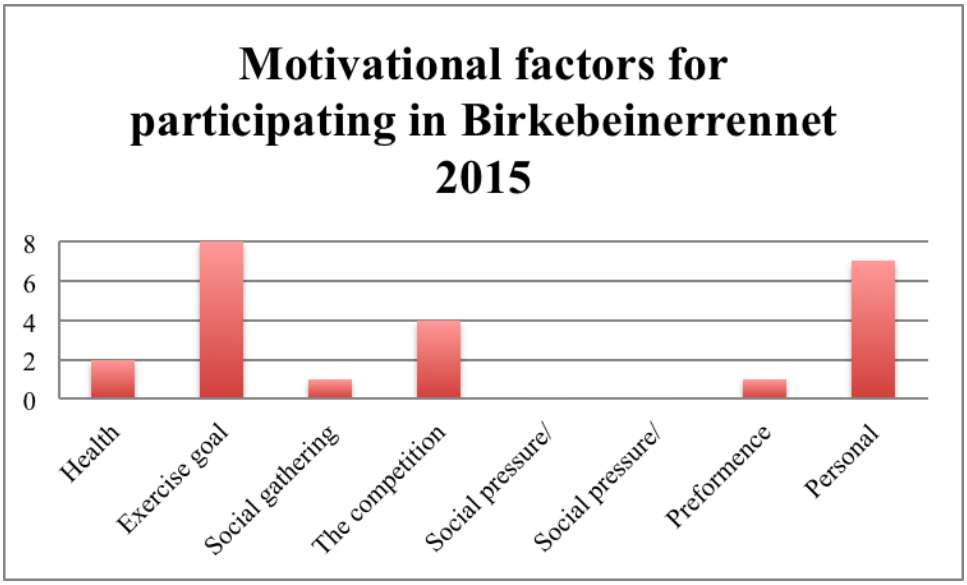

Figure 4: Motivational factors for participating in Birkebeinerrennet 2015, numbers reported

6.2.3 The effect of entering Birkebeinerrennet, the participants self assessment

In the results on the supplementary questionnaire regarding the participants opinion on the effect of entering Birkebeinerrennet, six out of eight answered that they thought their participation in Birkebeinerrennet lead them to be more physical active and have more healthy habits. The comments that was written was “I have been doing more outdoor activity, and it has been a good experiences that I will take with me in the future”, “ in stead of laying down on the sofa after work, you think about Birkebeinerrennet and go for an extra skiing trip. Makes you go longer skiing trips and you set a goal of one long trip every weekend because of Birkebeinerrennet”, “It (Birkebeinerrennet) lead to more activity during the winter-time. Usually I run a lot, but I was not able to do that because of all the snow. Because of Birkebeinerrennet I had to practise a lot of skiing” and “Birkebeinerrennt is just one goal. I have many others”.

6.3 Changes in health indicators

A paired sample t-test was conducted to compare the variables $\dot{V}o_{2\ max}$, weight, body fat (kg), muscle mass (kg), WHR, visceral area fat and blood pressure in the 14-week before the event test, and the 1-week before the event test. The results will be described below.

Table 2: Health indicators measured 14- and 1-weeks before the event (n=8)

	14-weeks before test			**1-week before test**			**Delta**
	Mean	**SD**	**95% CI**	**Mean**	**SD**	**95% CI**	
$\dot{V}o_{2\ max}$ (ml*kg^{-1}*min^{-1})	53,85	6,56	(49,30-58,38)	57,2	6,00	(53,10-61,42)	3,41
Muscle mass (kg)	33,78	5,47	(29,99-37,57)	33,73	5,10	(30,19-37,27)	-0,05
Body fat (kg)	13,88	6,53	(10,68-17,08)	12,86	5,81	(10,01-15,71)	-1,02
WHR	0,87	0,045	(0,83-0,90)	0,86	0,04	(0,83-0,89)	-0,01
Visceral fat area	71,05	28,94	(50,99-91,10)	62,45	26,72	(43,93-80,96)	-8,6
Weight	73,75	10,07	(66,77-80,72)	72,55	8,92	(66,36-78,73)	-1,2
Systolic blood pressure	129,12	7,45	(123,96-134,28)	127,75	12,61	(119,01-136,48)	-1,37
Diastolic blood pressure	79,25	9,14	(72,91-85,58)	79,5	6,94	(74,68-84,31)	0,25

There was a statistic significant change in the results for body fat (kg) from the 14-week before the event test *(m* = 13,88, *s* = 6,03) compared to the 1-week before the event test (*m* = 12,08, *s* = 3,44), $t_{(7)}$ = 2,42, p ≤ .05. These results suggest that participating in MSE can influence the level of body fat (kg). There was also a statistic significant change in the results for $\dot{V}O_{2\ max}$ level from the 14-week before the event test *(m* = 53,85, *s* = 6,05) compared to the 1-week before the event test (*m* = 57,26, *s* = 5,52), $t_{(7)}$ = 3,26, p ≤ .02. These results suggest that participating in MSE may influence the $\dot{V}O_{2\ max}$ level when using a 95 % confidence. These results will be discussed further, also in consideration to validity.

There was not statistic significant change in the level of muscle mass (kg) from the 14-week before the event test *(m* = 33,78, *s* = 5,01) compared to the 1-week before the event test (*m* = 33,73, *s* = 4,67), $t_{(7)}$ = -0,12, p ≥.05. These results suggest that participating in MSE do not influence the muscle mass level (SMM kg), and these results do not find any connection between participating in a MSE and an increased level of muscle mass level (SMM kg). Also there was not statistic significant difference in the results for weight (kg) from the 14-week before the event test *(m* = 73,75, *s* = 9,36) compared to the 1-week before the event test (*m* = 72,55, *s* = 8,28), $t_{(7)}$ = -1,37, p ≥.05. These results suggest that participating in MSE do not influence the weight (kg).

Furthermore no statistic significant change was found in the results for WHR from the 14-week before the event test *(m* = 0,87, *s* = 0,99) compared to the 1-week before the event test (*m* = 0,86, *s* = 0,99), $t_{(7)}$ = -1,17, p ≥.05. Strongly connected to WHR is visceral fat area. There was also not statistic significant change in the results for visceral fat area from the 14-week before the event test *(m* = 71,05, *s* = 27,05) compared to the 1-week before the event test (*m* = 62,45, *s* = 24,97), $t_{(7)}$ = -2,02, p ≥.05. These results suggest that participating in MSE do not influence the WHR and visceral fat area, but indicate that there are close to being a statistic significant finding with such few numbers of participants. This will be considered further in the discussion.

Table 3: Paired sample t-test, p-value and Cohen´s d

	Paired sample t-test	**p-value**	**Cohen´s d**
$\dot{V}o_{2\ max}$	3,26	< 0,05	0,54
Muscle mass (KG)	-0,12	> 0,2	-0,009
Body fat (KG)	-2,42	< 0,05	-0,16
WHR	-1,17	> 0,2	-0,25
Visceral fat area	-2,02	< 0,1	-0,30
Weight	-1,37	> 0,2	-0,12
Systolic blood pressure	-0,48	> 0,2	-0,13
Diastolic blood pressure	0,07	> 0,2	0,03

Table 3 present the paired sample t-test, and in addition the p-value and Cohen´s d. A statistic significant change is found on $\dot{V}o_{2\ max}$ ($p > 0,02$) and body fat (kg) ($p > 0,05$). The calculations from Cohan´s d present $\dot{V}o_{2\ max}$ with 0,54, characterized as large, and visceral fat area with -0,30, characterized as medium.

6.4 Association between the changes in health indicators and other variables

Table 4: An extract of the delta correlation table, motivational factors for exercise and health-indicators

	Motivational factors for exercise							
Health-indicators	Mastery	Physical fitness	Affiliation	Phychological	Appearance	Others expectations	Enjoyment	Ego
Systolic	0,660	-	0,494	-0,340	-0,503	0,596	0,482	0,335
Diastolic	0,501	-	0,081	-0,338	-0,501	0,236	0,237	-0,168
Weight	0,389	-	-0,262	0,361	0,153	0,667	0,164	0,304
Muscle mass	0,112	-	-0,323	0,533	0,472	0,664	0,092	0,395
Body fat	0,710*	-	-0,155	0,111	-0,279	0,495	0,228	0,154
WHR	0,359	-	-0,187	0,314	0,101	0,700	0,101	0,352
Visceral fat area	0,281	-	-0,196	0,478	0,304	0,766*	-0,017	0,428
$\dot{V}o_{2\,max}$	-0,269	-	0,206	-0,330	-0,176	0,654	-0,258	-0,444

* p-value < 0,05

Table 5: An extract of the delta correlation table, motivational factors for participating in a MSE and health-indicators

	Motivational factors for participating in a MSE							
Health indicators	Health	Exercise goal	The social	The competition	Social pressure/support from workplace	Social pressure/support from friends/ training team	Performance goal	Personal challenge
Systolic	0,105	-	-0,332	0,911*	-	-	0,570	-0,745*
Diastolic	-0,155	-	-0,192	0,717*	-	-	0,893*	-0,508
Weight	0,477	-	0,148	0,196	-	-	0,624	-0,424
Muscle mass	0,449	-	0,165	-0,170	-	-	0,423	-0,219
Body fat	0,477	-	0,177	0,559	-	-	0,583	-0,581
WHR	0,666	-	0,168	0,266	-	-	0,436	-0,444
Visceral fat area	0,595	-	0,044	0,203	-	-	0,354	-0,404
$\dot{V}o_{2\,max}$	-0,755*	-	-0,357	0,023	-	-	-0,289	0,330

*p-value < 0,05

Table 4 and 5 present an extract of the delta of the health indicators correlation with the motivational factors for exercising, and with the motivational factors for participating in this MSE. The delta between the 14-week before the event test and 1-week before the event test for systolic blood pressure (mm Hg), diastolic blood pressure (mm Hg), weight (kg), muscle mass (kg), body fat (kg), WHR, visceral fat area and $\dot{V}o_{2\ max}$ ($ml*kg^{-1}*min^{-1}$) is used in this correlation hence the interest in investigating a potential drive for more regular exercise, and the potential improved health. As presented in table 4 and 5, mastery correlated with body fat (kg) ($p < 0,05$), others experience (as a motivational factor for exercise) correlated with visceral fat area ($p < 0,05$), health (as a motivational factor for participating in Birkebeinerrennet) correlated with $\dot{V}o_{2\ max}$ ($p < 0,05$). The competition (as a motivational factor for participating in Birkebeinerrennet) also correlated with systolic blood pressure ($p < 0,05$), and diastolic blood pressure ($p < 0,05$). Performance goal (as a motivational factor for participating in Birkebeinerrennet) correlated with diastolic blood pressure ($p < 0,05$), and personal challenge (as a motivational factors for participating in Birkebeinerrennet) correlated with systolic blood pressure ($p < 0,05$).

Furthermore, correlations were found between other variables not presented in table 4 and 5. Age correlated with mastery (as a motivational factor for exercise) ($p < 0,05$), and own opinion ($p < 0,05$). Earlier experience with MSE correlated with mastery (as a motivational factor for exercise) ($p < 0,05$) and own opinion ($p < 0,05$). Others experience (as a motivational factor for exercise) correlated with ego ($p < 0,05$), and mastery (as a motivational factor for exercise) correlated with own opinion ($p < 0,05$). Muscle mass correlated with own opinion ($p < 0,05$), and body fat (kg) correlated with own opinion.

The correlation between the health indicator variables presented systolic blood pressure correlated, as expected, with diastolic blood pressure ($p < 0,05$), and body fat (kg) ($p < 0,05$). Diastolic blood pressure also correlated with body fat (kg) ($p < 0,05$). Weight correlated, as expected, with muscle mass (kg) ($p < 0,05$), body fat (kg) ($p < 0,05$), WHR ($p < 0,05$), visceral fat area ($p < 0,05$), and $\dot{V}o_{2\ max}$ ($p < 0,05$). Muscle mass correlated with WHR ($p < 0,05$), and visceral fat area ($p < 0,05$). Body fat (kg) correlated, as expected, with WHR ($p < 0,05$), and visceral fat area ($p < 0,05$). WHR correlated, as expected, with visceral fat area (p

< 0,05), and WHR correlated with $\dot{V}o_{2\ max}$ ($p < 0,05$). Also visceral fat area correlated with $\dot{V}o_{2\ max}$ ($p < 0,05$).

The variables physical fitness (as a motivational factor for exercise), exercise goal (as a motivational factor for exercise), social pressure/support from workplace (as a motivational factor for participating in Birkebeinerrennet), and social support from friends/ training team (as a motivational factor for participating in Birkebeinerrennet) is not possible to correlate with the other variables due to the same answers from the whole sample.

7. Discussion

This project has examined to what extend entering a MSE for the first time can provide a motivational drive for more regular exercise, and if this lead to improved health. This project has also investigated whether MSE has the potential to encourage individuals with a low level of physical activity, to enter a higher level of PA.

The results present mastery, physical fitness, psychological and enjoyment as the most important motivational factors for exercise, among the participants in this project. Exercise goal and personal challenge is seen as the most important motivational factors for participating in the MSE. Statistical significance was found in the results of the paired sample t-test for the health indicators body fat and $\dot{V}o_{2\ max}$. There was no statistical significance in the other health indicators. However, Cohen´s d presented a medium difference in visceral fat area. The correlation indicates several associations where mastery, as a motivational factor for exercising, correlated with change in body fat, and health, as a motivational factor for exercise, correlated with the change in $\dot{V}o_{2\ max}$ is seen as the most interesting findings.

7.1 Methodological discussion

7.1.1 Choice of quantitative approach quasi-experimental design

When the main preoccupations of quantitative research is presented in the method chapter, measurement, causality, generalization and replication is by Bryman (2008) described as the four distinctive preoccupations that can be discerned in quantitative research. Considering measurement in this project, the health indicators blood pressure, body composition and maximal oxygen uptake let the researcher to delineate fine differences between the participants, and makes the basis for more precise estimates of the degree of relationship between concepts. However, the research question on motivational factors for exercise does not delineate these differences between the participants in this project, and may be seen as a limitation. Presenting causality in this project and the wish to say something about why things are the way they are, it is clear that participating in MSE contribute to some changes in lifestyle habits that again lead to statistic significant changes in the health indicators maximal

oxygen uptake, and body fat. However, this project does not investigate if these changes are related to diet, exercise habits, or other changes that may influence these health indicators. In the wish to say something about why things are the way they are this project also support the research regarding exercise goal as an important motivational factor among sport participants. Generalization may be seen as this projects major limitation, due to the number of participants. Even though there is statistic significance in two of the health indicators the number of participants makes it not possible to generalize with these results. Nevertheless this project may indicate the health effect of entering this type of event for the first time, and could encourage to more research in this field. The replication in this project is possible due to the high precision and accuracy in the procedure, and makes a replication possible.

The research on MSE indicates that descriptive or cross-sectional design is mostly used when investigating the effect of entering these types of events. With a wider interest in explanation and to get a deeper understanding in this theme quasi-experiment was chosen for this project. The deeper understanding is found in some of the variables, but also a lot of questions remain. It was found a deeper understanding to the motivation towards participating in a MSE among the first time participants, in addition to more on whom these participants are. The effect on different health indicators is also presented, and in the relation to motivational factors. However, the deeper understanding is still missing. Both in terms of which changes that influence the health indicators, as well as more in the depth on motivational drive for more regular exercise among the participants, and what recognize these participants from those who do not participate in this type of events.

7.2 Strengths and limitations

In this chapter the strengths and limitations in this project will be discussed. The instruments used when measuring health indicators are valid, and the instruments are considered giving accurate results. This strengthens this project, as the health indicators are measured with valid instruments, instead of only self-reported health questionnaires. The instrument used, or similar instruments, are often used in large studies to investigate health or exercise in similar studies (Anderssen et al., 2010). The REMM questionnaire is valid, and is repeatedly used in pervious studies. The results from the REMM questionnaire also indicate similar results as in previous research. The small sample is presented as a limitation in this study, but it also made it possible to collect more data, and data regarding health, motivation and social background,

which also strengthen this project. This data collection made it possible to reach a deeper level of understanding. Also the connection with Birken, as the organizer of the specific MSE investigated in this project, made it possible to gain information regarding the marked surveys, as well as being able to contact the potential participants in this project. Presenting the strength in this project three of the questionnaires had closed questions; the questionnaire on motivation for exercise, REMM, motivational reasons for participating in the MSE Birkebeinerrenet, and self-reported health, SF-12v2. Bryman (2008) presents that using closed questions makes is easy to process the answers; closed questions enhance the comparability of the answers, they may clarify the meaning of a question for respondents. Also, they are easy for respondents to complete (Bryman, 2008). The limitation of using closed question is by Bryman (2008) described as close questions might make it difficult for the participants to make forced-choice answers mutually exclusive, and there may be variation among respondents in the interpretation of forced-choice answers. The 8-item questionnaire modified from the REMM consists of one item per sub-dimension to represent extensively the contents of the sub-dimensions. As Aaltonen et al. (2014) describe this may have consequences for the validity and reliability of the measure.

The major limitation in this project is the sample. The small sample makes it not possible go generalize, only to emphasis and support earlier research and to make some indications and suggestions regarding further research. The sample size were 9 in the 14-week before the event test, which was reduced to 8 in the 1-week before the event test. When analysing the results a stem and leaf plot was used to examine the normal distribution. The stem and leaf emphasised that the sample was not widespread. It also indicates an approximately normal distribution in the health indicators. The repeated measurements of the physical fitness measurements, presented as health indicators, may also contribute to an uncertainty related to the results. Buckworth et al. (2013, p. 391) emphasis that “test results can be motivating when people compare their results to healthy norms or their own previous results.” The physical fitness measurements may contribute to a motivational factor for improving the results. In addition, there may be a learning effect associated to the maximal oxygen uptake test. The 14-week before the event test may give a learning value that may influence the result in the 1-week before the event test. The specific choice of MSE might also be seen as a limitation in this project. The organizer of Birkebeinerrennet offers, in addition to that specific event, other event, which might focus more on the opportunity to involve individuals with a low level of PA. Also, investigating events offered by this specific organizer, and not

other events with a wider focus on PA, and not exercise and sport, could be seen as a limitation in this project. It was also a desire to include the background information from the marked survey on all first time participants in Birkebeinerrennet 2015. This to investigate and give a better explanation on who the first time participants in this MSE are. This could also have given a further explanation on the participants in this project being similar with the first time participants in this MSE, and not only similar with the average participant. This background information was not possible to access.

7.3 Discussion of the main findings

7.3.1 The sample of first time participants in the MSE Birkebeinerrennet 2015

In general, there was a similar distribution in this project as in earlier studies on participants in MSE and Birkebeinerrennet. In the marked survey on Birkebeinerrennet 2015 a total of 80 % were males (Bruland & Eide, 2015). This was similar with the gender distribution in 2010, 2012, and 2013 with a total of 73,9 %, 80 %, and 81 % male participants (Birken, 2010; Bruland & Eide, 2012, 2013). Bowles et al. (2006) presented a total of 72 % males in his sample on a different MSE. In this project the distribution was a total of 62,5 % males, and 37,5 % females. The small sample may contribute to the higher percentage of females in this project.

In previous studies there was a higher percentage of participants with a higher education than among the average population. In the marked survey on the participants in Birkebeinerrennet 2010, a total of 77 % had a higher education (Birken, 2010) The data from the marked survey on Birkebeinerrennet 2015 present 75 % of the participants had a higher education (Bruland & Eide, 2015). In this project a total of 66,7 % had a higher education, compered to the average population were 27,4 % of males, and 33,3 % of females is found to have a higher education (Statistisk Sentralbyrå, 2014). The income among the participants in this project did not accordance with pervious studies on participants in Birkebeinerrennet. The low numbers of participants in this project may explain these findings.

The Norwegian Institute of Public Health emphasises that the improvement in health has been greater among those with higher education and high income, than among those with lower education and lower income, and there is an enormous potential for improving the populations health by reducing the health inequalities (Nasjonalt Folkehelseinstitutt, 2010; Øverby et al., 2011). The MSE seems to be an arena that maintains these inequalities. This project emphasise what could be seen as a particular challenging MSE that might explain the high percentage of males. This challenging MSE might also explain why it is a large percentage of participants with a high education, as those with a high level of education are expected to have better health. This specific MSE might therefore not be seen as an arena that engages a large variety of the population.

7.3.2 Motivational drive and health benefit from participating in a mass sport event for the first time

Mass sport event and motivational drive

Aaltonen et al. (2014) presented in the literature review that among physically active the main motivation for PA was, among other, related to mastery, physical fitness and enjoyment. The findings by Aaltonen et al. (2014) is inline with this project which present mastery, physical fitness and enjoyment are three out of four of the highest ranked motivational reasons for exercise in this project. Aaltonen et al. (2014) also suggest that intrinsic motivation is associated with consistent leisure-time physical activity. The results on the health indicators in this project present both in the 14-week before the event tests, and the 1-week before the event tests, that the participants are consistent PA. Even though this project does not investigate lifestyle habits, the health indicators present a high level of PA and exercise among the sample. These findings emphasise the importance of focusing on motivational drive, and more specific, mastery, physical fitness and enjoyment in the use of MSE to promote PA and exercise. As this project and Aaltonen et al. (2014) present similar results on the motivational drive for participating in MSE, emphasising mastery, physical fitness and enjoyment which indicate an increased level of PA and exercise, this stand out as important areas for further investigation. Additionally, the potential positive outcome is presented in this project with an improvement in health indicators.

The findings regarding motivation for exercise also indicate that the two intrinsic motivational factors, mastery and enjoyment, are important among the first time participants in MSE studied in this project. The sample reported a high intrinsic motivation for exercise. This was expected in beforehand since Kilpatrick et al. (2005) found that participants in sport were more likely to report intrinsic motivation, than participants in exercise. Focusing on SDT this indicate that the participants engage in these activates for the pleasure and satisfaction inherent in the activity (Deci & Ryan, 2002). This might be described by Deci and Ryan (2002) tripartite taxonomy of intrinsic motivation. First, they are taking part in a MSE because of the pleasure and satisfaction derived from learning, exploring, and understanding new things. Second, they are taking part in a MSE to engage in activities because of the pleasure and satisfaction derived from trying to surpass oneself, creating, or accomplishing something. Third, they are taking part in a MSE to experience stimulation operates because it is associated with stimulating sensations. The discussion in the pervious paragraph, emphasise the importance of focusing on the motivational drive for participating in exercise, and investigating the level of intrinsic motivation among participants in MSE is found to be particular important. To come to a better understanding on the motivational drive for exercise among the participants in MSE further research on the intrinsic motivational drive is necessary. As presented, participants in sport were more likely to report intrinsic motivation than participants in exercise. This is important in this project as the questionnaire-concerned exercise, but the sample was participants in a MSE. Further research might consider distinguishing these two categories when presenting the possible potential in using MSE as a health-promoting arena, focusing more on sport then exercise.

Physical fitness had a high score, as a motivational factor for exercise, suggest that physical fitness is important for the participants, and the interpretation will be discussed later combined with the results from the motivational factors for participating in a MSE, and more specific goal setting and personal challenge. The high scores on physical fitness might be a result of the specific sample in this project. Physical fitness tests was presented in the invitation to the participants in this project, and those with an interested in, and those who uses physical fitness as a motivational faxctor might be seen as those who wanted to participate in this project. Deci and Ryan (2008b) argues that autonomous motivation tends to provide greater psychological health. This is also presented in this project as the participants have high scores on the SF-12vs, self-reported health, and as they report the psychological aspect as an important motivational factor.

Motivational factors for participating in this MSE presented exercise goal, and personal challenge with the highest ranking. All of the participants in this project reported exercise goal as a motivational drive for participating in the MSE, and seven of the participants reported personal challenge as a motivational factor for participating in the MSE. In the marked survey carried out among participants in Birkebeinerrennt in 2012 and 2013 89 % and 85 % reported that Birkebeinerrennet was a motivating exercise goal (Bruland & Eide, 2012, 2013). In the marked survey in 2015 a total of 85 % reported that Birkebeinerrennet was a motivating exercise goal (Bruland & Eide, 2015). This indicates that the high percentage of participants, in this project, who regards Birkebeinerrennet a motivation exercise goal is not only linked to this specific sample, but this is also found by Bruland and Eide (2012) and Bruland and Eide (2015).

As presented in the theoretical framework, goal setting is seen to be an effective strategy for supporting exercise behaviour change, and goal setting is found to be general effective in increasing PA among adults (Shilts et al., 2004). Kyllo and Landers (1995) presented the characteristics of goals that enhance exercise behaviour. The characteristics by Kyllo and Landers (1995) are among other identified as: specific, measurable, challenging, and addresses physiological factors (e.g., health, fitness). These characteristics may describe Birkebeienerrennet as a goal, since Birkebeinerrennet is a specific event, it is a measure of the time and result, it is a long distance race and for that reason in general opinion seen as challenging. Furthermore, setting this specific event as a goal can be seen with physiological factors as a measure of health, or fitness. This supports the findings that physical fitness is identified as one of the most motivational reasons for exercise among the participants. Due to the high report of Birkebeinerrennet as an exercise goal, it would be interesting to investigate what makes this event so “fitted” for being an exercise goal. Since the characteristics in goal setting is described it would also be interesting to see if this is the case among participants in Birkebeienerrennet and other MSE. Rogers (2000) emphasis this by saying a better understanding of peoples exercise goal is necessary. However, the characteristic among goal setting as challenging, and this particular MSE, do not support Lane et al. (2010) saying that MSE might have a health benefit as they foster low intensity participation in a non competitive, fun environment. The argument by Lane et al. (2010) might be seen as the contrast for goal setting, and may therefore be more representative in other types of MSE, and among participants in different MSE. It is important do distinguish between different

types of MSE in further research, and separate MSE which foster low intensity participation in a non competitive, fun environment as presented by Lane et al. (2010) on the one hand, and MSE with a more competitive focus, with a emphasis on goal setting and personal challenge as seen in Birkebeinerrennet, on the other. A better understanding of different types of MSE could present which type of MSE is found most suitable to be a health-promoting arena.

Personal challenge, as a motivational factor for participating in Birkebeinerrennet, was reported in he marked surveys on Birkebeinerrennet from 2012 and 2013 by 36 % and 34 % (Bruland & Eide, 2012, 2013). In the marked survey among the participants in Birkebeinerrennet 2015 a total of 20 % reported personal challenge was a motivational factor for participating (Bruland & Eide, 2015). 7 out of 8 in the sample in this project reported personal challenge as a motivational factor for participating in this MSE. This indicate that the sample in this project are more interested in a personal challenge, and therefore also be interested in taking part in this project due to the physical fitness test, as the physical fitness tests may be seen as a personal challenge.

As presented in the result chapter several associations were found, and mastery, as a motivational factor for exercise, correlated with body fat, and health, as a motivational factor for exercise, correlated with $\dot{V}o_{2\ max}$, is seen as the most interesting findings. The correlation between health and $\dot{V}o_{2\ max}$ is found to be negative. Investigating the results closer the participant with no improvement, and the participant with the lowest improvement in $\dot{V}o_{2\ max}$, is the two reporting health as a motivational factor for exercise. In contrast, mastery, as a motivational factor for exercise, correlated with body fat, was positive. This argues that mastery is a stronger motivational factor for exercise than health, and again presenting the importance of focusing on the intrinsic motivational drive. However, the results also present the two participants reporting health as a motivational factor for exercise to be among the highest results in $\dot{V}o_{2\ max}$ in the 14-week before the event test, suggesting health, as a motivational drive for exercise, present a enduring exercise behaviour, not influenced as much by the participation in a MSE.

The findings on motivational factors may suggest that participants in MSE have the MSE as an exercise goal, and see the MSE as a personal challenge, but they also need the intrinsic motivation for exercise and sport participating. As presented, an exercise goal is found to be general effective in increasing PA among adults, and participants in sport and MSE are more likely to report intrinsic motivation, and therefore be associated with consistent leisure-time PA. This suggests that an exercise goal, a personal challenge, and the intrinsic motivation provide a motivational drive among MSE participants for more regular exercise.

Mass sport event and improvement in health

Carlsson et al. (2007) discuss whether the participants in MSE can expect to live longer as a result of positive lifestyle habits as training over a longer period of time, dietary habits or smoking habits. The results in this project suggest that participants in MSE have several positive lifestyle habits due to the good results in the health indicators in the 14-week before the event tests. This was, as mentioned, expected because the sample in this project consisted of a high percentage of participants with a high education, which is associated with good health (Folkehelseinstituttet, 2008b). The statistical significant change in two of the health indicators, from the 14-week before the event test to the 1-week before the event test, is an indication of changes in lifestyle in this period of time, and possible a effect of entering this MSE. This project did not investigate exercise habits, or other lifestyle factors, and may therefor not suggest an answer to Carlsson et al. (2007) discussion on why participants in MSE live longer. The high scores found on the health indicators suggest positive lifestyle habits among MSE participants in this project in the 14-week before the event test, with a statistic significant change in two of the health indicators suggesting even more positive lifestyle habits in the 1-week before the event test. However, this project did not present an explanation to why the participants in MSE live longer, other than supporting studies on their good health, and that the participants in general seems to have good lifestyle habits.

The statistical significant changes found in $\dot{V}o_{2max}$ and body fat indicates entering a MSE, and with the motivational drive that entails, can lead to improvement in health. However, the sample in this project is to small to generalize these results, as expressed in the strengths and limitation chapter. The results from Cohen´s d indicated a medium change on visceral fat area. The result from the paired sample t-test indicates the visceral fat area to be close to a

statistic significant change, which explains the results on Cohen´s d. Clearly, the results from this project indicate MSE provide a motivational drive which lead to some improvement in health-indicators.

The additional questionnaire regarding the participant's own opinion on the effect of entering Birkebeinerrennet, six out of eight reported that they thought their participation in Birkebeinerrennet had lead them to be more physical active, and resulted in more healthy habits. This suggests the participants being aware of the changes they carried out, and these changes being a conscious choice. The written comments present positive experiences in the preparations before this event, also the participants emphasise the "chase" of getting enough training, and the goal setting is once again mentioned as a motivational part. Among the participants who did not answered that their participation in Birkebeinerrennet lead them to be more PA, and resulted in more healthy habits, it suggest they are already active with other sports, just taking another challenge or setting an other goal.

The health indicators WHR, $\dot{V}o_{2\ max}$ and blood pressure according to recommendations

The results among the participants in this project will now be presented and discussed, according to recommendations given by the different sources World Health Organization (2011) on WHR, Cooper and Storer (2001) on maximal oxygen uptake and Henriksson et al. (2009) on blood pressure. The recommendations for WHR for males are as mentioned $\leq$ 0,90 cm, and for females $\leq$ 0,85 cm (World Health Organization, 2011). There were 3 males in this project who were $\leq$ 0,90 cm at the 14-weeks before the event test with WHR. One male was above the recommendations at the 1-week before the event test. Among the females, there were one female who was above the WHR recommendations at the 14-weeks before the event test. None of the female participants was above in the 1-week before the event test. This suggest the participants changed some habits that influenced the WHR from the 14-week before the event test to the 1-week before the event test, even though there is no statistic significant change in this variable. The results present that the participants are close to consistent to the recommendations. However, it would be interesting to further investigate which changes the participants do in association with lifestyle habits from the 14-week before

test to the 1-week before the event test that contribute to this small, but value changes. Exploring a larger sample might indicate a more obvious change in this health-indicator.

The recommendations for maximal oxygen uptake are presented in the methodology chapter as fitness categories for both males and females. As mentioned there is an overlap in these categories, since three studies were used making these fitness categories. The categories composed by Cooper and Storer (2001) present all the participants in this project in the category high in $\dot{V}O_{2\ max}$ at the 14-weeks before the event test. In the results from the 1-week before the event test there were only one of the participants who did not increase $\dot{V}O_{2\ max.}$ This participant is still in the 1-week before the event test at the level high in his category. This emphasise that all of the participants were categorised as high in $\dot{V}O_{2\ max}$ in both the 1-week before the event test, as in the 14-weeks before the even test. This support the research by Carlsson et al. (2007) that the participants with a low level of PA may abstain from participants in similar MSE, especially seen among the participants in this project. This is also inline with the pervious presented results, suggesting MSE participants are healthy with positive lifestyle habit.

The Norwegian Directorate of health impart recommendations for blood pressure, presented in categories, as described in the methodology chapter (Henriksson et al., 2009). Using these categories on the results from the 14-weeks before the event test, one of the participants had an optimal systolic blood pressure, three had a normal systolic blood pressure, three had a normal high systolic blood pressure, and one had first extent of mild hypertension. Presenting the results from the diastolic blood pressure, four participants had an optimal blood pressure, one had a normal diastolic blood pressure, one had a normal high diastolic blood pressure, and two had first extent of mild hypertension diastolic blood pressure.

The results from the 1-week before the event test using the same categories presented three participants with an optimal systolic blood pressure, one had a normal systolic blood pressure, three had a normal high systolic blood pressure, and one had first extent of mild hypertension systolic blood pressure. The diastolic blood pressure indicates that four of the participants had an optimal diastolic blood pressure, two had a normal diastolic blood pressure, and two had a normal high diastolic blood pressure. This indicates no change in the

numbers of participants how was categorised with a normal systolic blood pressure from the 14-week before the event test to the 1-week before the event test. However, six participants were categorised with a normal diastolic blood pressure in the 14-week before the event test, compared with eight participants in the in the 1-week before the event test. This could indicate small changes, but as presented, there were no statistic significant change between the 14-week before the event test, and 1-week before the event test, in systolic and diastolic blood pressure.

7.3.3 Mass sport events potental to involve individuals with a low level of physical activity

As presented in this project the already "healthy" in the population is taking part in this type of events, and it seems as the event it self is not the cause of their good health. Murphy and Bauman (2007), and Bowles et al. (2006) indicate MSE can engage inactive to become active. The results from this project on the statistic significant change in $\dot{V}o_{2\ max}$ and body fat indicate some lifestyle changes, and may indicate more regular exercise. However, the findings in this project on health indicators emphasis the participants already exercising in the period before the 14-weeks before the event tests, and may therefor not be seen as going from inactive to active. Since this project does not investigate lifestyle habits this is based on the results from the health indicators. Due to these findings this project is not consistent with Murphy and Bauman (2007), and Bowles et al. (2006), and the results among the sample in this project do not support Birkebeinerrennet, as a specific MSE, to engage inactive to become active.

As presented, the participants in this project had good results at the different health indicators in both the 14-weeks before tests and the 1-week before tests. Presenting MSE as a health-promoting arena the wish would be to engage those with a low level of PA. Carlsson et al. (2007) emphasis that those with a low level of PA may abstain from participating and this is also seen in this project. Exploring the second research question the involvement of individuals with a low level of PA is not found so far in the presented research on MSE. Even thought the effect of reaching those with a low level of PA is not found in the mentioned studies, Bowles et al. (2006) emphasis the participants in the cycling MSE investigated, with a pre-event cycling ability, reported a higher average of bicycling rides the month after the event, than the month before the event. This supports the potential of increasing the level of

PA among those with a low level of PA. The motivational drive for regular exercise behaviour discussed in the previous chapter might present a better understanding of the initiative needed to involve individuals with a low level of PA.

The social model of health by Dahlgren and Whitehead (1991) may give a contribution to the understanding of the challenge of reaching those with a low level of PA. Earle et al. (2007) emphasise, as mentioned in the theoretical framework, that the key factors that influence health are biology and genetics, lifestyle and behaviour, living and working conditions, social and community networks, and the wider social conditions in which individuals are located. Even though the social model of health by Dahlgren and Whitehead (1991) do not present it, Earle et al. (2007) emphasis there is a potential for layer-to-layer interaction. As presented in the model, income and education may influence the individual lifestyle factors, as presented by other studies (Folkehelseinstituttet, 2008a, 2008b). The social model of health might therefore give an expiation of the high percentage of participants in the MSE Birkebeinerrennet with high education and high income, as a result of good individual lifestyle factor. Investigating the challenge of including the individuals with a low level of PA might be seen in the outer in the social model of health, in the layer regarding political changes and social structures. As emphasised by Murphy and Bauman (2007) the health sector has generally failed to engage with the opportunities provided by MSE to market the physical activity message. Further research exploring MSE, political authorities emphasising MSE potential, and the MSE organizers willingness to reach the possible potential might contribute to present MSE as a health-promoting arena, and as an arena to involve individuals with a low level of PA.

8. Conclusion

This project is based on research that emphasis the possible impact MSE has on the physical activity behaviour of the population, and the potential population reach of MSE. The particular MSE investigated in this project is Birkebeinerrennet 2015, the research sample consists of first time participants, and the total sample was 8. It was two test periods of physical fitness, one in the peride 14-weeks before the event, and the other 1-week before the event. Information on the social distribution was conducted, the participants completed questionnaires regarding motivational factors for exercising, self-reported health questionnaire, the motivational factors for participating in this MSE, and if, according to their own opinion entering this MSE had contributed to any changes in lifestyle habits. The physical measurements conducted were blood pressure, body composition; weight, muscle mass, body fat, visceral area fat and WHR, and $\dot{V}o_{2\ max}$ test.

The sample in this project presented a similar social distribution as earlier studies on participants in Birkebeinerrennet, and MSE. The self-reported health indicated that the participants consider their own health as better than the general population, both at the physical health scores, and the mental health scores. The results on the motivational factors for exercise presented the highest scores on mastery, physical fitness, psychological and enjoyment. On the motivational factors for participating in th MSE Birkebeinerrennet, exercise goal and personal challenge were given the highest scores. The physical fitness test presented a statistically significant change in the health indicators $\dot{V}o_{2\ max}$ and body fat, but there was no statistic significant change in the other heath indicators. Six out of eight participants reported that entering this MSE had contributed to changes in lifestyle habits, and the comments emphasised the focus on exercise goal and personal challenge.The results in this project indicate the participants in this MSE being intrinsically motivated for exercise. The participants had high scores in the health indicators, and this project do not support earlier findings that MSE could encourage inactive to become active, since the participants health indicators in this project suggest they are already active. However, the similar results may also be found among inactive taking part in a MSE.

The challenge in using MSE is presented as involving individuals with a low level of PA. More research exploring MSE, political authorities emphasising MSE potential, and the MSE organizers willingness to reach the possible potential is speculated to contribute to reaching the presented potential in MSE.

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Appendices

Appendix 1: Reqruit questionnaire, in Norwegin and in English

1. **Kjønn**
   - ☐Mann
   - ☐Kvinne

2. **Alder**
   - ☐16 - 19 år
   - ☐20 – 29 år
   - ☐30 – 39 år
   - ☐40-49 år
   - ☐50-59 år
   - ☐60 – 69 år
   - ☐70 – 79 år
   - ☐80 – 100 år

3. **Hvilket fylke bor du i?**
   - ☐Akershus
   - ☐Aust – Agder
   - ☐Buskerud
   - ☐Finnmark
   - ☐Hedmark
   - ☐Hordaland
   - ☐Møre og Romsdal
   - ☐Nordland
   - ☐Nord – Trøndelag
   - ☐Oppland
   - ☐Rogaland
   - ☐Sogn og Fjordane
   - ☐Sør – Trøndelag
   - ☐Telemark

☐Troms

☐Vest – Agder

☐Vestfold

☐Østfold

☐Not from Norway

4. **Hva er din høyeste utdanning?**

☐Grunnskole

☐Videregående skole

☐Høyere utdanning

5. **Hva er din samlede inntekt?**

☐Under 150.000

☐150.000 – 300.000

☐300.000 – 450.000

☐450.000 – 600.000

☐Mer enn 600.000

6. **Har du tidligere deltatt i et større idrettsarrangement?**

(For eksempel: Marcialonga, Vasaloppet, Marathon, half-maraton, etc.)

☐Ja

☐Nei

☐Usikker

Er du interessert i å delta i fysiske tester som $\dot{V}O_{2\ max}$ test, InBody720 (kroppssammensetning) og blodtrykk som sier mye om din helse? Testene vil bli gjennomført på Høgskolen i Hedmark, i Elverum.

☐Ja

☐Nei

7. **Er du interessert i å delta i dette prosjektet vennligst skriv inn din e-post adresse:**

Reqruit questionnaire, in English

1. **Sex**
   - ☐Male
   - ☐Female

2. **Age**
   - ☐16 - 19 years old
   - ☐20 – 29 years old
   - ☐30 – 39 years old
   - ☐40-49 years old
   - ☐50-59 years old
   - ☐60 – 69 years old
   - ☐70 – 79 years old
   - ☐80 – 100 years old

3. **Which county do you live in?**
   - ☐Akershus
   - ☐Aust – Agder
   - ☐Buskerud
   - ☐Finnmark
   - ☐Hedmark
   - ☐Hordaland
   - ☐Møre og Romsdal
   - ☐Nordland
   - ☐Nord – Trøndelag
   - ☐Oppland
   - ☐Rogaland

☐Sogn og Fjordane

☐Sør – Trøndelag

☐Telemark

☐Troms

☐Vest – Agder

☐Vestfold

☐Østfold

☐Not from Norway

4. **What is your highest education?**

☐Primary school

☐High School

☐Collage

5. **What is your income?**

☐Below 150.000

☐150.000 – 300.000

☐300.000 – 450.000

☐450.000 – 600.000

☐More than 600.000

6. **Have you competed in a mass sport competition earlier?**

(For example: Marcialonga, Vasaloppet, Marathon, half-maraton, etc.)

☐Yes

☐No

☐Not sure

Are you interested in participation in physical tests; $\dot{V}o_{2\ max}$ test, InBody720 (body composition) and blood pressure that indicate you health? The tests will be conducted at University Collage of Hedmark, in Elverum.

☐Yes

☐No

7. **If you are interested in participating in this project please type in your e-mail address:**

Appendix 2: SF12v2, in Norwegian

SF-12v2

Din helse og trivsel

Dette spørreskjemaet handler om hvordan du ser på din egen helse. Disse opplysningene vil hjelpe oss til å få vite hvordan du har det og hvordan du er i stand til å utføre dine daglige gjøremål. ***Takk for at du fyller ut dette spørreskjemaet!***

For hvert av de følgende spørsmålene vennligst sett et ☒ i den ene luken som best beskriver ditt svar.

1. Stort sett, vil du si at din helse er:

Utmerket	Meget god	God	Nokså god	Dårlig
☐	☐	☐	☐	☐

2. De neste spørsmålene handler om aktiviteter som du kanskje utfører i løpet av en vanlig dag. Er din helse slik at den begrenser deg i utførelsen av disse aktivitetene nå? Hvis ja, hvor mye?

	Ja, begrenser meg mye	Ja, begrenser meg litt	Nei, begrenser meg ikke i det hele tatt
Moderate aktiviteter som å flytte et bord, støvsuge, gå en tur eller drive med hagearbeid	☐	☐	☐
Gå opp trappen flere etasjer	☐	☐	☐

3. I løpet av de siste 4 ukene, hvor ofte har du hatt noen av de følgende problemer i ditt arbeid eller i andre av dine daglige gjøremål på

	Hele tiden	Mye av tiden	En del av tiden	Litt av tiden	Ikke i det hele tatt
a. Du har utrettet mindre enn du hadde ønsket	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Du har vært hindret i å utføre visse typer arbeid eller gjøremål **grunn av din fysiske helse?**	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

4. I løpet av de siste 4 ukene, hvor ofte har du hatt noen av de følgende problemer i ditt arbeid eller i andre av dine daglige gjøremål på grunn av følelsesmessige problemer (som f.eks. å være deprimert eller engstelig)?

	Hele tiden	Mye av tiden	En del av tiden	Litt av tiden	Ikke i det hele tatt
a. Du har utrettet mindre enn du hadde ønsket	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Du har utført arbeidet eller andre gjøremål mindre grundig enn vanlig	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

5. I løpet av de siste 4 ukene, hvor mye har smerter påvirket ditt vanlige arbeid (gjelder både arbeid utenfor hjemmet og husarbeid)?

Ikke i det hele tatt	Litt	En del	Mye	Svært mye
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

6. **Disse spørsmålene handler om hvordan du har følt deg og hvordan du har hatt det de siste 4 ukene. For hvert spørsmål, vennligst velg det svaralternativet som best beskriver hvordan du har hatt det. Hvor ofte i løpet av de siste 4 ukene har du…**

	Hele tiden	Mye av tiden	En del av tiden	Litt av tiden	Ikke i det hele tatt
Følt deg rolig og harmonisk?	☐	☐	☐	☐	☐
Hatt mye overskudd?	☐	☐	☐	☐	☐
Følt deg nedfor og deprimert?	☐	☐	☐	☐	☐

7. **I løpet av de siste 4 ukene, hvor ofte har din fysiske helse eller følelsesmessige problemer påvirket din sosiale omgang (som det å besøke venner, slektninger osv.)?**

Hele tiden	Mye av tiden	En del av tiden	Litt av tiden	Ikke i det hele tatt
☐	☐	☐	☐	☐

Takk for at du fylte ut dette spørreskjemaet!

Appendix 3: REMM, questionnaire on motivational factors for exercising, in Norwegian and in English

REMM

Motivasjon: hva er dine motiver for å trene?

Ranger hver påstand på en skala fra 1 til 5, hvor 1 er sterkt uenig og 5 er helt enig.

---

a. Jeg ønsker å forbedre mine ferdigheter og bli bedre i en aktivitet

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

b. Jeg ønsker å være i god fysisk form

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

c. Jeg liker å være med venner og gjøre aktiviteter med andre

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

d. Jeg ønsker å forbedre den psykiske helsen min

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

e. Jeg ønsker å opprettholde/forbedre utseende og kroppsfasong

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

f. Jeg ønsker å innfri andres forventninger

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

g. Jeg liker å ha det gøy og jeg liker å trene

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

h. Jeg ønsker å være i god fysisk form og se bedre ut enn andre

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

Takk for at du fylte ut dette spørreskjemaet!

REMM, questionnaire on motivational factors for exercising, in English

REMM

Motivation: what are your motives for exercising?

Rank each statement on a scale from 1 to 5, 1 being strongly disagreeing and 5 being completely agreed.

---

a. I wish to improve my skills and/or get better in an activity

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

b. I wish to be physical fit

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

c. I like to be with friends and/or do activity with others

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

d. I wish to improve psychological health

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

e. I with to maintain/improve appearance and body shape

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

f. I wish to confirm to others expectations

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

g. I like to have a good time and I enjoy exercising

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

h. I wish to be fitter and/or look better than others

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

Thank you for filling out this questionnaire!

Appendix 4: Motivational factors for partcipating in Birkebeinerrennet 2015, in Norwegian and in English

Motiver for å delta i Birkebeinerrennet

Hva motiverer deg for å delta i Birkebeinerrennet?

☐Hensyn til egen helse

☐Det sosiale ved å delta (treffe andre)

☐Konkurransen

☐Birken som et treningsmål

☐Rennet er en del av trippelen

☐Sosialt press/støtte på arbeidsplassen

☐Sosialt press/støtte i vennekrets/idrettslag

☐Ønsket om å klare merke

☐Jeg ser rennet som en personlig styrkeprøve

☐Annet:

Basert på markedsundersøkelsene gjennomført i 2010, spørsmål 32: hva motiverer deg til å delta i Birkebeinerrennet, og markedsundersøkelsen i 2013, spørsmålet om : Hoveddrivkraften for å delta (Birken, 2010; Bruland & Eide, 2013).

Motivational factors for partcipating in Birkebeinerrennet 2015, in English

Motives for participating in Birkebeinerrennet

What motivates you to participate in Birkebeinerrennet?

☐Consideration to own health

☐The social aspect of participating (meeting others)

☐The competition

☐Birken as a motivating exercise goal

☐The race is a part of trippelen

☐Social pressure/support from my workplace

☐Social pressure/support among friends/ training team

☐The wish to achieve the mark

☐I see the race as a personal challenge of strength

☐Other:

Based on marked surveys completed in 2010, question 32: “what motivates you to participate in Birkebeinerrennet” and marked survey 2013, question regarding: leading motive power for participating (Birken, 2010; Bruland & Eide, 2013).

Appendix 5: Own opinion on the changes in lifestyle from participating in Birkebeinerrennet, in Norwegian and in English

Tilleggsspørsmål

Tror du din deltakelse i Birkebeinerrennet har ført til at du er mer aktiv og har flere sunne vaner?

☐Ja

☐Nei

Skriv her hvis det er noe du ønsker å utype:

Own opinion on the changes in lifestyle from participating in Birkebeinerrennet, in English

Supplementary question

Do you believe you participation in Birkebeinerrennet has lead you to be more physical active and have more health habits?

☐Yes

☐No

Write her if is anything you would like to elaborate:

Appendix 6: Protocall, 14-weeks before the event test, in Norwegian and in English

TEST PROTOKOLL

- Ønske velkommen
- Generell informasjon om prosjektet og gi lese over og signere samtykke
- Informere om tester som skal gjennomføres i riktig rekkefølge: REMM motivasjon for trening, SF-12v2 selvopplevd helse, blodtrykk, InBody720 kroppssammensetning, $\dot{V}o_{2\ maks}$ test utholdenhet

- Gi informasjon, informere om at de kan spørre om noe er uklart, og gjennomføre spørreskjema for REMM, motivasjon for trening,
- Gi informasjon, informere om at de kan spørre om noe er uklart, og gjennomføre spørreskjema for SF-12v2 selvopplevd helse

Måle Blodtrykk:

- sitte fem minutter i ro
- legger cuffen (mansjetten) rundt høyre overarm (etter at skjorten er godt brettet opp, helst kun t-skjorte eller lignende), strammer lett til og fester den med borrelåsen. Mansjettens nedre kant legges ca 2-3 cm ovenfor albuegropen. (Klær skal ikke stramme på overarmen).
- lar ledningen fra cuffen vende nedover på innsiden av overarmen og ligge på innsiden av underarmen
- sitter i ro under testing med avslappet ”testarm”
- trykker på start/stopp-knappen
- leser av blodtrykkene og pulsen fra blodtrykkapparatets skjerm
- tre måling hvor alle målinger registreres, hvor gjennomsnittet av de to siste skal brukes
- måles med ett minutt mellom hver måling
- Ved tilfeller med blodtrykk over 180/110 mmHg vil det ikke bli gjennomført test av maksimalt oksygen opptak (ACSM's Guidelines for Exercise Testing and Prescription og KAN-1).

Test ID:	Blodtrykk	Puls
Måling nr. 1		
Måling nr. 2		
Måling nr. 3		

WHO:

Ideelt normalt blodtrykk for en frisk person	**120/80**
Mildt forhøyet blodtrykk	**140/90**
Moderat forhøyet blodtrykk	**160/100**
Alvorlig forhøyet blodtrykk	**180/110**

Tilfeller over 180/110 vil det ikke gjennomføres test av maksimalt oksygenopptak.

Gjennomføre InBody720:

- gå på toalettet
- stå oppreist i fem minutter så gjennomføres test
- Testpersonen gjennomfører målingen barbeint og lett bekledning (gjerne tette klesplagg). Innhold fra lommer, inkludert klokke og smykker fjernes
- Plasser føttene nøyaktig på elektrodene formet som fotavtrykk.
- En vektmåling blir først gjennomført. Denne tar hensyn til lett bekledning og trekker fra 0,5 kg på vekten. Stå stille og ikke hold i håndtakene.
- Deretter plotter testpersonell inn ID (tlf.nr), alder, høyde og kjønn. Bruk piltastene.

- Ved ferdig utfylt informasjon tar testperson tak i håndtakene og plasserer tommelen på oversiden av håndgrepet mens innsiden av håndflaten og de fire fingre dekker nederst elektrode på håndtaket.
- Testpersonen skal holde armene skrått ut fra kroppen gjennom analysen (ca. 10/15 grader), holde et fast grep rundt håndtaket, men samtidig passe på og ikke stramme muskulaturen.
- Testpersonell trykker på «Enter» når utgangsposisjon er korrekt.
- Målingen tar ca. 2 min. Testpersonen skal stå rolig og ikke snakke under test.

Test $\dot{V}o_2$ maks

- en samtale med testperson ang. testprosedyre. Trappetest vil bli benyttet hos deltakerne. Dette vil si at belastningen økes ved fastsatte tidspunkter og med faste belastningstrinn.
- Informere om testen, oppvarming, startfart og helling
- **Forklare viktigheten av å holde på til utmattelse!**
- En god og variert oppvarming, varighet 20 minutter. 5 min tilpassing på mølla valgfri fart (ikke over 5,3 % helling og 7 eller 8 km/t), 15 min oppvarming på en helling og fart som ikke er over start på testen
- **Siste belastningstrinn skal holdes i minimum ett minutt, dette gjøres kjent for testpersonen før testen starter**
- Testpersonen vil underveis i testen sekunderes i forhold til målte verdier og presses til utmattelse
- Hvis det ikke er unntak (kan ikke løpe) blir protokollen satt til en helling på 5,3 % på begge kjønn, med en startfart på 7 km/t på kvinner og 8 km/t på menn. Dette for å få en mest mulig lik test begge ganger.

Kriterier for $\dot{V}o_{2\ maks}$ vil bli bestemt av to ulike faktorer: blod laktatkonsentrasjon i blodet ut fra alder; $\geq$ 7,0 kvinner mellom 20-49 og $\geq$ 9,0 for menn i samme aldergruppe, $\geq$ 5,0 for

kvinner 50-64 år, ≥ 6,0 for menn i samme aldersgruppe, og ≥ 3,5 for de over 65 gjelder begge kjønn. Respiratory exchange ratio vil og være aldersbestemt. ≥ 1,10 for kvinner og menn mellom 20-49 år, ≥1,05 for kvinner og menn mellom 50-64 år, og ≥ 1,0 for kvinner og menn over (≥) 65 år. I tillegg vil plateau bli sett på som et kriteria for at maksimalt oksygenopptak er oppnådd. < 150 ml/min økning over et minutt eller < 2 ml/min/kg økning vil bli sett på som plateau.

- Etter endt test vil det bli gitt en gjennomgang av alle testresultatene

Protocall, 14-weeks before the event test, in English

TEST PROTOCOL

- Greet them welcome
- General information about the project, and give them the consent to read and sign
- Information about the tests, in the right order: REMM motivational factors for exercise, SF-12v2 self-reported health, blood pressure, InBody720 body composition, $\dot{V}o_{2\,max}$ test of endurance

- Give information and inform them to ask questions if anything is unclear, and complete the questionnaires for REMM, motivation for exercise
- Give information and inform them to ask questions if anything is unclear, and complete the questionnaire for SF-12v2 self-reported health

Measuring blood pressure:

- Sitting still for five minutes
- Placing the cuff around the right upper arm (with the sweater rolled up, or preferable only wearing a t-shirt), tighten lightly and close it with the Velcro. The cuff is placed 2-3 cm above the elbow. Clothes should not be tight on the upper arm.
- The cable from the cuff is placed lying on the inside of the upper arm, pointing down
- Sitting still during the test, with a relaxed “test arm”
- Press the start/stop button
- Notes the blood pressure and pulse from the blood pressure aspartate

- Three measurements conducted, and all three is registries, the average of the last two measurements should be used
- The measurements is completed with one minutes between
- With a case of blood pressure above 180/110 mmHg it will not be conducted maximal oxygen uptake test

Test ID:	Blood pressure	Pulse
Measurement nr. 1		
Measurement nr. 2		
Measurement nr. 3		

WHO:

Ideal normal blood pressure for a healthy person **120/80**

Slightly elevated blood pressure **140/90**

Moderate elevated blood pressure **160/100**

Serious elevated blood pressure **180/110**

In cases with blood pressure above 180/110 mm Hg it will not be conducted a test of maximal oxygen uptake.

Completing InBody720:

- Go to the toilet
- Stand upright for five minutes before the test is completed
- The participant should complete the measurement barefoot and with light clothing (willingly tight clothing) The contents in the pockets are removed, including clocks and jewellery's
- Place the feet's precise on the electrodes shaped as foot prints

- A weight measurement is fist completed. This consider light clothing and withdraw 0,5 kg from the weight. The participants should stand still, and not hold the handles.
- Than the test responsible plot in ID (phone number), age, height, and age. Use the arrow key.
- When the information is added the participant grabs the handles and place the thumbs on the upper side of the handles, and the inside of the pale and the four fingers covers the lowest electrodes on the handle.
- The participant should hold the arms cross diagonally out from the body through the hole analysing (ca. 10/15 grades), hold the handles with a firm grip, but at the same time not tighten the musculature.
- The test responsible press "Enter" when the starting position is correct.
- The measurement takes approximately 2 minutes. The participants should stand still, and not speak.

Test of $\dot{V}o_{2\,max}$

- A conversation with the participant regarding test protocol. "Trappetest" will be used to complete the test, i.e. the strain increase by scheduled times and with scheduled load steps.

- Give information about the test, the warm up, starting speed and incline

- **Explain the importance of holding on until exhaustion!**

  A good and varied warm up with a durability of 20 minutes. 5 minutes adopting to the treadmill with optional speed and incline (not above 5,3 % incline, and 7 or 8 km/h), 15 minutes warm up on a speed and incline who is not above the starting speed and incline.

- **The last load step should be maintained in one minute, this is explained for the participant before the test begins.**
- The test participant will during the test be seconded regarding the measurements and will be pushed to exhaustion

- If there is no exception (is not possible to run) the protocol will be put at an incline of 5,3 % on both genders, with a staring speed at 7 km/h for the females, and 8 km/h for the males. This to achieve a similar test both times.

Criteria's for $\dot{V}O_{2\ max}$ will be decided by different factors: blood lactate concentration from age; ≥ 7,0 woman between 20-49 and ≥ 9,0 for men in the same age group, ≥ 5,0 for woman in the age 50-64 years, ≥ 6,0 for men in the same age group, and ≥ 3,5 for they above 65 goes for both genders. Respiratory exchange ratio will also be used according to age, ≥ 1,10 for woman and men between 20-49 years, ≥1,05 for woman and men 50-64 years, and ≥ 1,0 for woman and men above (≥) 65 years. In addition plateau will be used as a criteria for reaching maximal oxygen uptake. < 150 ml/min increase over one minute, or < 2 ml/min/kg will be used as a plateau.

- After finishing all test it will be given a examination of all the results

Appendix 7: Protocoll, 1-week before the event test, in Norwegian, and in English

TEST PROTOKOLL

- Ønske velkommen
- Informere om tester som skal gjennomføres i riktig rekkefølge: hoveddrivkraften for å delta i Birkebeinerrennet, blodtrykk, InBody720 kroppssammensetning, $\dot{V}O_{2\ maks}$ test utholdenhet, siste spørsmål om deltakelse i birken

- Gi informasjon, informere om at de kan spørre om noe er uklart, og gjennomføre spørreskjema for motivasjon for å delta i Birkebeinerrennet 2015 (Appendix 2)

Måle Blodtrykk:

- sitte fem minutter i ro
- legger cuffen (mansjetten) rundt høyre overarm (etter at skjorten er godt brettet opp, helst kun t-skjorte eller lignende), strammer lett til og fester den med borrelåsen.

Mansjettens nedre kant legges ca 2-3 cm ovenfor albuegropen. (Klær skal ikke stramme på overarmen).

- lar ledningen fra cuffen vende nedover på innsiden av overarmen og ligge på innsiden av underarmen
- sitter i ro under testing med avslappet ”testarm”
- trykker på start/stopp-knappen
- leser av blodtrykkene og pulsen fra blodtrykkapparatets skjerm
- tre måling hvor alle målinger registreres, hvor gjennomsnittet av de to siste skal brukes
- måles med ett minutt mellom hver måling
- Ved tilfeller med blodtrykk over 180/110 mmHg vil det ikke bli gjennomført test av maksimalt oksygen opptak (ACSM's Guidelines for Exercise Testing and Prescription og KAN-1).

Test ID:	Blodtrykk	Puls
Måling nr. 1		
Måling nr. 2		
Måling nr. 3		

WHO:

Ideelt normalt blodtrykk for en frisk person **120/80**

Mildt forhøyet blodtrykk **140/90**

Moderat forhøyet blodtrykk **160/100**

Alvorlig forhøyet blodtrykk **180/110**

Tilfeller over 180/110 vil det ikke gjennomføres test av maksimalt oksygenopptak.

Gjennomføre InBody720:

- gå på toalettet
- stå oppreist i fem minutter så gjennomføres test
- Testpersonen gjennomfører målingen barbeint og lett bekledning (gjerne tette klesplagg). Innhold fra lommer, inkludert klokke og smykker fjernes
- Plasser føttene nøyaktig på elektrodene formet som fotavtrykk.
- En vektmåling blir først gjennomført. Denne tar hensyn til lett bekledning og trekker fra 0,5 kg på vekten. Stå stille og ikke hold i håndtakene.
- Deretter plotter testpersonell inn ID (tlf.nr), alder, høyde og kjønn. Bruk piltastene.
- Ved ferdig utfylt informasjon tar testperson tak i håndtakene og plasserer tommelen på oversiden av håndgrepet mens innsiden av håndflaten og de fire fingre dekker nederst elektrode på håndtaket.
- Testpersonen skal holde armene skrått ut fra kroppen gjennom analysen (ca. 10/15 grader), holde et fast grep rundt håndtaket, men samtidig passe på og ikke stramme muskulaturen.
- Testpersonell trykker på «Enter» når utgangsposisjon er korrekt.
- Målingen tar ca. 2 min. Testpersonen skal stå rolig og ikke snakke under test.

Test $\dot{V}O_{2\ maks}$

- en samtale med testperson ang. testprosedyre. Trappetest vil bli benyttet hos deltakerne. Dette vil si at belastningen økes ved fastsatte tidspunkter og med faste belastningstrinn.

- Informere om testen, oppvarming, startfart og helling

- **Forklare viktigheten av å holde på til utmattelse!**

- En god og variert oppvarming, varighet 20 minutter. 5 min tilpassing på mølla valgfri fart (ikke over 5,3 % helling og 7 eller 8 km/t), 15 min oppvarming på en helling og fart som ikke er over start på testen
- **Siste belastningstrinn skal holdes i minimum ett minutt, dette gjøres kjent for testpersonen før testen starter**

- Testpersonen vil underveis i testen sekunderes i forhold til målte verdier og presses til utmattelse
- Hvis det ikke er unntak (kan ikke løpe) blir protokollen satt til en helling på 5,3 % på begge kjønn, med en startfart på 7 km/t på kvinner og 8 km/t på menn. Dette for å få en mest mulig lik test begge ganger.

Kriterier for $\dot{V}O_{2\ maks}$ vil bli bestemt av to ulike faktorer: blod laktatkonsentrasjon i blodet ut fra alder; $\geq$ 7,0 kvinner mellom 20-49 og $\geq$ 9,0 for menn i samme aldergruppe, $\geq$ 5,0 for kvinner 50-64 år, $\geq$ 6,0 for menn i samme aldersgruppe, og $\geq$ 3,5 for de over 65 gjelder begge kjønn. R (respiratory exchange ratio) vil og være aldersbestemt. $\geq$ 1,10 for kvinner og menn mellom 20-49 år, $\geq$1,05 for kvinner og menn mellom 50-64 år, og $\geq$ 1,0 for kvinner og menn over ($\geq$) 65 år. I tillegg vil plateau bli sett på som et kriteria for at maksimalt oksygenopptak er oppnådd. < 150 ml/min økning over et minutt eller < 2 ml/min/kg økning vil bli sett på som plateau.

- Gi informasjon, informere om at de kan spørre om noe er uklart, og gjennomføre spørreskjema for egen mening om effekten av å delta i Birkebeinerrennet

Protocoll, 1-week before the event test, in English

- Greet them welcome
- Information about the tests, in the right order: motivational factors for participating in Birkebeienerrennet, blood pressure, InBody720 body composition, $\dot{V}O_{2\ max}$ test of endurance, and last questionnaire on their own opinion on entering Birkebeinerrennet
- Give information and inform them to ask questions if anything is unclear, and complete the questionnaires for motivational factors for participating in Birkebeinerrennet

Measuring blood pressure:

- Sitting still for five minutes
- Placing the cuff around the right upper arm (with the sweater rolled up, or preferable only wearing a t-shirt), tighten lightly and close it with the Velcro. The cuff is placed 2-3 cm above the elbow. Clothes should not be tight on the upper arm.
- The cable from the cuff is placed lying on the inside of the upper arm, pointing down
- Sitting still during the test, with a relaxed "test arm"
- Press the start/stop button
- Note the blood pressure and pulse from the blood pressure aspartate
- Three measurements and all three is registries, and the average of the last two measurements should be used
- The measurements is completed with one minutes between
- With a case of blood pressure above 180/110 mmHg it will not be conducted maximal oxygen uptake test

Test ID:	Blood pressure	Pulse
Measurement nr. 1		
Measurement nr. 2		
Measurement nr. 3		

WHO:

Ideal normal blood pressure for a healthy person	**120/80**
Slightly elevated blood pressure	**140/90**
Moderate elevated blood pressure	**160/100**
Serious elevated blood pressure	**180/110**

In cases with blood pressure above 180/110 mm Hg it will not be conducted a test of maximal oxygen uptake.

Completing InBody720:

- Go to the toilet
- Stand upright for five minutes before the test is completed
- The participant should complete the measurement barefoot and with light clothing (willingly tight clothing) The contents in the pockets are removed, including clocks and jewellery's
- Place the feet's precise on the electrodes shaped as foot prints
- A weight measurement is fist completed. This consider light clothing and withdraw 0,5 kg from the weight. The participants should stand still, and not hold the handles.
- Then
- the test responsible plot in ID (phone number), age, height, and age. Use the arrow key.
- When the information is added the participant grabs the handles and place the thumbs on the upper side of the handles, and the inside of the pale and the four fingers covers the lowest electrodes on the handle.
- The participant should hold the arms cross diagonally out from the body through the hole analysing (ca. 10/15 grades), hold the handles with a firm grip, but at the same time not tighten the musculature.
- The test responsible press "Enter" when the starting position is correct.
- The measurement takes approximately 2 minutes. The participants should stand still, and not speak.

Test of $\dot{V}o_{2\,max}$

- A conversation with the participant regarding test protocol. "Trappetest" will be used to complete the test, i.e. the strain increase by scheduled times and with scheduled load steps.

- Give information about the test, the warm up, starting speed and incline

- **Explain the importance of holding on until exhaustion!**

  A good and varied warm up with a durability of 20 minutes. 5 minutes adopting to the treadmill with optional speed and incline (not above 5,3 % incline, and 7 or 8 km/h),

15 minutes warm up on a speed and incline who is not above the starting speed and incline.

- **The last load step should be maintained in one minute, this is explained for the participant before the test begins.**
- The test participant will during the test be seconded regarding the measurements and will be pushed to exhaustion
- If there is no exception (is not possible to run) the protocol will be put at a incline of 5,3 % on both genders, with a staring speed at 7 km/h for the females, and 8 km/h for the males. This to achieve a similar test both times.

Criteria's for $\dot{V}O_{2\ max}$ will be decided by different factors: blood lactate concentration from age; ≥ 7,0 woman between 20-49 and ≥ 9,0 for men in the same age group, ≥ 5,0 for woman in the age 50-64 years, ≥ 6,0 for men in the same age group, and ≥ 3,5 for they above 65 goes for both genders. Respiratory exchange ratio will also be used according to age, ≥ 1,10 for woman and men between 20-49 years, ≥1,05 for woman and men 50-64 years, and ≥ 1,0 for woman and men above (≥) 65 years. In addition plateau will be used as a criteria for reaching maximal oxygen uptake. < 150 ml/min increase over one minute, or < 2 ml/min/kg will be used as a plateau.

- Give information and inform them to ask questions if anything is unclear, and complete the questionnaires for their own opinion of the effect of entering Birkebeinerrennet (Appendix 5)

- After finishing all test it will be given a examination of all the results

Appendix 8: Written consent, in Norwegian and in English

Forespørsel om deltakelse i forskningsprosjektet

"Deltakelse i større idrettsrettet arrangement i et folkehelseperspektiv"

Bakgrunn og hensikt

Dette er et spørsmål til deg om å delta i en forskningsstudie for å se hvilken effekt deltakelse i et større idrettsarrangement for første gang har på ulike helseindikatorer i et folkehelseperspektiv. Du blir spurt om å være med på denne studien siden det er første gang du deltar på Birkebeinerrennet. Dette prosjektet er et mastergradsoppgave som gjennomføres ved Høgskolen i Hedmark.

Hva innebærer studien?

Det vil i denne studien bli gjennomført to testperioder. Den første er i slutten av november, den siste ukene før Birkebeinerrennet 2015. Testen vil bestå av en del med spørreundersøkelse, og en fysisk del som gjennomføres på Testlab Idrett, Høgskolen i Hedmark, Elverum. Det vil bli testet ulike helseindikatorer; blodtrykk, kroppssammensetning (Inbody720) og maksimalt oksygenopptak.

Mulige fordeler og ulemper

Du vil gjennom dette prosjektet få gjennomført to ulike testperioder. I hver av disse vil du få testet maksimalt oksygenopptak ($\dot{V}O_{2\ maks}$), InBody720 (kroppssammensetning) og blodtrykk.

Du vil og få en god gjennomgang av dine resultater og en kopi av disse med deg. Test av maksimalt oksygenopptak er en fysisk krevende test som skal gjennomføres til utmattelse.

Dette er en belastende og tung fysisk test. Test av InBody720 og blodtrykk er ikke fysisk krevende.

Hva skjer med testresultatene og informasjonen om deg? Informasjonen om deg og de ulike testene vil bli benyttet for å undersøke hvilken effekt deltakelse i et større idrettsarrangement har på ulike helseindikatorer.

Testresultatene tatt av deg og informasjonen som registreres om deg skal kun brukes slik som beskrevet i hensikten med studien. Alle opplysningene og prøvene vil bli behandlet uten navn og fødselsnummer eller andre direkte gjenkjennende opplysninger. En kode knytter deg til dine opplysninger og prøver gjennom en navneliste .

Det er kun autorisert personell knyttet til prosjektet som har adgang til navnelisten og som kan finne tilbake til deg.

Det vil ikke være mulig å identifisere deg i resultatene av studien når disse publiseres, og innsamlede opplysninger anonymiseres innen mai 2015.

Frivillig deltakelse

Det er frivillig å delta i studien. Du kan når som helst og uten å oppgi noen grunn trekke ditt samtykke til å delta i studien. Dersom du ønsker å delta, undertegner du samtykkeerklæringen på siste side. Om du nå sier ja til å delta, kan du senere trekke tilbake ditt samtykke uten at det påvirker din øvrige behandling. Dersom du senere ønsker å trekke deg eller har spørsmål til studien, kan du kontakte Ingeborg Lunde, telefonnummer 99279018, e-post ingeborglunde@hotmail.com

Ytterligere informasjon om studien finnes i kapittel *A* – *utdypende forklaring av hva studien innebærer.*

Samtykkeerklæring følger etter kapittel A og kapittel B.

Kapittel A- utdypende forklaring av hva studien innebærer

Kriterier for deltakelse

Det vil i dette prosjektet være førstegangs deltakere i Birkebeinerrennet 2015 som er utvalget. Det vil og være et kriteriet at du er villig til å komme til Høgskolen i Hedmark, Elverum for deltakelse i prosjektet.

Bakgrunnsinformasjon om studien

Dette prosjektet har til hensikt å se på deltakelse i et større idrettsarrangement som en effekt på folkehelsen. Det vil som nevnt over bli gjennomført tre ulike tester og i tillegg spørreskjema. En fysisk; test av maksimalt oksygenopptak. I tillegg test av InBody720, kroppssammensetning og blodtrykk.

Tidsskjema – hva skjer og når skjer det?

Disse testene vil bli gjennomført to ganger med et tidsrom på ca. fire måneder. Den første testrunden skal gjennomføres i tidsrommet 17. November 2014 til 28. November 2014. Den andre testrunden skal gjennomføres i tidsrommet 9. Mars 2015 til 19. Mars 2015. Det vil i disse to testperiodene bli gjennomført akkurat samme type tester med samme prosedyre.

Mulige fordeler

Du vil som deltaker få gjennomført tre ulike tester på din helse, og vil få en nøye gjennomgang av disse helseindikatorene.

Mulige ubehag

Testing av maksimalt oksygenopptak er fysisk krevende, og dette vil oppleves ubehagelig. Men dette er en test som tar relativt kort tid og ubehaget forsvinner relativt raskt etter at testen er gjennomført.

Kapittel B - Personvern, økonomi og forsikring

Personvern

Opplysninger som registreres om deg er navn, alder, kjønn, hvilket fylke du bor i, inntektsnivå og utdanningsnivå.

Rett til innsyn og sletting av opplysninger om deg og sletting av prøver

Hvis du sier ja til å delta i studien, har du rett til å få innsyn i hvilke opplysninger som er registrert om deg. Du har videre rett til å få korrigert eventuelle feil i de opplysningene vi har registrert. Dersom du trekker deg fra studien, kan du kreve å få slettet innsamlede prøver og opplysninger, med mindre opplysningene allerede er inngått i analyser eller brukt i vitenskapelige publikasjoner.

Forsikring

Det vil ikke være registrert noen egen forsikringsordning for denne studien.

Informasjon om utfallet av studien

Du vil som deltaker i denne studien ha rett til å få informasjon om resultatet av denne studien.

Samtykke til deltakelse i studien

Jeg er villig til å delta i studien

(Signert av prosjektdeltaker, dato)

Jeg bekrefter å ha gitt informasjon om studien

(Signert, rolle i studien, dato)

Written consent, in English

Enqury regarding participation in a research project

"Participation in a mass sport event in a public health perspective"

Background and purpose

This is a question to you about participating in a research project to investigate the effect of entering a mass sport event for the first time, and the effect this have on health indicators in a public health perspective. You are asked to be a part of this study since you are a first time participants in Birkebeinerrennet. This project is a part of a master thesis conducted at the Hedmark University College.

What does this project involve?

The project will consist of two test periods. The first period will take place in November, the last period in the week before Birkebeinerrennet 2015. The tests is divided into two, one part with questionnaires, and one part with physical tests conducted at Testlab Idrett, at Hedmark University College, Elverum. Test of the different health indicators; blood pressure, body composition (InBody720) and maximal oxygen uptake will be conducted.

Possible advantages and disadvantages

Two different test periods will be conducted in this period. In each of these you will be tested in maximal oxygen uptake ($\dot{V}O_{2max}$), InBody720 (body composition) and blood pressure. You will also get an explanation of your results and a copy of those. The maximal oxygen uptake test is physical demanding, it will be conducted to exhaustion. Test of InBody720 and blood pressure is not physically demanding.

What happens with your test results, and the information about you?

The information about you and the different test will be used to investigate a possible effect participating in a mass sport event contributes to on the different health indicators.

The test results and the information about you, which is conducted, will be used as described in the purpose of the study. All of the information, and the test results will be treated without names and national identity number, or any other identification information. A code will be used in order to attach you to your results.

Only licensed personal attached to this project, which has the admittance to the list with names, and trace you.

It will not be possible to identify you in the results of the project when it is published, and the collected data will be anonymous by May 2015.

Voluntary participation

It is voluntary to participate in this project. You can at any time, and without reason draw your consent to participate in this project. If you want to participate in this project you sign the consent on the next page. If you agree to this you are able to draw your consent later without any influence on your other tests. If you later would like to draw your consent, or have any questions to this project your could contact Ingeborg Lunde, phone number 99279018, e-mail ingeborglunde@hotmail.com

Additional information about the project is in chapter A – *expand explanation about this projects purpose.*

Consent follows after chapter A and chapter B.

Chapter A- expand explanation about this projects purpose

Criteria's for participating

In this project first time participants in Birkebeinerrenet 2015 will participate. It will also be a criteria that you voluntaries' to come to Hedmark University College, Elverum for participating in this project.

Background information about this project

The purpose of this project is to investigate the participation in a mass sport events effect on the public health. Three different tests will as mentioned be completed, in addition to questionnaires. One physical test of maximal oxygen uptake, and the InBody720, body composition and blood pressure.

Timetable – what is happening and when is it happening?

These tests will be conducted twice with a space of time of approximately four months. The first round of tests will be conducted in the period from the 17th of November to the 28th of November 2014. The second round of tests will be conducted in the period from the 9th of March to the 19th of March 2015. It will in this test periods be completed the same tests, with the same procedures.

Possible advantages

You will as a participant complete three different tests presenting health indicators, and you will be given a thorough transition of these health indicators.

Possible disadvantages

The maximal oxygen uptake test is physical demanding, and this could be felt unpleasant. However, this test is completed in a relative short time, and the unpleasantness will not last for a long period of time after the test is completed.

Chapter B – Personal protection, economics and insurance

Personal protection Personvern
The information registered about you is name, age, gender, which county you live in, your level of income and your level of education.

The right to access and erase information about you and erasing the test resulst
If you agree to participate in this project you have the right to access which information is collected about you. You have further the right to correct possible wrong information collected about you. If you withdraw from the project your can demand the collected data and information about you deleted, unless the information is already a part of the analysing or other scientific publications.

Insurance
An own insurance will not be registered for this project.

Information about the results of this project
You will as a participant in this project have the right to gain information about the results in this project.

Consent to participate in this project

I am willing to participate in this project

(Signed by the participant in this project, date)

I conform getting information about this project

(Signed, roll in this project, date)

Appendix 9: NSD (Norsk samfunnsvitenskaplig datapase), in norwegian

Norsk samfunnsvitenskapelig datatjeneste AS
NORWEGIAN SOCIAL SCIENCE DATA SERVICES

Harald Hårfagres gate 29
N-5007 Bergen
Norway
Tel: +47-55 58 21 17
Fax: +47-55 58 96 50
nsd@nsd.uib.no
www.nsd.uib.no
Org.nr. 985 321 884

Giovanna Calogiuri
Institutt for idrett og aktiv livsstil Høgskolen i Hedmark, campus Elverum
Postboks 400
2418 ELVERUM

Vår dato: 03.12.2014 Vår ref: 40593 / 3 / LMR Deres dato: Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 04.11.2014. Meldingen gjelder prosjektet:

40593	*Deltakelse i et idrettsarrengement i et folkehelseperspektiv*
Behandlingsansvarlig	*Høgskolen i Hedmark, ved institusjonens øverste leder*
Daglig ansvarlig	*Giovanna Calogiuri*
Student	*Ingeborg Lunde*

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, 31.05.2015, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Katrine Utaaker Segadal

Linn-Merethe Rød

Kontaktperson: Linn-Merethe Rød tlf: 55 58 89 11
Vedlegg: Prosjektvurdering
Kopi: Ingeborg Lunde ingeborglunde@hotmail.com

Dokumentet er elektronisk produsert og godkjent ved NSDs rutiner for elektronisk godkjenning.

Personvernombudet for forskning

Prosjektvurdering - Kommentar

Prosjektnr: 40593

Formålet er å gi en forståelse av hvilken effekt deltakelse i et større idrettsarragnement for første gang har på folkehelsen.

Utvalget informeres skriftlig om prosjektet og samtykker til deltakelse. Informasjonsskrivet er godt utformet, forutsatt at følgende endringer gjøres:

- Det må tilføyes at innsamlede opplysninger anonymiseres innen mai 2015.
- Setningene vedrørende videre behandling kan fjernes, ettersom dette ikke er relevant for denne studien.

Personvernombudet legger til grunn at forsker etterfølger Høgskolen i Hedmark sine interne rutiner for datasikkerhet. Dersom personopplysninger skal lagres på privat pc/mobile enheter, bør opplysningene krypteres tilstrekkelig.

Forventet prosjektslutt er 31.05.2015. Ifølge prosjektmeldingen skal innsamlede opplysninger da anonymiseres. Anonymisering innebærer å bearbeide datamaterialet slik at ingen enkeltpersoner kan gjenkjennes. Det gjøres ved å:
- slette direkte personopplysninger (som navn/koblingsnøkkel)
- slette/omskrive indirekte personopplysninger (identifiserende sammenstilling av bakgrunnsopplysninger som f.eks. bosted/arbeidssted, alder og kjønn)

Appendix 10: REK (Regionale komiteer for medisinsk og helsefaglig forskning) document

REK
REGIONALE KOMITEER FOR MEDISINSK OG HELSEFAGLIG FORSKNINGSETIKK

Region:	Saksbehandler:	Telefon:	Vår dato:	Vår referanse:
REK sør-øst	Claus Henning Thorsen	22845515	17.11.2014	2014/1748 REK sør-øst C
			Deres dato:	**Deres referanse:**
			23.09.2014	

Vår referanse må oppgis ved alle henvendelser

Ingeborg Lunde
Høgskolen i Hedmark

2014/1748 Deltakelse i idrettsarrangement i et folkehelseperspektiv

Vi viser til søknad om forhåndsgodkjenning av ovennevnte forskningsprosjekt. Søknaden ble behandlet av Regional komité for medisinsk og helsefaglig forskningsetikk (REK sør-øst) i møtet 21.10.2014. Vurderingen er gjort med hjemmel i helseforskningsloven § 10, jf. forskningsetikkloven § 4.

Forskningsansvarlig: Høgskolen i Hedmark
Prosjektleder: Ingeborg Lunde

Prosjektomtale (original):
Dette studiet skal gi en fortåelse av hvilken effekt deltakelse i et større idrettsarragnement for første gang har i et folkehelseperpektiv. Det skal sees på ulike helseindikatorer i to ulike perioder. Det vil bli sett på både fysiske målinger og selvrapporterte målinger. Den tenkte problemstillingen er: Hvilken effekt har deltakeslse i et større idrettsarrangement (Birkebeinerrennet) for første gang på den selvrapporterte helsen og den objektive fysiske helsen, målt med helseindikatorene, VO2 maks, InBody720 (kroppssammensetning, muskelmasse, fettprosent, hofte-midjemål) og blodtrykk? Disse målingene vil og bli brukt opp mot terorier knyttet til self-determination teori, og det vil bli sett på om dette kan være geldene for folkehelsen som helhet. Det vil bli benyttet et quasi-eksperimentell design. Det blir dermed ikke et tilfeldig utvalg, men et strategisk utvalg blant de som deltar for første gang.

Vurdering
Helseforskningsloven gjelder for medisinsk og helsefaglig forskning, det vil si «virksomhet som utføres med vitenskapelig metodikk for å skaffe til veie ny kunnskap om helse og sykdom», jf. helseforskningsloven § 2, jf.§ 4.

Komiteen mener, basert på den fremlagte dokumentasjon, at studien ikke er egnet til å generere ny kunnskap om helse og sykdom, slik dette forstås i helseforskningsloven § 4.
Den positive effekten av trening er veldokumentert, og komiteen kan vanskelig se at ny kunnskap vil tilføres som følge av prosjektets gjennomføring.

Prosjektet kan gjennomføres uten godkjenning av REK innenfor de ordinære ordninger for helsetjenesten med hensyn til for eksempel regler for taushetsplikt og personvern. Søker bør derfor ta kontakt med enten forskerstøtteavdeling eller personvernombud for å avklare hvilke retningslinjer som er gjeldende.

Vedtak
Etter søknaden fremstår prosjektet ikke som egnet til å fremskaffe ny kunnskap om helse og sykdom, og det faller derfor utenfor helseforskningslovens virkeområde, jf helseforskningsloven § 2.

Komiteens avgjørelse var enstemmig.

Besøksadresse:
Gullhaugveien 1-3, 0484 Oslo

Telefon: 22845511
E-post: post@helseforskning.etikkom.no
Web: http://helseforskning.etikkom.no/

All post og e-post som inngår i saksbehandlingen, bes adressert til REK sør-øst og ikke til enkelte personer

Kindly address all mail and e-mails to the Regional Ethics Committee, REK sør-øst, not to individual staff

Komiteens vedtak kan påklages til Den nasjonale forskningsetiske komité for medisin og helsefag, jfr. helseforskningsloven § 10, tredje ledd og forvaltningsloven § 28. En eventuell klage sendes til REK sør-øst C. Klagefristen er tre uker fra mottak av dette brevet, jfr. forvaltningsloven § 29.

Vi ber om at alle henvendelser sendes inn med korrekt skjema via vår saksportal: http://helseforskning.etikkom.no. Dersom det ikke finnes passende skjema kan henvendelsen rettes på e-post til: post@helseforskning.etikkom.no

Med vennlig hilsen

Britt-Ingjerd Nesheim
prof. dr. med
leder REK sør-øst C

Claus Henning Thorsen
seniorrådgiver

Kopi til:eivind.skille@hihm.no
Høgskolen i Hedmark ved øverste administrative ledelse: postmottak@hihm.no