

Avdeling for folkehelsefag

Ingar Kristiansen

Kandidat nr. 202

Masteroppgave

Physical education seen in a public health
perspective.

Kroppsøving sett i et folkehelseperspektiv

Master i folkehelsevitenskap – med vekt på endring av livsstilvaner

2019

Samtykker til tilgjengeliggjøring i digitalt arkiv Brage JA NEI

ii. Acknowledgment

When I am now writing the last words in this master dissertation, I will look back at a challenging but very educational time. There has been periods where I was doubting myself and if there was possible for me to finish a master program beside full time work. Weekends and leisure time has been used behind the desktop, searching and reading literature relevant for my project. Step by step this dissertation has been created, and today at the National Day of Norway, there is time to celebrate.

I want to say thank you to my beloved wife, Desiree, for her patient, understanding and support in this process. I am really looking forward to spend more time together with you now when this project are finished.

I also want to say thank you to my supervisor Giovanna Calogiuri. Without your guidance and shared knowledge this project would not be what it is today. You have given my insights in research strategies in an excellent way.

Even if this is the end of my master dissertation, I hope it will open the access for further research projects inside my field of interests.

Table of content

iv. Tables and figures	6
vi. Abstract	7
vi. Norsk sammendrag	9
1. Introduction	11
1.1 Choice of theme.....	13
1.2 Research question and hypotheses	14
2. Critical literature review	16
2.1 Theoretical background for the project.....	16
2.2 Definition of Physical Activity.....	17
2.3 Trends in PA habits among the young population over the last decades.	17
2.4 Physical education policies and practice in Norway.	19
2.5 Physical activity linked to public health.....	25
2.6 Urbanization grade and Leisure Time Physical Activity (LTPA).....	35
2.7 The self-determination Theory (SDT).....	37
2.8 Perceived competence.....	40
3. Methodology	44
3.1 Research design	44
3.3 Population and selection.....	45
3.3.1 Sample.....	46
3.6 Description of the municipalities where the data collection was done.	47
3.7 Sampling strategy.....	48
3.7.1 Instruments	49
Motivation for PE.....	50
Perceived competence	51
Leisure time physical activity.....	51
Grade of urbanization and PA facilities at home.....	52
3.4 Ethical considerations.....	52
3.5 Scientific ethical principles.	53
4 Analysing data	54
4.2 Reliability and validity	54
4.2.1 Reliability	55
4.2.2 Validity.....	55
5 Results	57
5.1 Data collection process.....	57

5.2 Drop-Outs	59
5.3 Descriptive statistics and comparisons between the schools.	60
6. Discussion.	67
6.1 Discussion about the results.....	67
6.2 Discussion about method.	70
6.2.1 The sample.	70
6.2.2 Reliability.....	70
6.2.3 Validity.....	71
6.2.4 Discussion about implications of the findings.....	73
7. Conclusions.	76
viii. List of references.	78
ix. Appendices	97
9.1 <i>QUESTIONNAIRE ABOUT MOTIVATION IN PHYSICAL EDUCATION, PERCEIVED SELF COMPETENCE AND PHYSICAL ACTIVITY</i>	97
9.2 <i>Perceived Competence Questionnaire</i>	98
9.3 <i>Godin Leisure Time Exercise Questionnaire</i>	99
9.5 <i>Urbanization level questionnaire</i>	100
9.6 <i>Facilitation for Physical Activities at home</i>	100
9.7 <i>Consent form</i>	101

iv. Tables and figures

Table 1: Reduced risk for chronic conditions compared to a group of inactive unfit. (Page 16).

Table 2: SDT's levels of motivation. (Page 39).

Table 3: The data collection phases. (Page 59).

Table 4: Mean and standard deviation. (Page 61).

Table 5: Internal consistency coefficient. (Page 62).

Table 6: Correlation matrices for all variables in Trysil. (Page 64).

Table 7: Correlation matrices for all variables in Stor-Hamar. (Page 64).

Figure 1: Three psychological needs in SDT. (Page 37).

vi. Abstract

The World Health Organization (WHO), estimates that 3,3 million people die around the world every year, caused by physical inactivity (Prat. et al., 2012), and could very well be among the top ten causes of death in the world.

The Norwegian School system and its subject physical education are considered to be an arena that most people are going through early in their lives. In a public health perspective this is an important arena, where health related behavior such as physical activity level can be influenced.

The purpose of this study is *to highlight the subject physical education as an arena with potential to increase the motivation for participating in different forms of physical activities in leisure time.*

This project is based on earlier research where motivation psychology are connected to physical education and leisure time physical activity levels. The Self-Determination Theory with its components and description of motivation levels, are used as a way to understand regulation of behavior. Especially the component called *competence* are highlighted in the understanding of this. The students living environments, or urbanization level, was also highlighted as another possible correlation of leisure time physical activity.

A questionnaire was used to collect data from two high schools (Trysil and Stor-Hamar).

Totally 163 respondents where answering the questionnaire. 140 respondents in Trysil and 23 in Stor-Hamar.

The results in Trysil indicates a significant correlation ($p < 0,01$) between the students perceived competence in physical activity and leisure time physical activity level. It shows significant correlation ($p < 0,01$) between the highest level of motivation for physical education

and leisure time activity level. There was found significant correlation ($p < 0,01$) between the three highest levels of motivation for physical education and perceived competence in physical education. The findings about students living environment did not support any significant correlation between urbanization level and leisure time physical activity.

The sample from Stor-Hamar was small, and less representative than the sample from Trysil. The results from Stor-Hamar showed significant correlation ($p < 0,01$) between the two highest levels of motivation for physical education and perceived competence in physical education. This project is not highlighting the order of causation between the variables. And this should be taken in awareness. Even the results indicate great associations between variables such as motivation levels for physical education, perceived competence in physical education and leisure time physical activity, there could not be said something for certain about the causation. As an example, there should be questioned if it is the leisure time activity levels that cause perceived competence and motivation level in physical education, or if it is the opposite way.

Future research is recommended to investigate how physical education can be a tool for increased physical activity among the Norwegian population.

vi. Norsk sammendrag

Verdens helseorganisasjon (WHO) estimerer at 3,3 millioner mennesker på verdensbasis dør hvert år på grunn av fysisk inaktivitet (Prat et al.,2012), og at dette kan være en av topp ti forklaringer til dødsfall i verden.

Det norske skolesystemet, og faget kroppsøving, er vurdert som en arena folk flest går igjennom tidlig i livet. I et folkehelse perspektiv er dette en viktig arena, hvor helse relatert adferd, slik som fysisk aktivitets nivå kan bli påvirket.

Formålet med dette prosjektet er å belyse faget kroppsøving som en arena med potensial til å øke motivasjonen for å bedrive forskjellige former for fysisk aktivitet på fritiden.

Prosjektet baserer seg på tidligere forskning hvor motivasjons psykologi er knyttet til kroppsøving og fysiske aktivitetsnivåer på fritiden. Selv Bestemmelses Teorien med dennes komponenter og beskrivelse av motivasjon nivåer er brukt for å forstå adferds regulering.

Komponenten *kompetanse*, er spesielt belyst i motivasjons forståelse i dette prosjektet.

Studentenes miljø er også trukket inn som et mulig påvirknings element for graden av fysisk aktivitet på fritiden.

I data innsamlingen ble det brukt et spørreskjema for å innhente opplysninger fra to videregående skoler (Trysil og Stor-Hamar). Totalt var det 163 respondenter som svarte på spørreskjemaet. 140 respondenter fra Trysil og 23 respondenter fra Stor-Hamar.

Resultatene fra Trysil indikerer en signifikant korrelasjon ($p < 0,01$) mellom studentenes oppfattede egenkompetanse i kroppsøving og grad av fysisk aktivitet på fritiden. De viser også signifikant korrelasjon ($p < 0,01$) mellom det høyeste nivået av motivasjon for kroppsøving og grad av fysisk aktivitet på fritiden. Det ble funnet signifikant korrelasjon ($p < 0,01$) mellom de tre øverste nivåene av motivasjon for kroppsøving og oppfattet egenkompetanse i kroppsøving. Når det gjelder funnene rundt studentenes miljø ble det ikke funnet noen signifikante korrelasjoner mellom urbaniseringsgrad og grad av fysisk aktivitet på fritiden. Utvalget fra Stor-Hamar var lite, og mindre representativt enn utvalget fra Trysil. Resultatene fra Stor-Hamar viste en signifikant korrelasjon ($p < 0,01$) mellom de to høyeste nivåene av motivasjon for kroppsøving og oppfattet egenkompetanse i kroppsøving.

Dette prosjektet belyser ikke rekkefølgen av årsakssammenhenger mellom variablene. Dette er viktig å være bevisst på i forståelsen av funnene. Selv om funnene viser sterk tilknytting mellom variabler, slik som grad av motivasjon for kroppsøving, oppfattet egenkompetanse i kroppsøving og nivå av fysisk aktivitet på fritiden, så kan vi ikke være sikre på årsakssammenhengen. Som eksempel så kan det stilles spørsmål ved om det er graden av fysisk aktivitet på fritiden som påvirker oppfattet egenkompetanse og motivasjon for kroppsøving, eller motsatt.

For å undersøke nærmere hvordan kroppsøving kan være et verktøy for å øke fysisk aktivitet blant den norske befolkningen anbefales videre forskning på temaet.

1. Introduction

The tendency from the last decades is that the physical activity (PA) level among the population has decreased (Leonard, 2010). This is followed by an increase of life style diseases such as obesity, diabetes, cancer, cardiovascular diseases, depressions, bone and joint diseases (Warburton et al., 2006). The World Health Organization (WHO), estimates that 3,3 million people die around the world every year, caused by physical inactivity (Pratt et al., 2015), and could very well be among the top ten causes of death in the world.

Studies done over years are demonstrating how just a small amount of PA could decrease the risk for early mortality, by preventing many of the deadliest diseases. The greatest risk reductions are seen when comparing the groups with the lowest PA levels to the next more active groups. Several epidemiological research (Kushi et al., 1997; Leon, Connett, Jacobs, & Rauramaa, 1987; Lee & Skerrett, 2001; Lee et al., 2001; Myers et al., 2004; Paffenbarger et al., 1993), have all reported marked risk reduction with a relatively small amount of PA.

In addition to reduced risk for early mortality studies has reported better cardiovascular and muscle fitness levels, cognitive functioning, psychological well-being, and social functioning and inclusion strategies, after increased levels of PA (Bangsbo et al., 2016).

According to recent teaching plan for Physical Education (PE), the main purpose of this subject should be to inspire for physical activity (PA) in all aspects of life and for life long enjoyment of being physical active. PA is important for everyone as it fosters good health. (The Norwegian Directorate for Education and Training (Udir), 2015). The Curriculum for PE is the PE teacher's manual for how the teaching should be done in school and describes what elements who is important to focus on. The pleasure and wellbeing in the PE activities should be central for creating a lifelong motivation for PA. Many people consider PE to be a subject connected to fun and play, but it can also be an arena causing feelings of not being good

enough. This can further on lead to lack of self-esteem and sadness (Lyngstad et al.,2011). In awareness of this, Udir was arranging a seminar in Oslo, where the future of PE was discussed. It was concluded that versatility and health focus should be central, and that performance focus should be given less attention. The importance of wellbeing of PA should be given more attention (Ibid.).

Earlier studies have shown that School-based intervention programs aimed to enhance students PA levels, can positively increase those levels as well as the student's physical fitness (Dobbins et al., 2013; Sallis et al., 2011). Moreover, PE might be far-reaching arenas, well fitted to increasing people's motivation for being physical active. The large majority of the population goes through the compulsory school system early in their life.

According to the Self Determination Theory (SDT) (Deci and Ryan, 2001), the quality of motivation for a given activity is a central influencing factor on human behavior. In particular, this theory postulates conditions who support so-called *basic PSYCHOlogiat needs* (The need to feel competent, for autonomy and for social relatedness: Which will be described in more details in chapter 2.7.) The Self Determination Theory describes how higher quality forms of motivation and engagement for activities (Also known as *intrinsic motivation*), can lead to greater performance outcomes as well as enduring motivation to engage in an activity. People who are highly *intrinsically motivated* in performing a given activity, are more likely to enjoy this activity and perform it again in the future. SDT has been widely applied in the study of people's PA behaviors, also in the PE context. A meta-analysis by Owen et.al, (2014) shows scenarios that can hinder the development of intrinsic motivation. One of the reported examples was teachers who mostly had an eye for the students with good physical skills in PE. Another reported example was teachers evaluating the students by testing in them in tasks that are connected to sport. Or teachers who do not give the students who struggle to perform a task or having lack of improvements the same attention as the others. It could be assumed

that low performance students, without help from the teacher, gets lower perceived competence and decreased motivation. Scenarios like described over might be avoided when feedback is directed to improve the students perceived competence and level of motivation. When so many studies have shown the good causes of PA, there is considered as important to investigate pupil's motivation for PE, and how it's associated with their leisure time physical activity (LTPA) levels. Recent studies reported that the feeling of autonomy and perceived competence are positively predicting the motivation levels for PE and the LTPA levels. (Taylor et al. 2010; Bagøien & Halvari, 2005; Skjesol & Halvari, 2005; Halvari, Ulstad, Bagøien, & Skjesol, 2009) have all reported that perceived competence in PE was significantly positively associated with LTPA levels.

There has been done multiple school-based intervention programs with aim to increase the student's motivation for LTPA. (Franco & Coteron, 2017; Yli-Piipari et al., 2018; Meng How et al., 2013) did all indicate how intervention programs in PE, who supported the student's basic psychological needs, was giving significant changes in their LTPA levels.

When it comes to Norway there is not a lot of research that has been investigating the relation between motivation in PE and LTPA levels. This is identified as one of the gaps this project is aiming to cover.

1.1 Choice of theme

Physical activity has been highlighted as an important priority in a knowledge-based public health policy (NDH, 2008). Knowledge about reasons that are affecting peoples PA levels are important in the future work with public health. Health related habits are often created in peoples younger ages. Knowledge that could describe why children and adolescents are physical active / physical inactive could be an important contribution to the work with public health. This project will investigate the Norwegian PE practice in a public health perspective.

There will especially be pointed at the link between motivation for PE, Perceived competence in PE and the students LTPA levels.

This is expected to be important in a public health perspective, because of the health benefits of PA. Those benefits will be highlighted in chapter 2.5.

The project will also investigate if there are any relation between students PA habits and the environment where they live, such as urbanization levels and facilitations for PA at the student's home place.

1.2 Research question and hypotheses

This projects research question is:

RQ1: "Are higher ratings of perceived competence in relation to PE classes associated with higher levels of LTPA among high-school students?"

RQ2: "Are higher ratings of motivation in relation to PE classes associated with higher levels of LTPA and perceived competence in relation to PE classes among high-school students?"

RQ3: "Are higher levels of urbanization grade associated with higher levels of LTPA among high-school students?"

The hypothesis is:

H1: "It is hypothesized that higher ratings of perceived competence are positively associated with the levels of LTPA."

H2: It is hypothesized that higher ratings of more intrinsically- regulated motivations (i.e. Intrinsic motivation and Identified motivation) for PE are positively associated with the ratings of Perceived competence as well as with levels of LTPA, while Extrinsic motivation and A-motivation are negatively associated with both perceived competence and LTPA"

H3: "It is hypothesized that higher levels of urbanization grade are positively associated with higher levels of LTPA"

1.1 Limitations

Because this is a quantitative study, it will be hard to understand the result on individual level.

The study will say something about the link between the student's perceived competence, level of motivation and motivation for being physically active, but will not give in depth answers from each individual student. This could be followed up later with a qualitative study.

The study is highlighting a limited sample of high school students in Norway, and there is important to be aware of this when reading the findings. It does not necessary say something about all high school students in Norway.

Results found in this study could give indications about associations between the highlighted variables, but it will not say something of the causation. In other words, it would not be possible to conclude that for example high levels of motivation in PE are causing higher levels of LTPA. There could be the opposite way, that higher levels of LTPA are causing higher levels of motivation for PE.

1.2 Gap in literature

In the recent decades there are multiple studies who have investigated the associations between student's motivation for PE, perceived competence in PE and LTPA levels, but few of those studies are done in Norway, and there are no studies found on this topic in Trysil and Stor-Hamar. Most of the studies are highlighting a younger selection of students, while the selection in this study are in the end of their high school education.

Another topic where few research are found is on the relation between urbanization grade and level of LTPA in Norway.

2. Critical literature review

All of the articles in this study were collected from Oria, Sport Discuss, The Norwegian Directorate of Education and Training, The Norwegian Directorate of Health and Statistics Norway. In the search for other studies done on this topic, there was considered as important to find articles where the variables in the research question was central. In addition to this, elements in the Self Determination Theory, PE practices in Norway and links between PA levels and public health was added in the search. Some of the search phrases which has been used is: *Physical education, public health, urbanization, leisure time PA, Motivation, Perceived competence, autonomy and social connections, Physical activity and health, physical inactivity and health, physical activity and obesity-cancer-heart diseases-stress, happiness, wellbeing, social functioning,*

2.1 Theoretical background for the project

This chapter will describe the theoretical background for the study. First there will a description and definition of what physical activity (PA) are. After that, there will be a statement about trends in PA habits among children and adolescents in Norway, Then the practice of PE in Norway will be highlighted as a possible predictor of LTPA levels.

Following this, there will be a review of the health benefits of being physical active, linked to the most common chronic diseases.

Then the level of urbanization will be highlighted as a possible variable to describe differences in LTPA levels.

In the end of the chapter there will be a description of SDT, with an explanation about the component called competence.

2.2 Definition of Physical Activity

PA refers, in its simplest sense, to any body movements that increase the energy expenditure (Rohdes et al 2017). Very often PA is characterised with the FITT principles, where F = frequency, I = intensity, T = time and T = type. This means how often PA are done, how much effort is given, how long time the PA lasts and what type of PA is done. To measure the level of PA physiologists are often using a term they call metabolic equivalent (MET).

To meet the minimum of PA for health support, The Norwegian Directorate of Health (NDH) recommend that child's should be in PA at least 60 minutes every day. Adults at least 150 minutes with moderate activity, or 75 minutes of high intensity activities a week to prevent health problems (NDH, 2014).

2.3 Trends in PA habits among the young population over the last decades.

Samdahl et al., (2009) report about trends in lifestyle among children and adolescents from 1985 – 2005 indicates that since the beginning of 1980 there has been an increase in the access of media entertainment. The TV has been giving a wider range of channels and series that gives lots of entertainment for the people. From 1990 there was getting more common to have computers in every home, and there was growing an increased interest for computer games among child's and adolescents. Since that time the development of media entertainment have increased rapidly (Ibid.).

A report ordered by The Norwegian Directorate of Health (Andersen et al., 2008), was mapping PA levels among 9 and 15-year-old child's and adolescents. Their results showed that there among nine-year-old children was 25 % of the girls and 9 % of the boys who did not meet the recommendations about PA. In the group of 15-year-old adolescents there was 50% of the girls and 46% of the boys who did not meet the same recommendations. There was a decrease in PA levels from the age of 9 to 15.

The same report did also examine the trends in PA levels in the same groups of age from 1999-2000 to 2005-2006. The analyzes showed that there has been a positive change in the PA levels among the 9-year-old child's in this period, but no changes among the 15-year-old adolescents.

There is a wide perception among the Norwegian population that young people today are lazier and more physical inactive then they were before (Seipel et al.,2011). Data from the study of Andersen et al., (2008) and Seipel et al., (2011) indicates that this perception is not correct. Those studies show a stability in the PA levels in this group of people, with some ups and downs. But there has been changes in how PA are done and on what areas young people are active. The results from the study of Seipel et al., (2011) shows that the organized sport in sport clubs are challenged by private fitness centers. But even though, the organized sport is still having a stable or even growing member mass. The study is also showing that the number of sport clubs are increasing and are getting more differentiated.

When describing the PA levels in a population its very often focused on the organized activities, but people are also doing PA on their own. Individual PA or PA in small groups are actually the most common. These activities are normally done in immediate areas.

Results from the study of Seipel et al., (2011) shows that the PA levels since 1992 to 2010 are stable. Actually, there are more people reporting that they do exercise on their own more than 5 times a week, than it was in 1992.

One of the reasons are expected to be that the population are getting better understanding of the benefits of PA (Andersen et al.,2008), but more research are needed to examine this.

There are still almost 50% in the group of 15-year-old adolescents who are not reaching the recommended PA level (Ibid.).

What there is important to be aware of is that the mentioned research are using instruments that have measured PA, as how PA are understood, it in modern time. Mostly it is focused on exercise activities, and not on activities that are connected to work or transportation.

(Leonard) 2010, are in his study focusing on the changes in how people live their lives today compared to earlier stages of human history. He is pointing at a huge decrease of PA levels, because technology and human inventions are making every day living more comfortably and are decreasing the metabolic energy consumption.

2.4 Physical education policies and practice in Norway.

In Norway PE has traditionally had a practical approach. Elements such as sport, dance, exercise, play and outdoor life should be central (Udir, 2015). Those elements should also be seen in a health perspective. Training on the elements in PE should give versatile physical skills, and a foundation for a lifelong wellbeing in physical activities. The subject could be divided in four main components. Those are 1) *fair play and cooperation*. More precisely described as interacting with other students, including others, helping others being better by using its own competence in PE; 2) *Physical learning thru movement*. This is about using basic skills in PE activities to get more knowledge about its own body. To give every individual the best possible experience and progress every task should be personalized; 3) *Self-management and completion*. Every student should learn to manage its individual activities by him/her self; 4) *Knowledge and understanding*. Is about learning multiple sport activities and games. There is also a central part of this to understand the link between lifestyle, PA and health (Ibid.).

The recent curriculum for Norwegian physical education (2015), has the following aims for the subject: Physical education as a general study subject shall inspire physical activity in all aspects of life and inspire lifelong enjoyment of being physical active. Physical activity is

important for everyone as this fosters good health. The physical activity culture, such as play, sports, dance and outdoor life is part of how people establish their identity in society and what they have in common. The subject shall stimulate physical use of the body to enhance individual sensing, experiencing, learning and creating. The social aspects of physical activities mean that physical education is important for promoting fair play and respect for one another.

Teaching in the subject shall contribute to helping the pupils experience joy, inspiration and a sense of mastery by being physically active and by interacting with others. The subject shall also contribute to helping children and young people develop a sense of self awareness, a positive perception of the body and their own developing identity. It shall help pupils understand the ideas of an ideal body and healthy physical activity, which can influence their sense of self and ideas about health, nutrition, training and lifestyle. Pupils shall learn to understand how their own efforts can help them reach their goals, and what factors can motivate activity and training.

Pupils shall develop competence through a wide selection of play and different kinds of activities, develop versatility and learn to value exercise and visiting to nature. The subject shall help pupils acquire knowledge about exercise and training, lifestyle and health, and motivate them to have an active life and continue physical training into adulthood. The subject shall provide pupils with physical challenges and the courage to test their own limits during spontaneous and organized activities. Learning in the subject of Physical Education shall attend to traditional and alternative physical activities in the subject and stimulate experimentation and creative development. Key elements of the subject are movement and play, versatile sports, fair play, dance and outdoor life.

Learning in the subject shall provide pupils with a point of departure for lifelong enjoyment of physical activity and a sense of mastery based on own skills and ability levels. This subject is assessed using a special scheme that includes evaluating pupil effort as a part of basic subject assessment. Many of the competence aims for the subject take the pupils' own physical limitations and skills levels into consideration for assessment (Ibid.).

The subject PE are divided into three main areas based on age of the pupils:

1.-4. Grade: Physical activities in different kind of activity environments.

5.-7. Grade: Sport activities and outdoor life.

8.-10. Grade: Sport activities, outdoor life, exercise and lifestyle (Moen et al., 2018).

Each of those main areas are specified thru competence aims, that the pupils should work towards and reach before 4.- 7.- and 10. Grade.

In 2014 the municipality of Elverum initiated a research collaboration to map the status on physical education in the elementary schools of Norway. (Moen et al.,2018) Their research questions were: 1) What is the pupils in elementary school in Norway experiences of the PE subject. 2) What is the opinion of the teachers and the school leaders about this subject- and how it should be?

Those questions are largely based on current control documents given by The Education Act (2004), that is current for all education in the Norwegian school system, the curriculums general part (Ministry of Education and Research, 2006) who is a regulation to the Educational Act, and the curriculum for physical education with accompanying guidance to the curriculum (Ibid.).

Data was collected from schools localised all over Norway. There were 3226 students, 139 teachers and 46 school leaders responding. The instruments used was questionnaires.

The questions in the student questionnaire was divided in to 7 sections:

- 1) Description of the student (sex, religion, type of school, the PE teachers' sex, leisure time activities and wellbeing at school).
- 2) Why PE? (Statements of why they have PE)
- 3) Contents of PE. (Perceived contents and desired content)
- 4) Learning and teaching. (Teaching methods, basic skills and evaluation).
- 5) Other questions about PE. (How much time, areas, locker room situation, showering, changing clothes and absenting).
- 6) Opinions about PE (Perceived learning).

The seventh section was about the students experience about health but are not included in their report because the questions was not developed based on the curriculum.

The findings from this research showed that some activity forms are underprioritized. This are activities like dance, outdoor life, winter activities and modern activities, such as skating or parkour. This research indicates that dance is getting a marginalized place in PE. This stands in contrasts to the intentions in the curriculum where dance are mentioned in the purpose of the subject, as a part of the general study and identity creation in the society.

Dance are also mentioned as a competence goal at all three educational levels (1 to 4. 5. to 7. and 8.to10. Grade). Moen et al., (2018) write that there is a paradox where dance is not getting a more prominent place in the PE education, than their findings are indicating. They also write that there is a paradox that outdoor life is not getting a more prominent place in the education as long as it is one of the main competences at the upper primary level. Another paradox they are mentioning is that ball games are getting a dominating place in the education, when they are not explicit mentioned in the curriculum, but rather falling under the

category team games. According to this study, the students does not meet the entire width of content of the subject and associated competence aims (Ibid.).

When the students are asked about the content of the subject, they would have preferred a more varied activities than what they are getting in the subject.

Swimming is one of the contents in the curriculum for PE, and from 2015 there has been a stricter focus on the competence aims in swimming. In this competence aims swimming prowess are defined as being able to swim 100m breast, 100m back, in the water for 3 minutes and then dive down to pick up objects from the bottom (Utdanningsdirektoratet, 2015).

The data collection from the teachers indicates that they find it hard or even impossible to reach those competence aims.

In their study they were also investigating what kind of teaching methods was used in PE.

Their results indicate that the most normal method was instruction where the teacher shows and explains what should be done. The results did also indicate that the students would have preferred more varied methods.

The teaching method are mostly teacher directed. Students involving as a method in the teaching are not often used (Ibid.).

The Knowledge Promotion Reform (education reform introduced in 2006 in primary, lower secondary and upper secondary education and training), says that basic skills in reading, writing, calculating, oral skills and digital skills should be implemented in all subjects included PE (Udir, 2015a). The research of Moen et al., (2018) indicates that this is not happening in PE. The most common skills practiced in PE is oral skills.

Their research did also ask students and teachers about assessment practice in PE. For both groups, effort and attitude, is assumed to be important. This indicates that the evaluation practice is in accordance with the curriculum. There is also an agreement between the students

and the teachers about the weighting of the different skills and knowledges in the evaluation of the subject (Ibid.). Physical tests are still used by some PE teachers in the evaluation process. Udir (2012) are highlighting the problematic issues of using physical tests as an evaluation method. The results from Moen et al., (2018) study indicates that some teachers are choosing to not follow their advice about using physical tests in the evaluation.

A regulation given by Udir (2012), says that the student's preconditions, should not be given attention in the evaluation process. At the same time it is pointed out that when the students preconditions is a part of the competence aims, it should be a part of the evaluation (Udir 2015,a). 1/3 of the teachers answer that they consider the students preconditions in the evaluation. The result from their study indicates that there are confusion among the teachers about this issue (Moen et al., 2018).

Physical skills are considered to be important in PE. Considering the typical contents of PE in Norway, there could be raised questions if these skills mostly are connected to sports related to ball games and basic training. Its reasons to ask the question if such a narrow approach of evaluation, are in compliance with the evaluation practice given by the resent regulations.

Moen et al., (2018) is pointing at the time spend in the locker room, changing clothes, showering and being naked as a part of the PE subject. Most of the students report they do not have any problems about showering naked together, but there seems to be two main challenges. The boys are reporting fussing in the dressing room, and the girls report that they do not have enough time. It is asked questions if the school could be better to use the locker room situation as an arena for learning. Most students and teachers are reporting that the students do not have any teacher or adult responsible person together with them. 20% of youths in this age are not satisfied with their own body and they are left alone with no responsible adult. Moen et al., (2018), are criticising this, and write that there should be an adult responsible person in this situation to create a safe learning environment for all.

Its written in the purpose of the subject, that “PE shall inspire physical activity in all aspects of life and inspire lifelong enjoyment of being physical active “(Udir, 2015a). There is assumed that PE should inspire, and give motivation for lifelong PA. Most of the students are reporting that they enjoy the subject, but on the other side of the scale there is found a group who are dreading before the PE lessons. In the research of Moen et al., (2018), this group are a small percentage, but for the whole country there is as much as 14000 – 15000 students who are dreading before the PE lesson. There is assumed that this could have negative consequences for the student and its family. 4% of the students are reporting that they do not feel able to master the tasks given them in the PE lessons. The research is finding relation between the feeling of not mastering the tasks, and to dreading before the lesson (Ibid.). It is reasonable to question if the students who do not feel they master the subject, and are dreading before every PE lesson, are getting motivated for physical activities. The research does also indicate that the students who are active in sport outside school are the group who enjoy PE most.

2.5 Physical activity linked to public health.

The following section will highlight the recent evidences that are related to chronic medical conditions that could lead to early mortality and mental health diseases. The benefits of PA will be demonstrated as a prevention of those conditions.

There have over the last decades been much research which have concluded that being physical active has many positive effects on human’s health. (Kushi et al., 1997; Leon et al., 1987; Lee & Skerrett, 2001; Lee et al., 2001; Myers et al., 2004; Paffenbarger et al., 1993; Rohdes et al., 2017; Bangsbo. et.al., 2016). These studies are all reporting findings about how PA is decreasing the risk of early mortality by preventing sicknesses as cancer, heart diseases on other diseases caused by an inactive lifestyle.

Rohdes et al., (2017) observed a prevention against 25 chronic medical conditions when regular PA participating was a part of the lifestyle. According to this study there was an overwhelming support for the benefits of PA to improve the health. This study was comparing fit persons with an active lifestyle, to unfit persons with a less active lifestyle. In addition to this, there was also made a comparison with a group where aerobic training was assessed. The risk reduction is demonstrated in table 1.

Table 1: Reduced risk for chronic medical conditions compared to a group of inactive unfit (Rohdes et al., (2017).

Chronic medical condition	Physical Active / Fit Risk reduction	Aerobic fitness assessed Risk reduction
Premature all case morbidity	31%	45%
Cardiovascular disease	33%	50%
Stroke	31%	60%
Hypertension	32%	50%
Colon Cancer	30%	
Breast Cancer	20%	
Type 2 diabetes	40%	50%

This data indicates that the greatest risk reduction is reached with only a small amount of PA, but increased PA, like aerobic fitness exercise over time, will give even greater risk reduction. The presented findings above investigated the relation between PA and health in all ages, but other studies have been highlighting the importance of PA already in an early stage of life. (Libman & Arslanian, 2007; Mavrovouniouis, 2012; Shaibi et al., 2006) A study in Greece investigated the effects of physical inactivity in Greece child's and adolescents. Approximately 40 % of the Greek children aged 5 – 8 years old was found presenting higher

risk factors for heart disease, obesity, hypertension and high total cholesterol and diabetes caused by physical inactivity. (Mavrovouniouis, 2012). He argues that those diseases often are irreversible due to the continuous sedentary lifestyle that has been adopted as child. His research presented similar findings from other European countries.

In his conclusion he presents physical inactivity as a behaviour associated with adverse health consequences which initiate even though from childhood and follow children and adolescents through their lives. (Ibid.).

In Norway The Norwegian Directorate for Health highlights PA as an important way to prevent and treat chronic diseases. The report *Aktivitetshåndboken* (The Norwegian Directorate for Health (NDH), 2010) was created at order from the Norwegian department of Health and are describing the benefits of PA and how much PA that is necessary for a good health. In this report it is described how PA can prevent as much as 33 life threatening diseases such as cancer, heart diseases, obesity, to mention a few. This is supported by the WHO as they write that 3,3 million people in the world die every year because of physical inactivity (Prat et al., 2012).

In 2015 the Norwegian Directorate for Health was giving new guidelines for PA that are in line with international guide lines (NDH, 2019).

The new recommendations are differentiating between child's / adolescents and adults / elderly people and pregnant women.

Childs and adolescents should be in various forms of PA at least 1 hour every day. This activity should be vigorous for at least 3 times a week and include activities that develop muscle strength and the hearts working-capacity.

Adults and elderly people should as a minimum be in PA at a moderate intensity level for 150 minutes, or 75 minutes at vigorous intensity level. Exercises for increased muscle strength

should be done at least 2 times a week. This activity can be a part of the recommended 150 minutes a week.

Pregnant women are recommended to be in PA at moderate intensity level 150 minutes a week.

Those new recommendations are also having a chapter about reduced time spent sitting and highlight the importance of taking breaks from sitting. Those recommendations include all groups of ages (Ibid.).

As described in this section, the levels of PA are closely connected to the prevention of many medical chronic diseases. The following section will describe more specific how PA can help preventing those.

Physical activity and diabetes type 2.

Parallel to the increase in obesity there has also been an increase in the prevalence of type 2 diabetes in children and adolescents (Libman & Arslanian, 2007). The risk factors developing diabetes type 2 is, similar to adults, obesity, genetic and environmental factors. Diabetes is now one of the most common chronic diseases in the world and are recognized as a medical condition where the pancreas is not producing enough insulin, something that are causing to high blood sugar levels.

In 2013 there was 165000 Norwegians with diabetes type 2 diagnosis that used blood sugar lowering medicines and 53340 with diabetes type 2 diagnosis who do not use medicine but are having other treatment (Norwegian Institute for Public Health (NIPH), 2018).

Studies which has been examining the positive effects of PA as a prevention for developing diabetes type 2 (Viana et al., 2019; Helmer et al., 2018; Gang et al., 2007; Schrauwen, 2007) indicates there is a big agreement between research that PA are reducing the risk for developing diabetes type 2.

The reason why PA are having this positive effect in preventing diabetes type 2 could be found in the metabolism system, and how the fuel mobilization is working under PA. This is controlled by the neuroendocrine system. Under PA (But also up to 16 hours after) the secretion of insulin will be decreased. Another effect of PA is increased cell membrane glucose transportation, this again is causing improved glycemic control (Pedersen & Saltin, 2006). Most of the studies are done at adults, but the study of Shaibi et al., (2006) found an association between exercise and insulin sensitivity at adolescent males. Their study showed the same result of exercise as studies on adults. There was a significant increase in the insulin sensitivity as well as physiological fitness. They concluded that exercising is reducing the risk for type 2 diabetes in adolescents as well as adults.

Physical activity and overweight / obesity

Obesity is defined as a pathological condition caused by the nutrition or endocrine function disorders that disturb the equilibrium between the caloric contribution and the body's energetic losses, highlighted by excess body fat uniformly or localized in particular body regions (Lefter, 2011).

Recent studies are indicating that the number of people being overweight is increasing (Helmer et al., 2018; Merema et al., 2019; Lawlor, 2007). According to WHO (2003), one of the most central reasons for this is a decrease of peoples PA levels.

To determine a precise and direct relationship between obesity and mortality has been difficult, because the mortality often is caused by other diseases caused by obesity. Often the obesity becomes the indirect cause of death. Morandi & Maffeis, (2014) describe that most of the complications of obesity is metabolic disturbances induced by accumulation of fat that leads to chronic diseases such as type 2 diabetes and cardiovascular diseases. In their study they found that obesity in childhood have 3,4- fold higher risk of presenting increased carotid

intima-media thickness, which is a marker of pre-clinical atherosclerosis. Atherosclerosis are known as accumulations of fat (especially cholesterol), inflammatory cells and derived products of these in the arteries. Overweight and obesity are also associated with increased arterial stiffness. The combination of these are associated with increased risk of many heart and cardiovascular diseases, that in the second hand leads to increased morbidity (Ibid.).

The study of Lawlor, (2007) are arguing that the link between overweight and mortality is underestimated because smoking strongly masks the effects of both overweight and obesity on all-cause and cause specific mortality. This is because smoking often is decreasing the bodyweight and because of the strong effects smoking have on cardiovascular- and cancer mortality (Ibid.).

There has been done multiple studies who examine PA as a method for losing weight. (Ross et al., 2004; Slentz et al., 2005; Han et al., 2018; Ostendorf et al., 2019; Staiano, Abraham & Calvert, 2013). In the study of Slentz et.al. (2005), 175 overweight men and women followed an 8 months exercise program. They were divided into 3 groups where each group followed a specific training regime. Group 1 did low volume/moderate intensity exercise, group 2 did low volume, high intensity exercise, and group 3 did high volume, high intensity exercise. All three regimes had beneficial effects on body weight, fat mass and central obesity (Ibid.).

Physical activity and hearth and cardiovascular diseases.

Cardio vascular disease is a collective name for all kind of diseases that are affecting the hearth and veins. More people die in the world because of cardiovascular disease than by any other cause. In 2012 there was estimated that 17,5 million people died because of this, and 80 % of those death was caused by hearth attacks and strokes (WHO, 2016). Physical inactivity,

Tobacco use, unhealthy diet, harmful use of alcohol are all risk factors for cardiovascular diseases (Ibid.).

Studies are indicating that cardiovascular disease often develops during childhood, because of early obesity and an inactive lifestyle (Ng et al., 2004; Köchly et al., 2019).

Even in a very early stage of life, vessel diseases are becoming a world-wide health problem (Köchly et al., 2019), and their findings indicates that PA can have the potential to counteract the development of this.

Other research have also studied the effect PA can have to prevent cardiovascular diseases (Altavilla, Delia & Riola., 2018; Gerst & Gay, 2017; Resaland et al., 2018).

The study of Gerst and Gay (2017) was testing the relative contribution of light intensity and moderate-to-vigorous intensity physical activity to cardiovascular disease. They did not find any significant result on the relation between light intensity physical activity and reduced risk for cardiovascular disease. On the other side they found significant evidences for the relation between moderate-to-vigorous intensity physical activity and reduced risk for cardiovascular disease (Ibid.). This can indicate that exercise must be done with moderate to high intensity to have any effect on heart and cardiovascular diseases.

Physical activity and metabolic syndrome.

Metabolic syndrome is not a disease but a collective term on overweight, abdominal circumference, high blood pressure, high insulin levels and unhealthy cholesterol values. All those disruptions are increasing the risk to develop diabetes and heart diseases (NDH, 2019).

In the last decades there has been an increased number of people with metabolic syndrome in the world (White et al., 2019; NDH, 2008; Ayabe et al., 2012)

Risk factors to develop metabolic syndrome is physical inactivity, unhealthy diet, genetical factors, stress and psychological factors (NDH, 2008; Ayabe et al., 2012).

The Study of White et al., (2019) was measuring PA levels on 3165 children and adolescents by using accelerometers. The data from the participants was divided into groups based on activity levels. The results indicated that the youths who participated in longer moderate to vigorous PA had lower body mass index, waist circumference and waist to height ratio than the youths who participated in shorter moderate to vigorous PA.

There seems to be a wide agreement about PA as an important preventing and treating method to avoid metabolic syndrome (NDH, 2008).

Physical activity and cancer.

Data from Cancer registry of Norway (2017), shows that there were 33564 new incidences of cancer in 2017. 18121 of those was men, and 15443 was women. This was an increase of 2% from 2016. Cancer is a disease that has been becoming a widespread among the population and 1 of 3 Norwegians are getting cancer before they become 75 years of age (Ibid.).

According to Helsedirektoratet (2008), 25% of all cancer diagnoses are caused by a physical inactivity and overweight. PA is influencing multiple biological processes, such as metabolism, levels of sex hormones, hyperinsulinemia, insulin resistance, leptins, prostaglandins, C-reactive proteins, reducing the immune function and can influence the cells capacity for DNA repairing.

Research has found strong evidences that PA can be used as a prevention against colon and breast cancer (Mai et al., 2007; Oida, 2011; Wolin, 2006; WCRF/AICR, 2007).

In the report made by World Cancer Research Fund/American Institute for Cancer Research (2007), they are concluding that the documentation is convincing when it comes to the effect of PA to preventing colon cancer. They also conclude that PA probably have a protective effect against breast cancer and uterine cancer. It is suggested that PA should be used as way to prevent cancer in the society (Ibid.).

Physical activity and mental health.

Depression is common disease world-wide, and the incidence increases (The Norwegian Directorate of Health, 2007). WHO has been ranking depression as the fourth biggest health problem in the world.

There is no clear causation of depression but there is assumed that negative stress caused by loss experiences, traumas, offences like bullying, separations in the childhood as a line of somatic factors which could lead to depressions. How vulnerable people are for those factors are very individual (Ibid.).

Many studies have examined the link between PA and mental health (Vankim & Toben, 2013; Siefken, Junge & Laemelle, 2019; Wermelinger et al., 2018; Lloyd & Little, 2010; Kravitz, 2019; Nicole et al., 2013; Rahman et al., 2017; Franz & Hamilton, 1905; Dunn et al., 2005; Dunn and Jewel, 2010).

Already back in 1905 the first report was written about how PA could be used as a treatment method for depressions. (Franz & Hamilton, 1905).

Lloyd and Little (2010) showed in their study how levels of wellbeing increased in a group of females after they participated in a PA program. Their results indicated increased confidence among the participants after they stepped out of their comfort zone when they tried activities. One of the participants reported that after this program, she could do all those activities on her own, something she could not have been doing before the program. The program resulted in higher levels of perceived competence and increased relatedness in the group. Their study did not say anything about how long this effect was lasting.

A finding in the study of Kravitz, L. (2019) is that too much PA actually can have the opposite result. This study indicated that people who are physically active are 45% less likely to have depressive symptoms. But people who had very high levels of PA (More than 3 hours

daily), reported more depressions, than people who was physically inactive. This is important to be aware when giving future recommendations for PA.

Dunn et al., (2005) was examining the effect exercise could have to treat depressions. In their study 80 patients was grouped into 4 different exercise regimes. Group 1 and 2 was given a light exercise load 3 and 5 times a week. Group 3 and 4 was given moderate to vigorous exercise 3 and 5 times a week. Group 5 was a placebo group, who was doing some stretching and relaxing activities. The result showed that group 3 and 4 decreased the depression score with 47%, but only 30% in group 1 and 2 and 29% in group 5. They concluded that moderate to vigorous activity had a significant therapeutic effect in treatment of light to moderate depressions. Lower intensity activity had the same effect as placebo.

NDH (2007), are recommending PA activity as a way to prevent depressions and as a treatment of mild to moderate depressions. They also recommend PA as a prevention of relapse after ended treatment.

Almost 20% of the population in Norway would experience anxiety in their life, and 10 % would have this on permanent basis. Social phobia and specific phobias are the most common (Kringlen, 2001). The causes of this mental disease are many and could be found in genetical dispositions, experiences with separation, abuse and psychosocial stresses later in life.

The relation between anxiety and exercise has been extensively examined over the last decades. Petruzzelo et al (1991) did a research about this relation and found results which indicates that aerobe exercise was followed by anxiety reduction. Another study done by Kliziene, et.al. (2018) was using an eight-month intervention exercise program at to investigate what effect this could have on anxiety. The program contained of 60 minutes daily moderate to vigorous activities. The result showed statistically significant decreased anxiety levels. A study done by Nicole et al., (2013), was looking at the link between PA, anxiety and

stress. They found that students meeting the recommendations for PA reported lower levels of stress and anxiety. The study did also show that PA was increasing their levels of wellbeing. Students who reported higher levels of PA did also had higher social connection and feelings of relatedness, than students who reported low on PA. This could indicate that higher scores in mental health is predicting higher social functioning.

2.6 Urbanization grade and Leisure Time Physical Activity (LTPA).

There have been done studies investigating the link between LTPA and urbanization grade. (Moore et al., 2014; Machado-Rodrigues et al., 2011; Collins et al., 2012; Comte et al., 2013) Moore et al., (2014) did a study in some Junior High Schools in USA to investigate if there was any relation between urban and rural areas and the youth's level of PA. This study found evidences which indicated higher levels of PA among youths living in urban areas.

Collins et al., (2012) did a study in Great-Britain at 13 to 14-year-old youths. They were investigating if there was any difference in PA levels in a group living in suburb areas and a group living in rural areas. Also, this study found a difference indicating that youths living in suburb areas was more active and was using the PA facilitation at their place more than the youths coming from more rural areas.

The study of Comte et al., (2013), have similar findings. This study was done in Canada and was investigating levels of PA in a group of youths from 10 to 15 years of age. Their study concluded that youths from rural areas was more vulnerable to inactivity than youths from more urbanized areas.

There is pointed at many reasons why adolescents from more urbanized areas seems to be more physical active than the adolescents from rural areas (Sjolie & Thunen, 2012; Hagquist, 2010).

A study done to measure LTPA levels in Norway (Sjolie & Thuen, 2002), found that those differences in LTPA was not caused by differences in exercising. The reason of those

differences seemed to be that adolescents from urban areas used walking or cycling as transportation to schools, visiting friends, to activities and more. One of the findings in this study was that the median distance the adolescent walked or cycled to school was three times greater than the median distance the rural adolescents walked or cycled to a bus stop or to school (Ibid.). Making better cycle tracks and walking trails in residential areas was highlighted as a relevant public health strategy.

Trysil municipality has a big part of its population in rural areas, with long distances between schools and where adolescents have their homes. Observing how big part of the students in Trysil and Hamar who have right to school transportation, there is found a difference at 45,6 from Trysil, respective 12,3% of the kids and adolescents from Hamar who have right to school transportation.

Another factor that seems to be a driver for the LTPA level is the adolescent's socio economical background. Socio economical background are mentioned because there seems to be an indirect relation between urbanization level and educational level (SSB,2019). This seems to predict the adolescents LTPA levels. This means that there are not only the constructed environments which caused LTPA, but possibly the socio economical background of the area's inhabitants.

The study of Miklandkova, Gorny, Klimesova, (2016) and Cvetkovic et al., (2012) highlighting the parent's educational status as a predictor of pre-school children's level of participating in physical activity. They found a statistically significant relationship between the level of parent's education and economical status and the level of physical activity in their children. Another research of Elstad and Koløen (2009) were investigating how inequality in educational level was predicting health related behaviour in Norway. They found similar

results. (An association between health-related behaviour and educational level). They did also find inequalities in educational levels between urbanized and rural areas of Norway. More than 10,9 % of respondents from Oslo, Stavanger, Bergen, Trondheim had higher education. Less than 4,3% of respondents from rural areas in eastern Norway, Telemark, Agder and Trøndelag (Ibid.).

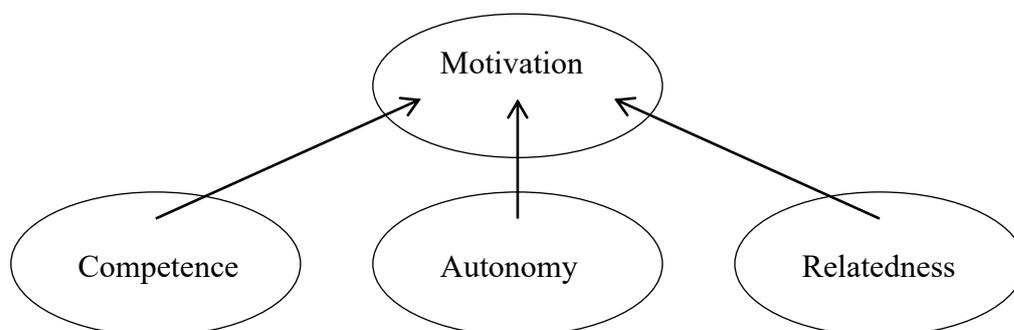
When comparing the two municipalities Trysil and Hamar, similar inequalities between urban and rural areas in educational level is found (SSB, 2019). In Hamar 10% of the population have finished higher education compared to only 4,3% in Trysil.

Those findings about the school transportation and inequalities in educational level between urban and rural areas gives assumptions that there will be seen differences in LTPA levels based on urbanization grade.

2.7 The self-determination Theory (SDT).

A major theory that explains motivation is the self-determination theory (SDT), (Deci & Ryan, 2000). This theory says that three basic psychological needs are predicting human behaviour or motivation. Those three are *competence, autonomy and relatedness*. According to SDT the satisfaction of these needs is essential for people's wellbeing.

Figure 1: Three psychological needs in SDT



The first of the three components in the SDT is *competence*. Every one of us need to feel competent. It's important for human beings to interact effectively with the environment (Williams, 2010).

The second component is called *Autonomy*. This is about a person's psychological need to feel able to participate in a decision process. If the person feels that he or she can control what should be done and how it should be done, the levels of autonomy and motivation will increase.

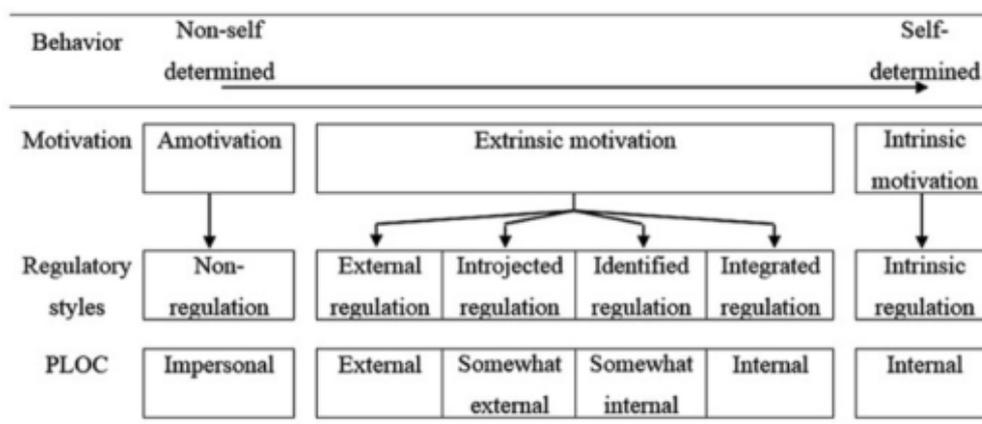
The last component is *Relatedness*. This is explained as the psychological need to feel related with others. Being a part of social connections in activities are motivating and also a part of human nature. (Williams, 2010). If one of these three psychological needs are not satisfied, ill-being and poor functioning are hypothesized to occur (Ibid.).

The SDT has become a very popular approach to understand motivation and behaviour.

This theory distinguishes between behaviours which individuals perform freely or autonomously and those they do for more or less extrinsic regulated reasons (Williams, 2010).

Extrinsic regulation is explained as various reasons for behaviour where the motivation is externally regulated. For example, when a person participates in exercise for external reasons like health effect or to get a reward of any kind. Motivation is more or less self-determined.

Various types of motivation would lead to different outcomes in behaviour. According to Deci & Ryan (2001) the motivation is varying along a self-determination continuum. The lowest is called *a-motivation*, and from there it goes from *external regulation*, thru different grades up to *intrinsic motivation* which is the highest grade of motivation. (Ibid.).

Table 2: SDT's levels of motivation.

(Deci & Ryan, 2001)

A-motivation, is described as no motivation to do the activity. The person doesn't see any reason of why the activity should be done. This is the lowest level of motivation in the SDT. The next levels are different grades of extrinsic motivation. First there is external regulation. This is about satisfying an external demand, like for example that the scholarship depends on it. Next level is introjected regulation. What motivating a person who are introjected regulated is the guilt he would feel if he does not do it. Next level is identified regulation. The person who are identified regulated will do the activity even he or she feel is unpleasant. They still do it because they want to for example improve in sport or getting a positive outcome. The highest level of motivation is intrinsic motivation. The activity is done because of the pleasure in the activity itself. The activity is done even its not giving any outcome. It is the enjoyment of the activity that drives a person who are intrinsically motivated (Williams, 2010).

To reach this highest level of motivation, all the three components in the SDT is important, and should be considered when PE teachers are planning their lessons.

An instrument which many researchers have been using to measure motivation is *Perceived Locus of Causality Scale* (PLOC). (Murcia et al., 2009; Wang et al., 2016; Pannekoek, Piek & Hagger, 2014).

Wang et al., (2014) was testing the SDT in PE to profile 4 levels of motivation by using the PLOC. (They did not include a-motivation in their study). They found evidences that the profiling using those four motivation types was giving a meaningful description of responses of the PLOC scale. A conclusion was that the results were supporting the SDT, but also that it was not only how motivated the students was, but also in what way they were motivated. (Motivated by the need for competence, relatedness or autonomy) (Ibid.).

Paenokk, Piek & Hagger, (2014) was evaluating the application of the PLOC scale in adolescents PE settings (9-12 years old). The five-factor structure based on the SDT was confirmed. Validity and reliability of the subscales was supported. They concluded that their results supported the suitability of the PLOC for assessment of motivation in PE classes for children, 9-12 years old.

Murcia et al., (2009), measured the validity of the PLOC by doing two studies in Spain. The sample size in study 1 was 1535 students, and in study 2 there was 400 students participating. All respondents were from 12 to 17 years old and from various schools in Spain. In study 1 they performed descriptive analysis. They did also an analysis of the correlations among the factors. They used a five-factor analysis of PLOC: Intrinsic motivation, identified motivation, Introjected regulation, External regulation and a-motivation.

When it comes to Norwegian studies there is not found that PLOC are used before, but it is expected that a translated version will work as intended.

2.8 Perceived competence

According to the SDT one of the basic human needs is the desire to feel competent. The level of perceived competence is describing a person's perceived ability to have success at a task.

Over the last decades there has been done a lot of research about the relation between perceived competence and LTPA level. (Madonia et al., 2014; Craike et al, 2014; Taylor et al, 2010; Bryan & Salmon, 2007; Vilchez, Ruiz & Garcia, 2017)

In Sweden there was done a study by Bryan and Salmon (2007), and they found that levels of perceived competence was correlating with intrinsic motivation.

When it comes to how children and adults judge their own levels of competence, social comparison is an important predictor. When it comes to PE, there are because of social comparison, important to create a classroom environment where there are no winner or loser. A classroom environment with no loser or winner can decrease social comparison. Studies like the one of Bryan and Solmon (2007) indicates that overemphasizing of the nature of competition and loosing or winning, will generally decrease the intrinsic motivation. The same study indicated that performing low will decrease the perceived competence.

On the other side there is studies like the one of Madonia et al., (2014) which mediated the relationship between past engagement in competitive sports, perceived competence and motivation for PA. They found that competitive sport involvement was positively predicting perceived competence and PA. They concluded that more opportunities for students to stay involved in competitive sport were important to sustain their PA levels.

In Mexico, Costa Rica and Spain there was done studies in compulsory school. This study indicated that the students need for feeling competent was important for the grade of physically activity in their leisure time. It did also indicate that the need for competence was giving more motivation. (Vilchez, Ruiz & Garcia, 2017). The conclusion in this study was that there is important to find designs in PE which could improve the students perceived competence by giving them meaningful, individual and challenging tasks. This could be done in many ways as indicated in a study done by Brancivic and Hadzikedunic (2017). They found that feedback and conversation time about learning from critic, seeing effort as the path

of mastery and bracing challenges. This kind of conversations was also important to get students opinions about what kind of exercises they like or did not like to do, and in this way creating an autonomous environment. The PE lesson itself was another thing this study was looking at. To create a best possible motivation climate, it should be given meaningful and purposeful tasks, every student should be included, good feedback should be given, and every student should focus on motivating each other. It was concluded that the intervention was giving positive effects on the students perceived competence in the experimental group. There were not any changes at the levels of perceived competence in the control group. (Brancivic and Hadzikedunic, 2017).

3. Methodology

3.1 Research design

The purpose with this study is to examine the relations between motivation for PE, perceived competence in PE, LTPA levels, and urbanization grade. There is assumed to be a correlation between all those variables.

In social science there are often distinguished between two methodological approaches. Those are called qualitative and quantitative method (Grønmo, 2004). Qualitative studies are often used to collect data about social relations, social contexts, and the context behavior and meanings are created in (Halvorsen, 2012). This is often used when the researcher will examine more in-depth individual samples, to understand more about a phenomenon (Ibid.). Quantitative methods are on the other hand often used to investigate a wider sample of the population. This method analyzes and calculate the results on relatively few variables. The results are normally given by numbers or values and are measured (Ibid.).

A quantitative approach is considered to be the most effective way in this project. The reason of this choice is that quantitative methods seems to be the most effective to answer the research questions. To highlight a population, there was needed a wider data set than what could be done with a qualitative method. The purpose is to describe and analyze differences between variables, and to explain those differences. There was also a question about time, economic and human resources when it comes to the decision to use quantitative method.

Inside quantitative methods there could be used different types of designs such as descriptive. Descriptive studies are often used to describe characteristics in a population. It can be used to find means and averages in a population at one point of time, but not for processes which goes on over time. This project will use this design and describe characteristics about a specific

part of the population which is 18-year-old high school students from Trysil and from Stor-Hamar. It will not say anything about causations happen over time. (Ringdal, 2001).

Correlation studies are determining whether or not two variables are correlated (Medbø, 2018). The correlations between two variables can vary from +1 to -1 where 1 is perfectly positively correlated and -1 is perfectly negative correlated. If the value is 0, there is no correlation at all. Correlation analysis are considered as a good way to analyze the data in this project. It's assumed to see a correlation between variables as described in the research hypothesis. To find if a correlation is significant, there are made standardized tables where significance level could be found. The significance level in correlation analyzes are depending on the sample size. I smaller sample size would require a higher correlation to be considered as significant (Bjørndal & Hofoss, 2010). It's important to be aware that correlations not necessarily are the same as associations (Jacobsen, 2005). There is not known what variable which are causing the effect on the other variable, even they are significantly correlating to each other.

Before the data collection, there was done a literature review about previous research at similar topics. To highlight the SDT there was also important to find research which examined this theory. Based on recent studies and validations of used questionnaires, the process of choosing a questionnaire fitted for this specific study started.

3.3 Population and selection

A population is the whole mass of people the project will attempt to examine (Halvorsen, 2008). The population in this project are senior high school students in Trysil and Stor-Hamar. Both schools are in the same county (Hedmark) but are representing different grade of urbanization. There was hoped to get a similar sample size from both schools, but this was not

possible as long as the project got access to only one class in Stor-Hamar.

3.3.1 Sample

One of the main reasons for choosing a quantitative method is to get a representative picture of a population (Halvorsen, 2002). Sometimes a population are big, and it could take too much time or being too expensive to collect data from the whole population. In situations like this the researcher are doing a selection to represent the population. Another benefit by collecting data from a sample is that the researcher could use more time studying every unit to avoid bias, like misunderstandings in the questionnaires or answers which could lead to decreased reliability (Ibid.).

Because of time and lack of resources there was done a selection in this project. Only 3.(2.) years senior high school students was selected. There was considered that this sample would give a representative picture of the population at the two schools. Another selection that happened, was that there was only given access to one vocational class in Stor-Hamar. This makes it reasonable to ask questions about the representativeness and the reliability of the data collected at Stor-Hamar. There could be expected that data from Stor-Hamar only represent the class data where collected from, and not the whole school. The plan from beginning was to collect data from all 3.(2.) year classes, but this did unfortunately not happen.

The sample size from Trysil was 140 participants from Trysil and 23 participants from Stor-Hamar. The whole study sample is 163 students.

In Norway the education course are 3 years in school for the study specializing classes, and 2 years in school and 2. years as apprentice in work for the vocational classes. This is the reason why 2. years classes were chosen in vocational classes. In Trysil there was given access to visit all the 3. (2.) year classes. This classes were «Education Programme for Specialization in

General Studies» and «Sports». The vocational classes “Building and construction” and “Health care, child hood and youth development ». In Stor-Hamar senior high school there was only given access to the 2. year vocational class “Health care, child hood and youth development”.

3.6 Description of the municipalities where the data collection was done.

Trysil is a rural municipality east in Norway and has 6607 inhabitants spread over the whole municipality (SSB, 2019). The area of Trysil are 3015 km². There has not been found any data about how much area that are urbanized, but the size of the municipality center Innbygda has an aerial at 3 km². 2402 of the inhabitants are living at that location. The secondary school and the senior high school are located there. Agriculture and forestry have traditionally been the most important industries in Trysil, but over the last 3 decades tourism, and especially ski tourism, has become an important industry. 25,2% of the inhabitants are living at agricultural property and 45,6% of the kids and adolescents are getting school transportation from their homes to school. The educational level in Trysil are low compared to the national average. 1191 (25%) have completed secondary school, 2362 (50%) have completed high school, 947 (20%) have completed shorter college or university education, 200 (4,2%) have completed longer college or university education and 52 person (1%) have not completed any education at all (SSB, 2019).

Hamar is a more urbanized municipality and have 31144 inhabitants. Hamar is localized 100 km south west from the municipality center of Trysil and are the biggest city in the county (Wikipedia, 2019). The area of Hamar is 351 km² and of this 12 km² are urbanized (Ibid.). 4% of the inhabitants are living at agriculture properties (SSB, 2019). Hamar has 3 secondary schools and 3 senior high schools where Stor-Hamar High School are one of them. 12,3% of the kids and adolescents are getting school transport from their home to school. The

educational level in Hamar is higher than in Trysil. 6251 (25%) have completed secondary school, 9072 (36%) have completed high school, 7091 (28%) have completed shorter college or university education, 2521 (10%) have completed longer college or university education and 175 (1%) have not completed any education (Ibid.).

3.7 Sampling strategy.

The senior high schools in Trysil, Hamar and Stor-Hamar was asked permission to let their 3. (2.) years students answer a questionnaire. Hamar senior high school refused, but Trysil- and Stor Hamar High School accepted the request. The plan was to collect from the all third-year classes, because this was considered to give a big enough sample size to give internal consistency. The reason why there was only collected data from one class in Stor-Hamar are described earlier in chapter 3.3.1.

There were done some considerations in the process of choosing how the data collection should be done. To use a questionnaire was considered to be a purposeful way to collect data, because it's reaching a large number of participants in relative short time. This is important to give reliable valid data. To get a high respondent rate, there was decided that the researcher should visit the classes in person, but this was also taking time and money. Because of this, it was chosen schools located in the researcher's home county. This was reducing the economic costs connected to traveling and was also time effective. Considering the group of respondents and the questionnaires complexity it was decided that chosen questionnaires was well designed for this group of age. Translated questionnaires was given extra attention when it comes to how easy it would be for the respondents to understand the questions.

The chosen questionnaires contained all the variables that was planned to highlight. This was motivation in PE, perceived competence and LTPA level. A questionnaire who contained questions about urbanization grade at the student's home place, and how the PA facilitation is

there, was also implemented. This was done to investigate if there were correlations between LTPA level and urbanization grade.

The questionnaires were presented the respondents thru a software called *Quest back*. The data was collected thru this software in the end of second Semester and in the beginning of the first semester.

3.7.1 Instruments

Nine different variables were collected. These variables were measured using the following instruments: *Perceived competence scale*, *Perceived Locus of Causality Scale*, *Godin's Leisure time Exercise Questionnaire* and a questionnaire where the students report how urbanized their home place are. To collect data about the variable *PA facilities at home*, parts of the survey of Dalen & Lillebø (2012) Physical Activity survey for FRIFO 2012, was used.

8 of the variables in this project are ordinal variables and 1 is an interval variable. Ordinal variables are very similar to categorical variables, but an important difference between those variables is that ordinal variables could be ordered or ranked.

Interval variables are variables where every value is equally spaced. For example, on a measuring tape from 0cm to 100cm, or the time an athlete is using in a competition. In this project values are given from a calculated MET score which can have value from 0 and up. There is not given any maximum for the highest level of MET score, but over 200 is considered to be extremely high.

5 variables are about the motivation of PE. (Intrinsic motivation, integrated-, identified-, introjected-, and external regulation, and a-motivation). Every grade of motivation is one variable, and are ranked from 1 to 5, where 1 represent the lowest score and 5 the highest. This means for example that *a motivation* with a mean value at 5 are having really low

motivation for PE. On the other hand, if there is a respondent with a mean value at 5 at the variable *intrinsic motivation*, this respondent is having extremely high levels of intrinsic motivation.

Perceived competence is an ordinal variable with 5 values, where 1 represent the lowest possible perceived competence, and 5 represent the highest possible perceived competence. As long as the value is presented as the mean of 4 questions, the result is presented with decimals.

LTPA level are an interval variable. LTPA level is calculated and given a MET score where lowest possible score are 0. Upwards it's unlimited and depends on how physical active the respondent is in leisure time.

Grade of urbanization and PA facilitations at home are ordinal variables. The less urbanized areas are given the value 1, and the most urbanized area are given value 4. PA facilitations at home contained 3 statements where the respondents answered in a cross table with 5 alternatives from *Fits very well to does not fit*.

The next section will explain those variables more.

Motivation for PE

Students motivation for PE is measured by using the Perceived Locus of Causality (PLOC) (Goudas, Biddle, & Fox, 1994). This contains of 20 items where respondents answer in a Likert scale from *not important at all* to *extremely important*. Every question represents a category of motivation. A-motivation is represented like "I don't really know why". *External regulation* is represented like "Because I will have problems if I do not". *Introjected regulation* is represented like "Because I want the teacher to think I'm a good student" *Identified regulation* is represented like "I want to learn new sport skills". *Intrinsic motivation*

is represented like “Because physical education is fun”. Every level of motivation is represented four times in the questionnaire.

The value from every variable are summarized and given a mean, and standard deviation is calculated. The variable with the highest mean will represent the respondent’s grade of motivation. To measure the internal consistency there will be done a Cronbach alpha analysis. The results about motivation for PE, will be used to see if there are any association between the level of motivation for PE, LTPA and perceived competence.

Perceived competence

As described earlier in this project, competence is assumed to be one three psychological needs in the Self-Determination-Theory (Williams et al.,2001). Perceived competence will be measured with a modified version of the Internalization of bio psychosocial values by medical students by Williams and Deci (1996). This questionnaire is short and contains of a set of only 4 different items about the students perceived competence. The original questionnaire is about learning in general. The modification is done to specify the questions more directly to PE. The first item is: *I feel confident in my ability to learn everything in physical education*. The answer is given in a cross table with 5 different values on a scale. *It doesn’t fit me at all* have value 1 and *It fits me very well* will have the value 5. A higher value indicates higher perceived competence. The next three items in the questionnaire are all very similar and measuring the students perceived ability to have success in PE. The total score would be calculated by finding the mean from those 4 items. The highest possible score will be 5 and that represent very high level of perceived competence. The lowest will be 1 and represent very low level of competence.

Leisure time physical activity.

The student’s LTPA level is measured with the “Godin leisure time exercise questionnaire.” This contains of 4 items. The 3 first items will show how often the student does strenuous,

moderate and light physical activities in a week. The score of the physical activity level is given like this: Strenuous activity is multiplied with 9, moderate with 5 and light with 3.

If a person for example is in strenuous activity 1 time a week, moderate activity 5 times a week and light activity 2 times a week, it is summarized it like this: $(9 \times 1) + (5 \times 5) + (3 \times 2) = 9 + 25 + 6 = 40$ in weekly LTPA score.

The fourth question is used as a control question and asks how often weekly leisure time activities last long enough to sweat. There should be a similarity between the 3 first questions and question 4.

The data collected from this are meant to estimate how physically active the student is in their leisure time, and hopefully answer the question if the students' physical activity levels are associated with perceived competence in PE classes.

Grade of urbanization and PA facilities at home

To find the grade of urbanization there were asked one question with 4 different possible answers. The question was: “*describe your home place*”, and the respondents could choose 1. *Forest / Mountain*. 2. *Small town* 3. *Village* 4. *City*. The smallest urbanization grade has value 1 and the highest has value 4.

Data about PA facilities at home was collected by using the same questionnaire as Dalen & Lillebø (2012) Physical Activity Survey for FRIFO 2012. This questionnaire contains of three items about the students PA facilitations at home: 1) The access to nature for doing PA; 2) The access to walk or use of bicycle to school.; 3) The access to safe places for walking and running. The answers were summarized and given a mean value.

3.4 Ethical considerations

Guidelines for research ethics given by the Norwegian National Research ethics Committee (2017) was followed in the work with this project.

Every respondent was signing a consent form where they accepted to participate in the project. This consent form was informing the participants about the project in an accurate way. They knew exactly what they were agreeing to participate in, and there were no surprises in the questionnaire. There was not made an appointment with the school's health system, as long as no questions in the questionnaire was considered to be harmful for the students. There was not collected any personal data or anything that could identify any of the respondents. The data from the questionnaire was exported to an excel file and stored on the researcher's computer. The computer was locked with username and password. All raw data will be deleted after the project is finish.

As long as the respondents were over 16 years of age, there was only necessary with consent from the respondent (Norwegian Centre for Research Data, 2019). The participants had right to know what the project was about. In the information letter there was highlighted that it was voluntary to join, and that they could cancel the participation at any moment. There was informed that no personal information would be collected.

3.5 Scientific ethical principles.

In this project there are endeavored truth and honesty. The results are objective and testable. This means that conclusions and claims could be documented. Those conclusions and claims should also be referred in a way that makes it possible for others to go back in those to control its trueness. This project is also complete. This means that the researcher is not hiding figures or findings which could debunk his/her hypothesis. (Halvorsen, 2002)

4 Analysing data.

In the preliminary analyses the data from the questionnaire software tool *Quest back* was exported back to the researcher in an excel file. Here all the values were given in words. To be able to analyse them they were given numeric values by the researcher. The PLOC contains 4 items for each level of motivation. The items for each level of motivation were organized together, and the mean and standard deviation was calculated. The same procedure was done with the variables *perceived competence*, *LTPA level* and *grade of urbanization*. To analyse the internal consistency of the collected data there was done a Cronbach alpha analysis.

The further analyses were done with *Pearson's Correlation*. This is measuring the strength and the direction of association between ranked quantitative variables. The values from a correlation analysis are varying from -1 to +1. -1 would indicate a perfect negative correlation, the value 0, indicates there is no correlation at all and the value + 1 will indicate perfect positive correlation. The correlation analysis would be done in Microsoft Excel. To find the significance levels a standardized table for Pearsons's correlation was used (Bjørndal & Hofoss, 2010).

4.2 Reliability and validity

Two central terms in science is reliability and validity. These terms are central in the quality assurance of research and the evaluation about how the measurements are done. If the respondents are answering the same questionnaire two times, and the results are the same both times the method has high reliability (Medbø, 2018). High reliability is a prerequisite to have a high validity (Ibid.).

4.2.1 Reliability

The term reliability describes how reliable the results in a study or research are. To have high reliability is a goal for every scientific project. The results from different measurements analyzing the same topic in the same population should be similar if the measurements are done twice. Measurements errors, or bias, could happen if the respondents for example are not understanding the question correctly.

There are normally two ways to work with reliability and evaluate it (Ringdal, 2001). The first is to evaluate the data collection process and if there was room for misunderstandings about the questions in the questionnaire. And it's also about the evaluation of the data set, and the search for possible bias in it. The second way to evaluate is to measure the inner consistence and a normal way to do this is by doing a Cronbach alpha test (Ibid.) Cronbach alpha can vary from 0 to 1 and should be at least 0,7 to be considered as reliable (Halvorsen, 2002). In this project Cronbach alpha was used to measure the reliability of the respondent's answers about their level of motivation for PE.

4.2.2 Validity.

Validity is a term which are used to describe if the researcher is measuring what is the most expedient to measure, or how well the collected data are corresponding with the researcher's research questions (Jacobsen, 2010). A challenge for researchers is to collect data that will answer the purpose of the study. In this project there was used questionnaires which has been used and validated by researchers before and are assumed to give data that could answer the research question.

Validity can be divided into 3 subcomponents (Jacobsen, 2010), where the first one is about validity of the terminology. This is describing if the questions in the questionnaire are measuring what its purposed to measure. The second subcomponent is called internal validity

and are describing if a researcher in his/her conclusion have good enough coverage from his/her data to draw a conclusion (Ibid.). As an example, are there not good enough internal validity to conclude that high motivation in PE are causing higher LTPA levels, even a correlation analysis shows significant correlations. There could actually be the opposite way, that there is high LTPA levels that cause high motivation for PE. The third subcomponent of the term validity is called external validity and is describing the representativeness of the findings. There could be asked if the group where data is sampled are representative for the population the research are highlighting. If data is collected from one class in a high school in Norway, the external validity will be low if the purpose was the highlight the whole school. And even lower if the results should be highlighting all high schools in the country.

5 Results.

This chapter starts with a description about the data collection process. There will be described challenges in the process and the phases will be illustrated in a table. After this there will be given a closer description about the participants, and how they responded on the research variables. Mean and standard deviation will be presented separately for the two schools in table 5. The intern reliability between the motivation variables will be controlled with a Cronbach alpha analysis and presented in table 6. Intercorrelations between all variables will be analysed with a Pearson's correlation analysis.

5.1 Data collection process

As long as all the classes were visited, there was easier to get a high response rate on the questionnaire. There was no one who refused to participate.

Trysil senior high school was visited 3 times in the second semester, and 2 times in the first semester.

The researcher was there to explain and to answer if there was any misunderstandings or other questions. A notice here is that there were a few words in the questionnaire some students did not understand. This was explained in other words and understood better after explanation. It is not known how many students who was absenting or not at school at the time the data sampling was done.

Stor-Hamar senior high school was first visited once in the second semester. This visit was a meeting together with the school administration. In the first semester there was done 1 visit and data was collected from a second-year vocational class. This class was selected, because it was the only class there was given access to.

Because the sampling did not occur in a way which allowed representativeness for the whole school, there is important to be aware that the results are only representative for the class where data is collected. There was also big difference in participates size between Trysil and Stor Hamar. This is problematic for the validity of the data analysis, and there would not be easy to compare those two schools.

The data collected in Trysil could be considered as representative for the whole school. There is assumed that this is a possible reason why Trysil was having a higher mean at LTPA level. “Sports” is a study direction where many of the students are aiming for elite sport careers, and because of this is expected to gain the mean in LTPA level for Trysil.

These issues make the researcher choose to analyse the data’s from Stor-Hamar separately.

Caution is required in the interpretations of these findings.

Tabel 3. The data collection phases:

Critical literature review	Databases: Sport Discuss, Oria, Udir and NDH.	January 2018 to April 2019
Sampling procedure	Random sampling from 3. (2.) year students in Trysil- and Stor Hamar senior high school.	Mai 2018 to October 2018
Permission needed	From school administration, teachers and students.	April 2018 to October 2018
Information collected	Questionnaire	Mai 2018 to October 2018
Recording the data	Perceived Locus of Causality scale, Perceived competence scale, Godin Leisure-Time exercise scale, description of home place PA facilitations and urbanization grade.	November 2018 to April 2019

5.2 Drop-Outs

The term Drop-Outs are used to describe people who refuse to participate or are answering in a way that makes the data's useless (Halvorsen, 2002). In the classes where data was collected there was no drop-out because of refuses. The study of the data set showed misunderstandings or unreliable answers for 11 respondents. Those respondents were pointed out in the PLOC questionnaire. They were recognized when the answer did not indicate any motivational direction, or more precisely if the mean over the motivation scale (1-5) was not varying more than 0,5. Another issue was when respondent was answering the same at every question. This

was considered as respondents without any intention of giving good answers. There was considered to exclude those, but this would have decreased the sample size. Because of this it was decided to keep them in the data material.

5.3 Descriptive statistics and comparisons between the schools.

The data from Trysil shows that 26 students are from forest/mountain, 89 from small towns, 20 from villages and 4 are from cities. The data from Stor-Hamar showed that there was no students from forest/mountain, 4 of the students is from small towns, 6 from villages and 13 from cities. The data collected in this project indicates as expected a higher grade of urbanization in Stor-Hamar than in Trysil.

The mean values for the motivation components show that most students reported high ratings of intrinsic and identified motivation, which were slightly higher in the sample from Stor-Hamar. ($M \pm SD = 3,91 \pm 1,04$ and $3,67 \pm 1,10$, respectively) than the sample from Trysil ($M \pm SD = 3,65 \pm 1,02$ and $3,64 \pm 1,03$, respectively). On the other hand, the ratings of External and Introjected were also somewhat high in Stor-Hamar. ($M \pm SD = 3,56 \pm 0,89$ and $3,25 \pm 1,10$, respectively) compared to the sample from Trysil ($M \pm SD = 3,41 \pm 0,83$ and $3,13 \pm 0,87$) The same could be observed when it comes to the rating of a-motivation in Stor-Hamar. ($M \pm SD = 2,55 \pm 0,84$) compared to the sample from Trysil ($M \pm SD = 2,46 \pm 1,03$).

The level of *perceived competence* was measured by using the perceived competence scale (PCS) (Williams and Deci, 1996). The highest possible score is 5 and the lowest is 1.

The mean values of urbanization for Trysil was lower ($M \pm SD = 2,01 \pm 0,67$) compared to the mean value for Stor-Hamar ($M \pm SD = 4,1 \pm 0,80$).

When it comes to the PA facilitations at their home place, the data from Trysil shows that 13 (9%) respondents reported very good facilitations, 49 (35%) reported quite good facilitations,

63 (45%) reported average facilitations, 14 (10%) reported quite poor facilitations and 1 (1%) reported very poor facilitations for PA. The data from Stor-Hamar shows that 6 (27%) was reporting very good facilitations, 9 (41%) was reporting quite good facilitations, 5 (23%) was reporting average facilitations, 2 (9%) was reporting quite poor facilitations for PA and 0 was reporting very poor facilitations for PA.

The students LTPA level was calculated with “Godin leisure time exercise questionnaire. There were two students from Trysil who reported extremely high levels of PA in leisure time (score 187). There were also 7 students reported extremely low (score 0). The mean value for the students in Trysil was higher (50,76) than the mean value in Stor-Hamar (23).

Table 4. Mean and Standard deviation.

		SD	Mean	SD	Mean
		Trysil	Trysil	Stor- Hamar	Stor- Hamar
Motivation	Intrinsic	1,02	3,65	1,04	3,91
	identified	1,03	3,64	1,10	3,67
	introjected	0,87	3,13	1,10	3,25
	external	0,83	3,41	0,89	3,56
	amotivation	1,03	2,46	0,84	2,55
Leisure PA score		33,74	50,76	11,8	23,00
Percieved competence		0,87	3,98	0,70	4,10
Grade of urbanization	From 1-4	0,67	2,01	0,80	3,40
PA facilitation at home		1,00	3,00	1,00	4,00

	Trysil	Stor-Hamar
Very good	9%	27%
Quite good	35%	41%
Average	45%	23%
Quite poor	10%	9%
Very Poor	1%	0%
Description of home place		
Forest / Mountain	16%	0%
Small town	64%	17%
Village	14%	20%
City	3%	56%

Preliminary analyses were done to control the internal consistency of the collected data. Table 6 presents Cronbach`s alphas for the subscales of the project.

Table 5. Internal consistency coefficient (cronback`s alpha) of the subscales.

Subscale	Trysil	Stor-Hamar
<i>Motivational orientations</i>		
Intrinsic motivation	.87	.85
Identified regulation	.86	.85
Introjected regulation	.68	.76
External regulation	.65	.63
A-motivation	.83	.62

The intercorrelation between the variables were computed separately for each school. The internal consistency must have a value at minimum 0.7 to be considered as reliable (Halvorsen, 2002). For Trysil the internal consistency is good for the variable's intrinsic motivation, identified regulation and amotivation, but it is too low to be considered reliable for the variables introjected and external regulation. For Stor-Hamar the internal consistency is good for the variable's intrinsic motivation, identified and introjected regulation. External regulation and a-motivation are too low to be considered reliable.

In order to check if the variables correlated to each other, there was done a correlation analysis. This are presented in table 7 and 8. To find the p value there are used a standardized table where Pearson's correlation coefficients are calculated (Bjørndal & Hofoss, 2003).

Table 6. Correlation matrices for all variables in Trysil.

	1	2	3	4	5	6	7	8	9
1. Intrinsic motivation	1,00								
2. Identified motivation	0,88**	1,00							
3. Introjected motivation	0,62**	0,66**	1,00						
4. External motivation	0,04	0,12	0,49**	1,00					
5. A-motivation	-0,42**	-0,41**	-0,13	0,21**	1,00				
6. LTPA level	0,24**	0,20*	0,12	-0,15	-0,13	1,00			
7. Percived competence	0,55**	0,60**	0,32**	-0,05	-0,48**	0,24**	1,00		
8. Urbanization grade	0,01	0,08	0,09	0,06	-0,09	0,14	0,07	1,00	
9. PA facilities at home	0,21**	0,24**	0,09	-0,05	-0,34**	0,12	0,26**	0,41**	1,00

** Correlation is significant at the level of 0,01

*Correlation is significant at the level of 0,05

Table 7. Correlation matrices for all variables in Stor-Hamar

	1	2	3	4	5	6	7	8	9
1. Intrinsic motivation	1,00								
2. Identified motivation	0,92**	1,00							
3. Introjected motivation	0,56**	0,58**	1,00						
4. External motivation	-0,09	0,01	0,43*	1,00					
5. A-motivation	0,03	0,13	0,15	0,31	1,00				
6. LTPA level	-0,06	-0,14	-0,06	-0,09	-0,25	1,00			
7. Percieved competence	0,57**	0,59**	0,43*	-0,18	-0,31	0,27	1,00		
8. Urbanization grade	-0,18	-0,08	-0,32	-0,12	0,26	0,16	-0,23	1,00	
9. PA facilities at home	0,11	0,08	-0,11	-0,08	-0,45*	0,45*	0,53**	0,01	1,00

** Correlation is significant at the level of 0,01

*Correlation is significant at the level of 0,05

Results from Trysil

The results showed a positive significant correlation ($p < 0,01$) between the students LTPA levels with the ratings of Intrinsic motivation, and a positive significant correlation ($p < 0,05$) between the students LTPA level with the rating of identified regulation. This indicates that higher ratings of LTPA levels were associated with more intrinsically regulated motivation

for PE. The correlation coefficient (0,24 and 0,20 respectively) also indicates a moderate to small effect size for their associations.

The result showed a positive significant correlation ($p < 0,01$) of the students perceived competence in PE with the ratings of Intrinsic and Introjected motivation ($p < 0,01$ for both), indicating that higher ratings of perceived competence were associated with more Intrinsically regulated motivation for PE. The correlation coefficient (0,55 and 0,60, respectively) also indicates a large effect size for this associations.

This correlation is smaller but still significant ($p < 0,01$) between introjected motivation and perceived competence. The correlation coefficient indicates a moderate effect size for this association.

When it comes to the lowest levels of motivation the results showed a significant negative correlation ($p < 0,01$) of the students perceived competence in PE with the ratings of a-motivation. The correlation coefficient (-0,48) indicates a large effect size for this association.

The results did not show any significant correlation between urbanization grade and LTPA level. But level of urbanization was significantly positive correlated ($p < 0,01$) to the students PA facilitations at home. The correlation coefficient (0,41) indicates a large effect size for this association.

Results Stor-Hamar

There was no significant correlation between motivation in PE and LTPA level.

No significant relations between level of motivation in PE and the students LTPA level. But it shows significant positive correlations ($p < 0,01$) between the students perceived competence in PE with the ratings of Intrinsic and Identified motivation ($p < 0,01$ for both), indicating that

higher ratings of perceived competence were associated with more Intrinsically regulated motivation for PE. The correlation coefficient (0,57 and 0,59, respectively) also indicates a large effect size for this associations.

The positive correlation between perceived competence in PE with the ratings of Introjected regulated motivation for PE was also significant ($p < 0,05$). The correlation coefficient (0,43) indicates a large effect size for this association.

There were negative correlations between perceived competence and the two lowest motivations (external regulation and a-motivation) but not significant. The correlation coefficient (-0,31) indicates a moderate correlation between perceived competence in PE and a-motivation for PE.

There was no significant relation between LTPA level and urbanization.

6. Discussion.

6.1 Discussion about the results.

In this section it is more appropriate to discuss the results from the two schools separately.

This is because some differences in results, and the sample size.

The results from Trysil was in line with the projects theoretical perspectives and hypothesis, except hypothesis 3 about level of urbanization and LTPA level.

Hypothesis 1 was that “higher ratings of perceived competence are positively associated with the levels of LTPA”. The result showed a significant correlation ($p < 0,01$) between the students perceived competence in PE and the LTPA levels.

It is important to be aware that the results only show correlations between variables and are not saying anything about the order of causations. As an example it can also be considered if there are the higher LTPA levels that are causing increased motivation by increasing the perceived competence. It could be expected that high LTPA levels give the students skills and self-esteem which further increases the motivation in PE.

Hypothesis 2 was that “higher ratings of more intrinsically- regulated motivations (i.e. Intrinsic motivation and Identified motivation) for PE are positively associated with the ratings of Perceived competence as well as with levels of LTPA, while extrinsic motivation and A-motivation are negatively associated with both perceived competence and LTPA level”.

The results from both schools indicates a significant correlation between perceived competence and motivation, and that the motivational subscales are following the levels of perceived competence as expected.

In Trysil, there was found significant correlation between LTPA level and motivation for PE.

As highlighted in the comment about hypothesis 1, it could also be seen the opposite way or it could be asked if it is the LTPA levels that are causing intrinsic motivation for PE.

The same problematic issue is found on the correlation between perceived competence in PE and level of motivation in PE. It could be questioned, as mentioned earlier, if it is the perceived competence that cause motivation, or if it is the motivation that cause the perceived competence in PE.

In the high school of Stor-Hamar the same significant correlations that was expected was not found. This could possibly be caused by the low sample size, and a lack of representativeness. The project did only reach one vocational class and not the wide range of classes, like it did in Trysil. It is possible that the results from Stor-Hamar would have been more similar to Trysil, if the project also got access to classes like “Sports” and “Study Specialization in general”. The mean MET score for LTPA levels from Stor-Hamar was only 23, while it was almost 51 in Trysil. This could indicate that the class where the data was collected, had students who were not very physically active in their leisure time.

As in Trysil there was negative relations between perceived competence and the two lowest motivations (external regulation and a-motivation) but not significant. This supports that motivation and perceived competence are closely related to each other. This is in line with the project’s theoretical perspective of the project.

Hypothesis 3 in this study is that higher levels of urbanization grade are positively associated with higher levels of LTPA”.

The results did not show any significant relation between level of urbanization and LTPA level in any of the schools.

This was surprising when so many of recent studies highlighted in this project indicates that there is a relation between urbanization grade and LTPA level. It could be asked if the results would be similar if the sample size from Stor-Hamar was bigger, or if there was used a questionnaire who also measured time spent cycling or walking to school or other activities. There is also a possibility that the public health politics in Norway are decreasing the gap between rural and urban areas when it comes to PA.

Other studies have indicated that individuals are perceiving their surroundings individually (Horodyska et.al.,2018). In this study there was 8 control variables which possibly could give an explanation of how the students perceived their PA facilitations at home:

1) The five levels of motivation: There is a significant correlation ($p < 0,01$) that students with higher levels of motivation (intrinsic motivation and identified regulation) are perceiving their PA facilitation at home in a more positive way than the students who are less motivated.

There is a significant negative correlation ($p < 0,01$) and ($p < 0,05$) between how the a-motivated students perceive their PA facilitations at home.

2) The students perceived competence shows a significant positive correlation to how the students perceive their PA facilitations at home.

3) Urbanization grade is the variable with the highest correlation to PA facilitations at home.

It is reasonable to expect that urbanized areas have more developed facilitations for PE and have a wider selection of activity possibilities. This result is also supported by earlier research that has examined the link between PA and urbanization (Moore, et al., 2014; Machado-Rodrigues et al., 2012; Collins et al. 2012; Comte et al., 2013).

Even this project are pointing out levels of motivation, perceived competence and urbanization grade as important for how the students are perceiving their PA facilitations at home, there is a possibility that there also are other factors, like hobbies, economy, gender,

ethnic background etc. that are influencing how they perceive their surroundings. This is not investigated in this project and could possibly decrease the validity of the part of the questionnaire that is measuring the variable “PA facilitation at home”.

6.2 Discussion about method.

6.2.1 The sample.

The selected sample are limited to describe one Senior High School in Trysil, and one vocational class in the Senior High Schools of Stor-Hamar. This gives limitations about who this research is reliable for (Jacobsen, 2003). If this research should have been reliable for all Senior High Schools in Norway, it would have been necessary to collect data from a much bigger sample of the population spread over the whole country (Ibid.). This was not possible because of time and economical resources.

6.2.2 Reliability.

Under the data collection it was strived to avoid bias by visiting the classes personally and give the classes information about the project and the questions in the questionnaire. After the collection process was over the researcher was going through the data material to search for bias.

The questionnaires used in this research are standardized and validated by earlier research (Williams & Deci, 1996; Moreno et al., 2009; Goudas, Biddle & Fox, 1994; Dalen & Lillebø, 2012). The reason of using standardized and validated questionnaires is to avoid bias caused by measurement errors. (Bjørndal & Hofoss, 2004).

As described earlier it is important to be aware who this research is reliable for. In the start of this project there was a goal to make the results reliable for the High Schools in Trysil and Stor-Hamar. Because of the small sample size in Stor-Hamar, the results are only reliable for this class and cannot be generalized for a bigger population. Another problem about having few respondents is decreased reliability in the data analysis itself. A bigger sample size would have increased the reliability.

Because of this, the results from Trysil would be more reliable than the results from Stor-Hamar.

Under the data collection there was discovered some reading difficulties among the students, or poor language understandings. A way to improve this could be to change words in the questionnaire to make the questions easier to understand. Another way to improve the reliability is to do a retest in the same classes, but because of time limits and limited access to the classes, this was not done. This makes it hard to say something certain about the reliability of this research.

The reliability of the 5 grades of motivation was controlled by a Cronbach's alpha analysis. The consistency in the respondent's answers about motivation was for introjected and external regulation .68 and .65 in Trysil and external regulation and a-motivation .63 and .62 in Stor-Hamar. According to Halvorsen (2002), the Cronbach's alpha should be at least .70 to be considered as reliable. Because of this, the mentioned variables could not be considered as reliable. For the other variables who measured motivation, the Cronbach alpha showed high enough values to be considered as reliable.

6.2.3 Validity.

To report higher values about positive behavior like PA is very common (NDH, 2012; Vanhelst et al., 2018). This can be problematic for the validity of the results, as long as it gives an incorrect picture of the reality (Medbø 2018). The study of Vanhelst et al., (2018) showed that among inactive adolescents 82% tended to over-estimate their PA levels. The validity of the measurements could be affected by this.

The concepts used in the questionnaire about LTPA level was differentiating between mild, moderate and strenuous exercises. Strenuous exercise was given a higher score than mild and moderate exercises when the MET score was calculated. The study of Gerst & Gay (2017), indicated that mild exercise did not have any effect on hearth and cardiovascular diseases. Seen in a public health perspective it could be questioned if the results should be differentiated in a way that highlight the respondents who did not do any moderate to strenuous exercises.

Differences in how respondents are understanding the questions in this project, could be a possible challenge about the validity. Alve & Nedrum (1998) are in their study highlighting that questionnaires validated in other countries, are not necessarily validated for Norwegians. Most of the questionnaires in this project are validated for other countries, but there was not found any specific validation for Norway. After analysing the data, it seems like the scale of motivation was working as expected.

The questionnaires were standardized with closed ended questions. This could have decreased the risks for interpreting the questions and strengthen the validity. (Halvorsen, 2012).

Furthermore, it could also be asked if the combination of questionnaires was the most fitting for this study, or if there would be similar results with other combinations, or other questions. A re-test could possibly give these results higher validity.

Questions about how many of the students that have school transportation to school because of distance, could be interesting to know more about and could possibly give other results to the relation between level of urbanization and LTPA levels. As described earlier there is an un-similarity between the municipalities about how many students have right to school transportation.

6.2.4 Discussion about implications of the findings

The large correlation coefficients between the ratings of the respondents perceived competence, more intrinsically motivation for PE and their LTPA levels, indicates that this relation should be given more attention by the school system as well as politicians and others working with public health. Especially considering the health consequences caused by a physical inactive lifestyle. The school system is a huge arena most people goes through early in their lives, and maybe the best possible arena to influence their motivation for PA.

The curriculum for PE with its guidance, are giving good directions for the contents of PE, as well as the evaluation of the students.

Udir (2012) highlights the problematic issues about using Physical test as an evaluation method. The findings in Moen et al., (2018) study indicates that many PE teachers are not following that advice. It could be questioned how physical tests influence the perceived competence and the motivation levels for the students that does not have good motorically preconditions for traditional PE activities. It could also be questioned why PE teachers do not follow the advice from Udir about evaluation in PE. As long as the results in this project are pointing out a clear relation between perceived competence and motivation, there could be assumed that the subject PE has an improvement potential. Especially if the subject should be seen in a public health perspective. If perceived competence and motivation for PE are

predicting the students LTPA levels, it would be important to find ways to improve the evaluating process in PE.

These topics are highly recommended to be followed up in future research.

The content of the subject PE could also be more varied. This would let more students find an activity they find pleasurable. According to Moen et al., (2018), ball activities are very common in the Norwegian PA practice, even if it is not specifically mentioned as a competence aim in the curriculum. It could be assumed that more diverse activities could increase the perceived competence in students who do not master ball games very well. Outdoor life, dance and winter activities is mentioned specific in the curriculum but are not often done in the Norwegian PE practise. This activity requires other skills than ball games, and it could be assumed that more students will master those skills than ball games. This would possibly increase the students perceived competence. It could be questioned why so many of the PE teachers are choosing to not follow the curriculum of PE. This question is recommended to be followed up in future research.

Almost 20% of adolescents are, according to Moen et al., (2018), unsatisfied with their body. This could also be affecting the students perceived competence and motivation for PE, as long as the students have to shower naked together in the dress room after finished PE lesson. Especially when being aware that this is a situation where no teacher are together with them. It should be considered if it would be better if an adult responsible person was there together with them in this situation.

It could be asked if PE is underprioritized when it comes to continuing education, seminars and coursing for PE teachers compared to other subjects.

From a public health perspective, PE should be given more attention as a tool to increase the motivation for a lifelong physical active life style. There is no other arena in Norway that meet this big part of the population at a young age than the school system.

7. Conclusions.

The purpose of this study was to examine if there was an association between the level of motivation in PE, the students perceived competence in PE and their LTPA level. It was also examined if there was an association between level of urbanization and LTPA level.

Based on the literature research physical inactivity is a challenge in the field of public health, and many chronic diseases can be prevented and treated with increased PA levels in the population.

Especially the results from Trysil showed a significant association between perceived competence in PE and motivation in PE, Motivation for PE and LTPA levels.

LTPA levels are important in prevention of many chronic diseases and it could be assumed that PE could have a much bigger potential in the work for public health.

The findings in this study are pointing at the importance of an increased knowledge base about how PE, as a subject in school, can be a tool for increased PA levels among adolescents.

Future research is advised to further investigate how PE can be used in a public health perspective.

viii. List of references.

- Altavilla, G., Delia, F., Raiola, G. (2018). A Brief Review of the Effects of Physical Activity in Subjects with Cardiovascular Disease: An Interpretative Key. *Sport Mont*, 16 (3), 103-107.
- Alve, S. & Nedrum, P. (1998). Reliability and validity of self-report scales developed for use in other countries. An analysis of test-retest data from four translated scales applicable to children and adolescents. *Nordisk psykologi*, 50 (4), 242-257.
- Andersen, S.A., Kolle, E., Stene-Johannesen, E., Ommundesen, Y. & Andersen, L.B., (2008). Fysisk aktivitet blant barn og unge i Norge. *En kartlegging av aktivitetsnivå og fysisk form hos 9- og 15-åringene*. Oslo: Helsedirektoratet.
- Ayabe, M., Kumahara, H., Morimura, K., Ishi, K., Sakana, N. & Tanhaka, H. (2012). Very short bouts of non-exercise physical activity associated with metabolic syndrome under free-living conditions in Japanese female adults. *European Journal of Applied Physiology*. 112 (10), 3525-3533.
- Bagøien, T. E., & Halvari, H. (2005). Autonomous motivation, involvement in physical activity, and perceived sport competence: structural and mediator models. *Perceptual and Motor Skills*, 100, 3-21.

Bjørndal, A., & Hofoss, D. (2004). Statistikk for helse og sosial fagene. Oslo: Gyldendal Akademisk.

Brankovic, E. & Hadzivadunic, M. (2017).

Physical Education Experimental Program to Test the Effect on Perceived Competence.

Sport Mont. 15 (2), 25-31.

Bryan, C.L. & Solmon, M.A. (2007). Self-Determination in Physical Education: Designing Class Environments to Promote Active Lifestyles. *Journal of Teaching in Physical Education*, 26(3), 260-279.

Cancer Registry of Norway. (2017). Cancer in Norway - Cancer incidence, mortality, survival and prevalence in Norway. Oslo: Cancer Registry of Norway.

Collins, P., Al-Nakeb, Y., Nevill, A. & Lyons, M. (2012). The Impact of the Built Environment on Young People's Physical Activity Patterns: A Suburban-Rural Comparison Using GPS. *International Journal of Environmental Research and Public Health; Basel* ,9, 3030-3050.

Comte, M., Hobin, E., Majumdar, S.R., Plotnikof, R.S., Ball, G.D., McGavock, J.(2013)

Patterns of weekday and weekend physical activity in youth in 2 Canadian provinces.

Applied Physiology, Nutrition & Metabolism, 38 (2), 115-120.

Craike, M.J., Polman, R., Eime, R., Symons, S., Harvey, J. & Paine, W. (2014) Associations Between Behaviour Regulation, Competence, Physical Activity, and Health for Adolescent

Females.

Journal of Physical Activity & Health, 11 (2), 410-419.

Curtis, E., & Drennan, J. (2013). *Quantitative Health Research: Issues and Methods*.

Maidenhead, United Kingdom: Open University Press.

Cvetkovic, N., Nicolic, D., Pavlovic, L., Djordjevic, N., Golubovic, M., Stamenkovic, S. & Velickovic, M. (2014). THE SOCIO-ECONOMIC STATUS OF PARENTS AND THEIR CHILDREN'S SPORTS ENGAGEMENT. *Facta Universitatis: Series Physical Education & Sport*, 12 (2), 179-191.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68-78.

Dalen E., Lillebø K. (2012). *Frifos Aktivitetskartlegging 2012*. Oslo: Physical Activity Survey for Frifo 2012.

Deci, E., Ryan, R., Gagne, M., Leone, D., Usunov, J. and Kornazheva, B. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former Eastern Bloc country. *Personality and Social Psychology Bulletin* (27), 930-942.

Dobbins, M., Husson, H., DeCorby, K. & LaRocca R.L. (2013). School-based physical activity programs for promoting physical activity and fitness in children and adolescents aged 6 to 18. *Cochrane Database Syst Rev*. 28(2)

Dunn, A.L., Trivedi, M.H., Kampert, J.B., Clark, C.G., Chambliss, H.O. (2005). Exercise treatment for depression: efficacy and dose response. *American Journal of Preventive Medicine*, 28(1), 140-141.

Dunn, A.L. & Jewell, J.S. (2010) The Effect of Exercise on Mental Health. *Current Sports Medicine Reports (American College of Sports Medicine)*, 9 (4), 202-208.

Elstad, J. & Koløyen, K. (2009). Utdanningsforskjeller i helse relatert atferd - like store over hele landet? Oslo: Norsk institutt for forskning om oppvekst, velferd og aldring.

Franz SL, Hamilton G.V. (1905). Effects of exercise upon the retardation in condition of depression. *Am J Insanity*, 62, 239-256.

Gang, H., Lakka, T.A., Kilpelainen, T.O., Tuomilehto, J., (2007). Epidemiological studies of exercise in diabetes prevention.

Applied Physiology, Nutrition & Metabolism, 32 (3), 583-595.

Gerst-Emerson, K. & Gay, J. (2017). Physical Activity and Cardiovascular Disease Among Older Adults: The Case of Race and Ethnicity. *Journal of Aging & Physical Activity*, 25 (4), 505-510.

Goudas, M., Biddle, S. J. H., & Fox, K. (1994). Perceived locus of causality, goal orientations and perceived competence in school physical education classes. *British Journal of Educational Psychology*, 64, 453-463.

Grønmo, S. (2004). Samfunnsvitenskapelige metoder. Bergen: Fagbokforlaget.

Halvorsen, K. (2002). Forskningsmetode for helse- og sosialfag. *En innføring i samfunnsvitenskapelig metode*. Oslo: Cappelen Akademisk forlag.

Halvari, H., Ulstad, S. O., Bagøien, T. E., & Skjesol, K. (2009). Autonomy support and its links to physical activity and competitive performance: mediations through motivation, competence, action orientation and harmonious passion, and the moderator role of autonomy support by perceived competence. *Scandinavian Journal of Educational Research*, 56, 533-555.

Han, A., Fu, A., Cogley, S. & Sanders, R.H. (2018). Effectiveness of exercise intervention on improving fundamental movement skills and motor coordination in overweight/obese children and adolescents: A systematic review. *Journal of Science & Medicine in Sport*, 21(1), 89-103.

Helmer, A., Kempf, P. & Laimer, M. (2018). The Role of Physical Exercise in Obesity and Diabetes. Universitätsklinik für Diabetes, Endokrinologie, Ernährungsmedizin und Metabolismus (UDEM), Inselspital Bern. *Swiss Sports & Exercise Medicine*, 66 (3), 36–41.

Horodyska, K., Boberska, M., Knoll, N., Scholtz, U., Radke, T., Liszewska, N., Luszczynska, A. (2018). What matters, parental or child perceptions of physical activity facilities? A

prospective parent-child study explaining physical activity and body fat among children.

Psychology of Sport & Exercise, 34, 39-47.

Jacobsen, D. I. (2003). Forståelse, beskrivelse og forklaring. Innføring i samfunnsvitenskapelig metode for helse- og sosialfagene. Kristiansand: Høyskoleforlaget AS.

Jacobsen, D.I. (2010). Hvordan gjennomføre undersøkelser – Innføring i samfunnsvitenskapelige metode. Kristiansand: Høyskoleforlaget AS.

Kliziene, I., Kimantiene, L., Citzauskas, G., Marcinkeviciute, Giedre. & Treigyte, V. (2018). Effects of an eight-month exercise intervention programme on physical activity and decrease of anxiety in elementary school children. *Baltic Journal of Sport & Health Sciences*, 111(4), 23-30.

Kravitz, L. (2019). Exercise Is Good for Mental Health: But keep in mind that overdoing it does more harm than good. *IDEA Fitness Journal*, 16(1), 12-15.

Kringlen E, Torgersen S, Cramer V. A (2001). Norwegian psychiatric epidemiological study. *Am J Psychiatry*, 158, 1091-1099.

Kushi, L.H., Fee, R.M., Folsom, A.R., Mink, P.J., Anderson, K.E., Sellers, T.A. (1997). Physical activity and mortality in postmenopausal women. *Journal of the American Medical Association*, 277(16). 1287-1293.

Köchli, S., Endes, K., Steiner, R., Enler, R., Infanger, D., Schmidt-Trucksäss, A.,...Hansen, H. (2019). Obesity, High Blood Pressure, and Physical Activity Determine Vascular Phenotype in Young Children. *Hypertension*, 73, 153-161.

Lawlor, D.A., Hart, C.L., Hole, D.J. & Smith, D.G. (2007). Reverse Causality and Confounding and the Associations of Overweight and Obesity with Mortality. *Obesity* 14(12), 2294-2304.

Lee, I.M. and Skerrett, P.J. (2001) Physical activity and all-cause mortality: what is the dose-response relation? / Activite physique et mortalite: quelle est la relation dose-effet? *Medicine & Science in Sports & Exercise*, 33(6), 459-471.

Lee, I.M., Rexrode, K.M., Cook, N.R., Hennekens, C.H. and Buring, J.E. (2001). Physical activity and breast cancer risk: the women's health study (United States). *Cancer Causes & Control*, 12(2), 137-145.

Lee, B.Y., Bartsch, S.M., Yeeli, M., Haidari, L.A., Spiker, M.L. & Gittelsohn, J. (2017). A systems approach to obesity. *Nutrition Reviews*, 75, 94-106.

Leon, A.S., Connett, J., Jacobs, D.R. and Rauramaa, R. (1987). Leisure-time physical activity levels and risk of coronary heart disease and death. The Multiple Risk Factor Intervention Trial. *Journal of the American Medical Association*, 258(17), 2388-2395.

Leonard, W.R. (2010). Size Counts: Evolutionary Perspectives on Physical Activity and Body Size From Early Hominids to Modern Humans. *Journal of Physical Activity & Health*, 7, 284-298.

Libman, I.M., Arslanian, S.A. (2007). Prevention and Treatment of Type 2 Diabetes in Youth. *Hormone Research*, 67(1), 22-34.

Lloyd, K., & Little, D.E. (2010). Self-Determination Theory as a Framework for Understanding Women's Psychological Well-Being Outcomes from Leisure-Time Physical Activity. *Leisure Sciences*, 32, 369–385.

Machado-Rodrigues, A.M., Coelho-E-Silva, M.J., Mota, J., Cumming, S.P., Riddoch, C. & Malina, R.M. (2011). Correlates of aerobic fitness in urban and rural Portuguese adolescents. *Annals of Human Biology*, 38(4), 479-485.

Madionia, J.S., Cox, A.E. & Zahl, M.L. (2014). The Role of High School Physical Activity Experience in College Students' Physical Activity Motivation. *International Journal of Exercise Science*, 7(2), 98-109.

Mai, P.I., Sauulivan-Halley, J., Ursin, G., Stram, D.O., Deapen, D., Villaluna, D.,...Bernstein, L. (2007). Physical Activity and Colon Cancer Risk among Women in the California Teachers Study. *Cancer Epidemiology, Biomarkers & Prevention*, 16(3), 517-526.

Mavrovouniouis, F. (2012). Inactivity in Childhood and Adolescence: A Modern Lifestyle Associated with Adverse Health Consequences. *Sport Science Review*, 21(3/4), 75-99.

Merema, M., O'Connell, E., Joice, S., Woods, J. & Sullivan, D. (2019). Trends in body mass index and obesity prevalence in Western Australian adults, 2002 to 2015. *Health Promotion Journal of Australia*, 30, 60-65.

Medbø, J.I. (2018). Innføring i statistikk og dataanalyse- for studenter i helse og idrettsfag. Oslo: Cappelen Damm AS.

Miklankova, L., Gorny, M. & Klimesova, I. (2016). The relationship between the family's socio-economic status and physical activity level of pre-school children. *Trends in Sport Sciences*, 23(4), 193-202.

Moore, H.J., Nixon, C.A., Lake, A.A., Douthwaite, W., Omalley, C.L., Pedley, C.L.,...Routen, A.C. (2014). The Environment Can Explain Differences in Adolescents' Daily Physical Activity Levels Living in a Deprived Urban Area: Cross-Sectional Study Using Accelerometry, GPS, and Focus Groups. *Journal of Physical Activity & Health*, 11(8), 1517-1524.

Morandi, A. & Maffeis, C. (2014). Predictors of Metabolic Risk in Childhood Obesity. Hormone research in pædiatrics: from developmental endocrinology to clinical research, *Horm Res Paediatr*, 82, 3-14.

Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, M., Margono, C.,... Kakidou, E. (2004). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the Global Burden of Disease Study. *Lancet Lond. Engl.* 384, 766-781.

Nicole A. VanKim, M.P.H., Toben, F. and Nelson, S. (2013). Vigorous Physical Activity, Mental Health, Perceived Stress, and Socializing Among College Students. *American Journal of Health Promotion.* 28, 7-15.

Murcia, J.A.M., Coll, D.G. & Garzon, M.C. (2009). Preliminary Validation in Spanish of a Scale Designed to Measure Motivation in Physical Education Classes: The Perceived Locus of Causality (PLOC) Scale. *The Spanish Journal of Psychology*, 12, 327-337.

Norwegian Center for Resarch Data (2019) Consent. Located at:

https://nsd.no/personvernombud/en/help/information_consent/

Norwegian Institute of Public health (2018) Public health report. *Health Status in Norway 2018*. Located at: <https://www.fhi.no/en/op/hin/>

Oida, Y. (2011). Evidence based health promotion by exercise and physical activity. *Advances in Exercise & Sports Physiology* 17(2), 39.

Ostendorf, D.M., Caldwell, A.E., Creasy, S.A., Pan, Z., Lyden, K., Bergouignan, A.,...Catenacci, W.A. (2019). Physical Activity Energy Expenditure and Total Daily Energy Expenditure in Successful Weight Loss Maintainers. *Obesity* 27(3), 496-504.

Owen, K., Smith, J., Lubans, D.R., Ng, J.Y., Lonsdale, C. (2014). Self-determined motivation and physical activity in children and adolescents: a systematic review and meta-analysis. A systematic review and meta-analysis. *Preventive Medicine*, 67, 270-279.

Paffenbarger, R.S. (1993). The influence of adopting a physically active lifestyle on mortality rates of middle-aged and elderly men. *Dept. of Health and Sport Science, Tokyo Gakugei University*, 1, 45-54.

Pannekoek, L., Piek, J.P. & Hagger, M.S. (2014). The Children's Perceived Locus of Causality Scale for Physical Education. *Journal of Teaching in Physical Education*. 33(2), 62-85.

Petruzzello, S.J., Landers, D.M., Hatfield, B.D., Kubitz, K.A. & Salazar, W. (1991). A meta-analysis on the anxiety-reducing effects of acute and chronic exercise: outcomes and mechanisms. / Meta-analyse des effets de l' exercice aigu et chronique pour reduire l' anxiete. Resultats et mecanismes. *Sports Medicine*, 11(3),143-182.

Pratt, M., Norris, J., Lobelo, F., Roux, R. & Wang, G. (2015). The cost of physical inactivity: moving into the 21st century. *British Journal of Sports Medicine*, 48(3), 171-173.

Rahman, M.Z., El Werfalli, R. and Lehmann-Waldau, F. (2017). Current Evidence and Use of Physical Activity in the Treatment of Mental Illness: A Literature Review. *Deutsche Zeitschrift für Sportmedizin*, 68(4), 93-99.

Resaland, G.K., Aadland, E., Nilsen, A.K.O., Bartholomev, J.B., Andersen, L.B. & Andersen, S.A. (2018). The effect of a two-year school-based daily physical activity intervention on a clustered CVD risk factor score—The Sogndal school-interventionstudy. *Scandinavian Journal of Medicine & Science in Sports*. 28(3), 1027-1035.

Ringdal, K. (2001). *Enhet og mangfold*. Bergen: Fagbokforlaget.

Rohdes, R.E., Jahnsen, I., Bredin, S.S.D., Warburton, D.E.R., Bauman, A. (2017). Physical activity: Health impact, prevalence, correlates and interventions. *Psychology & Health*, 32(8), 942-975.

Ross, R., Janssen, I., Dawson, J., Kungl, A.M., Kuk, J.L., Wong, S.L...Hudson, R. (2004). Exercise-induced reduction in obesity and insulin resistance in women: a randomized controlled trial. *Obes Res*, 12(5), 789-798.

Ryan, R.E., Jansson, I., Shannon S.D.B., Darren, E.R.W. and Adrian, B. (2017). Physical activity: Health impact, prevalence, correlates and interventions. *Psychology & Health*, 32(8), 942–975,

- Sallis, J.F., McKenzie, T.L., Alcaraz, J.E., Kolody, B., Faucette, N. & Hovell M.F. (1997). The effects of a 2-year physical education program (SPARK) on physical activity and fitness in elementary school students. *Sports Play and Active Recreation for Kids. Am J Public Health*, 87(8), 1328-1334.
- Samdal, O., Leversen, I., Torsheim, T., Skar Manger, M., Brunborg, G.S. & Wold, B, (2009). "Trender i helse og livsstil blant barn og unge 1985-2005 - Norske resultater fra studien" Helsevaner blant skoleelever. En WHO-undersøkelse i flere land". Research Centre for Health Promotion, The University of Bergen,
- Schrauwen, P. (2007). Physical activity and diabetes: current considerations. *Applied Physiology, Nutrition & Metabolism*, 32(3), 535.
- Skjesol, K., & Halvari, H. (2005). Motivational climate, achievement goals, perceived sport competence, and involvement in physical activity: structural and mediator models. *Perceptual and Motor Skills*, 100(2), 497-523
- Seipel, Ø., Strandbu, Å. & Aaboen-Sletten, M. (2011). Ungdom og trening Endring over tid og sosiale skillelinjer. Norsk institutt for forskning om oppvekst, velferd og aldring NOVA Rapport 3/2011.

Siefken, K., Junge, A. & Laemelle, L. (2019). How does sport affect mental health? An investigation into the relationship of leisure-time physical activity with depression and anxiety. *Human Movement*, 20, 62-74.

Sjolie, A.N. & Thuen, F. (2002). School journeys and leisure activities in rural and urban adolescents in Norway. *Health Promot Int.* 17, 21-30.

Slentz, C.A., Aiken, L.B., Houmard, J.A., Bales, C.V., Johnson, J.L., Tanner. C... Krauz, W.E. (2005). Inactivity, exercise, and visceral fat. STRRIDE: a randomized, controlled study of exercise intensity and amount. *Journal of Applied Physiology*, 99(4), 1613-1619.

Staiano, A.E., Abraham, A.A. & Clavert, S.L. (2013). Adolescent exergame play for weight loss and psychosocial improvement: A controlled physical activity intervention. *Obesity*, 21(3), 598-603.

Standage, M., Duda, Joan. L. & Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories to predict physical activity intentions. *Journal of Educational Psychology*, 95(1), 97-110.

Statistics Norway. (2019). Municipality facts Hamar. Located at:

<https://www.ssb.no/kommunefakta/hamar>

Statistics Norway. (2019). Municipality facts Trysil. Located at:

<https://www.ssb.no/kommunefakta/trysil>

The Educational Act (2004). Act relating to primary and secondary education and training (the Education Act). Located at: https://lovdata.no/dokument/NL/lov/1998-07-17-61/KAPITTEL_1#KAPITTEL_1

Taylor, I.M., Ntoumamis, N., Standage, M., Spray, C.M. (2010). Motivational Predictors of Physical Education Students' Effort, Exercise Intentions, and Leisure-Time Physical Activity: A Multilevel Linear Growth Analysis. *Journal of Sport & Exercise Psychology*, 32, 99-120.

Taylor, I.M., (2017). Reciprocal effects of motivation in physical education and self-reported physical activity. *Psychology of sport and exercise*. 31, 131-138.

Tudor, L.C., Jones, G.R., Myers, A.M., Paterson, D.H. and Ecclestone, N.A. (2002). Contribution of structured exercise class participation and informal walking for exercise to daily physical activity in community-dwelling older adults. / Etude de la place occupee par l' exercice physique dans l' activite physique journaliere des personnes agees. *Research Quarterly for Exercise & Sport*, 73(3), 350-356.

The Norwegian Directorate for Education and Training. (2006). The Curriculum for Knowledge Promotion in Primary and Secondary Education and Training
Located at : [https:// www.udir.no/laring-og-trivsel/lareplanverket/hvordan-er-lareplanene-bygd-opp/](https://www.udir.no/laring-og-trivsel/lareplanverket/hvordan-er-lareplanene-bygd-opp/)

The Norwegian Directorate of Health. (2008). Aktivitetshåndboken- *Fysisk aktivitet I forebygging og behandling*. Located at:

<https://helsedirektoratet.no/Lists/Publikasjoner/Attachments/463/Aktivitetshandboken-IS-1592.pdf>

The Norwegian Directorate of Health. (2016). Statistics on physical activity level and sitting time. Located at: <https://www.helsedirektoratet.no/tema/fysisk-aktivitet/statistikk-om-fysisk-aktivitetsniva-og-stillesitting>

The Norwegian Directorate of Health. (2014). Recommendations on diet, nutrition and physical activity. Located at : <https://helsedirektoratet.no/publikasjoner/anbefalinger-om-kosthold-ertering-og-fysisk-aktivitet>

The Norwegian Directorate for Education and Training. (2015). Curriculum for Physical Education. Located at: <https://www.udir.no/laring-og-trivsel/lareplanverket/finn-lareplan/#kroppsoving>

The Norwegian Directorate for Education and Training. (2015). Physical Education: Guide to curriculum. Located at: https://www.udir.no/Upload/larerplaner/forsok/Kroppsoving_i_skolen_rapport_060611.pdf

The Norwegian Directorate for Education and Training. (2006). Curriculum in outdoor life - optional program subjects in education programs for sports. Located at: https://www.udir.no/k106/IDR7-01/Hele/Komplett_visning

The Norwegian Directorate for Education and Training. (2012). Changes in the subject Physical Education, Udir-8-2012. Located at:

<https://www.udir.no/regelverkstolkninger/opplaring/Innhold-i-opplaringen/Udir-8-2012/>

The Norwegian Directorate for Education and Training. (2015b). Physical Education - Guidance to the curriculum. Located at: [https://www.udir.no/laring-og-](https://www.udir.no/laring-og-trivsel/lareplanverket/veiledning-til-lp/kroppsoving-veiledning/)

[trivsel/lareplanverket/veiledning-til-lp/kroppsoving-veiledning/](https://www.udir.no/laring-og-trivsel/lareplanverket/veiledning-til-lp/kroppsoving-veiledning/)

The Norwegian National Committees for Research Ethics. (2017). The Act on ethics and integrity in research. Located at: [https://www.etikkom.no/en/library/practical-](https://www.etikkom.no/en/library/practical-information/legal-statutes-and-guidelines/the-act-on-ethics-and-integrity-in-research/)

[information/legal-statutes-and-guidelines/the-act-on-ethics-and-integrity-in-research/](https://www.etikkom.no/en/library/practical-information/legal-statutes-and-guidelines/the-act-on-ethics-and-integrity-in-research/)

Vanhelst, J., Beghin, L., Duhamel, A., De Henauw, S., Reutz, J.R., Kafatos, A...Gottrand, F., (2018). Physical activity awareness of European adolescents: The HELENA study. *Journal of Sports Sciences*, 36 (5), 558-564.

Vankim, N.A. & Nelson, T.F. (2013) Vigorous Physical Activity, Mental Health, Perceived Stress, and Socializing Among College Students. *American Journal of Health Promotion*, 28, 7-15.

Viana, A.A., Fernades, B., Alvarez, C., Guiramaes, G.V., Ciolac, E.G. (2019). Prescribing high-intensity interval exercise by RPE in individuals with type 2 diabetes: metabolic and hemodynamic responses. *Applied Physiology, Nutrition & Metabolism*, 44(4), 348-356.

Vílchez, M. P., Ruiz-Juan, F. & García, M. E., (2017). Transcultural study of perceived competence in physical education and leisure time. *Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte*, 7(67), 573-588.

Wang, J.C.K., Morin, A.J.S., Ryan, R.M., Liu, W.C., Wang, J.C. & Morin, A.J. (2016). Students' Motivational Profiles in the Physical Education Context. *Journal of Sport & Exercise Psychology*, 38(6), 612-630.

Warburton, D.E.R., Nicol, C.W. & Bredin, S.S.D. (2006). Health benefits of physical activity: the evidence. *Canadian Medical Association Journal*, 174(6), 801-809.

Wermelinger Avila, M.P., Correa, J.C., Lucchetti, A.L.G., Lucchetti, G. (2018) The Role of Physical Activity in the Association Between Resilience and Mental Health in Older Adults. *Journal of Aging & Physical Activity*, 26(2), 248-253.

WHO (2003). Diet, nutrition and the prevention of chronic disease. WHO Technical Report Series 916. Geneva: World Health Organization.

WHO. (2016). Hearts: technical package for cardiovascular disease management in primary health care. Located at:

https://www.who.int/cardiovascular_diseases/hearts/Hearts_package.pdf

White, D., Oh, Y. & Willis, E.A.,(2019) The Effect of Physical Activity Bout Patterns on Metabolic Syndrome Risk Factors in Youth: National Health and Nutrition Examination Survey 2003–2006. *Journal of Physical Activity & Health*, 16, 12-21.

Williams, G. C., & Deci, E. L. (1996). Internalization of biopsychosocial values by medical students: A test of self-determination theory. *Journal of Personality and Social Psychology*, 70, 767-779.

Williams, J.M. (2010). *Applied Sport Psychology. University of Arizona, Emeritus*. 6, 71-73.

World Cancer Research Fund/American Institute for Cancer Research. (2007). *Food, Nutrition, Physical Activity and the Prevention of Cancer: A Global Perspective*. Washington DC: AICR.

ix. Appendices

9.1 QUESTIONNAIRE ABOUT MOTIVATION IN PHYSICAL EDUCATION, PERCEIVED SELF COMPETENCE AND PHYSICAL ACTIVITY

Age

For each question below, set a circle around the number that best suits your perception of the importance of the question.

MOTIVATION IN PHYSICAL EDUCATION

Question	Importance				
	Not important at all	Not really important	No idea	A little important	Extremely important
Because physical education is fun	1	2	3	4	5
Because I want to learn sports skills	1	2	3	4	5
Because I want the teacher to think I am a good student.	1	2	3	4	5
Because I will have problems if I do not.	1	2	3	4	5
But I do not really know why	1	2	3	4	5
Because I enjoy learning new skills	1	2	3	4	5
Because it is important for me to do well in physical education.	1	2	3	4	5
Because I would feel bad about myself if I did not.	1	2	3	4	5
Because that's what I'm supposed to do.	1	2	3	4	5
But I do not understand why we should have physical education.	1	2	3	4	5
Because physical education is stimulating.	1	2	3	4	5
Because I want to improve in the sport.	1	2	3	4	5
Because I want other students to think I'm good.	1	2	3	4	5
So that the teacher does not yell at me.	1	2	3	4	5
But I really feel like I'm wasting my time in physical education	1	2	3	4	5

For the satisfaction I feel as I learn new skills / techniques	1	2	3	4	5
Because I can learn skills I could use in other areas of my life.	1	2	3	4	5
Because it worries me when I do not.	1	2	3	4	5
Because that's the norm.	1	2	3	4	5
But I can not understand what I am getting out of physical education.	1	2	3	4	5

9.2 Perceived Competence Questionnaire

For each question below, set a circle around the number that best suits your perception of the importance of the question.

Question					
	Not correct at all	Not really correct	No idea	A little correct	Extremely correct
I feel confident in my ability to learn everything in physical education.	1	2	3	4	5
I am capable of learning the skills in this course.	1	2	3	4	5
I am able to achieve my goals in this course	1	2	3	4	5
I feel able to meet the challenge of performing well in this subject	1	2	3	4	5

9.3 Godin Leisure Time Exercise Questionnaire

During a typical **7-Day period** (a week), how many times on the average do you do the following kinds of exercise for **more than 15 minutes** during your free time (write on each line the appropriate number).

- | | Times Per
Week |
|--|---------------------------|
| <p>a) STRENUOUS EXERCISE
 (HEART BEATS RAPIDLY)
 (e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)</p> | _____ |
| <p>b) MODERATE EXERCISE
 (NOT EXHAUSTING)
 (e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)</p> | _____ |
| <p>c) MILD EXERCISE
 (MINIMAL EFFORT)
 (e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)</p> | _____ |

2. During a typical **7-Day period** (a week), in your leisure time, how often do you engage in any regular activity **long enough to work up a sweat** (heart beats rapidly)?

OFTEN

SOMETIMES

NEVER/RARELY

1.

2.

3.

9.5 Urbanization level questionnaire

Describe your home by choosing one of the alternatives:

Forest/ Mountain

Small town

Village

City

9.6 Facilitation for Physical Activities at home

Describe the facilities for Physical Activities at your home. Choose the answer that fits the statement best for your home place.

1. The nature is available for physical activity at home

Not correct

A little right

Don't know

Quite correct

Very correct

2. My place is well organized to use cycle to and back from school.

Not correct

A little right

Don't know

Quite correct

Very correct

3. I have good opportunities to walk, jog and exercise in safe places

Not correct

A little right

Don't know

Quite correct

Very correct

This is the end of the questionnaire, thank you for participating.

9.7 Consent form

Forespørsel om deltakelse i forskningsprosjektet

Kroppsøving og motivasjon for en fysisk aktiv livstil

Bakgrunn og formål

Formålet med kroppsøving er at det skal inspirere til en fysisk aktiv livsstil og livslang bevegelsesglede. Bevegelse er grunnleggende hos mennesket og fysisk aktivitet er viktig for å fremme god helse.

Med dette prosjektet ønsker jeg å sette lyset på hvordan faget kroppsøving påvirker motivasjonen for varig bevegelsesglede og slik sett har en positiv innvirkning på folkehelsen.

Prosjektet ønsker å belyse tre forskningsspørsmål:

1. Er høyere nivåer av oppfattet egenkompetanse i kroppsøvingsfaget assosiert med høyere nivåer av fysisk aktivitet på fritiden blant elever i videregående skole?
2. Er høyere nivåer av motivasjon i kroppsøvingsfaget assosiert med høyere nivåer av fysisk aktivitet på fritiden og oppfattet egenkompetanse i kroppsøving blant elever på videregående skole?
3. Er større urbaniseringsgrad assosiert med høyere nivåer av fysisk aktivitet på fritiden blant elever i videregående skole?

Utvalget som denne studien vil undersøke er elever på Trysil og Stor-Hamar Videregående Skole. Bakgrunnen for dette valget er geografisk tilknytning til skolested og bosted.

Hva innebærer deltakelse i studien?

Deltakelse i denne studien innebærer besvarelse av en spørreundersøkelse som varer i ca 20 minutter.

Spørsmålene vil omhandle faget kroppsøving og hvordan det motiverer deg for en fysisk aktiv livsstil.

Spørreundersøkelsen vil være helt anonym, og ingen personopplysninger vil lagres.

Hva skjer med informasjonen om deg?

Det vil ikke innhentes noen form for personopplysninger, og det vil heller ikke være mulig å gjenkjenne personer ut fra publikasjonen.

Prosjektet skal etter planen avsluttes 18. Mai 2019

Frivillig deltakelse

Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn. Dersom du trekker deg, vil alle opplysninger du har gitt bli slettet.

Dersom du ønsker å delta eller har spørsmål til studien, ta kontakt med Ingar Kristiansen på mobil 46668180. Min veileder i dette studiet er Giovanna Calogiuri.

Studien er meldt til Personvernombudet for forskning, NSD - Norsk senter for forskningsdata AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og er villig til å delta

(Signert av prosjektdeltaker, dato)