Høgskolen i Hedmark

Faculty of Public Health

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# Masterthesis

# Association between Sense of Coherence and participation in a free offer of exercise for pregnant women

## Sammenheng mellom Sense of Coherence og deltakelse i gratistilbudet trening for gravide

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# Forword

After being as a nurse for almost ten years, working with patients and treatment of serious diseases, I have experienced how important it is to have good mental and physical health. And if you get sick, it is an advantage to be healthy. I have seen that severe disease can cause a motivation or a need to change lifestyle. I have asked my self, why wait until you absolutely have to change your lifestyle, or wait so long that it is perhaps too late? What can be done so everyone has an equal opportunity to choose health? And can I be a part of the work to give everyone an equal chance to choose health?

It has been exiting, rewarding and challenging to be a student again. The Master program in public health, have given me a unique opportunity to think, work and expand my knowledge in relation to be a health professional and a private person. These two years has given me a desire to learn more and continue studying.

I would like to thank Wenche Røset, the leader of “Frisklivsentralen”, who introduced me to the free offer of exercise for pregnant women. She has been positive and helpful in this process. I also want to thank the midwives at the locale Health Centre, who did a remarkable job of including as many pregnant women as possible in this project. A thank to the staff at the schools library, who always do their best to help.

Most of all I want to thank my supervisor Giovanna Calogiuri, who has in a "Socratic method" been absolutely outstanding. She has through the good questions, given me the ability to find the knowledge I did not even know I could find. She has been the professional, supportive and realistic “midwife” to my “pregnancy” and birth of this project. She has always given me constructive feedbacks, in a positive and motivating way, Thank you.

I also want to thank my husband Lars and daughter Lilly, who has been patient and supportive along the way. I love you so much.

Elverum 18.05.2015

Siv Lena Birkheim

## Abstract

**Background:** Pregnant women are generally too sedentary. Physical activity during pregnancy is associated with both physical and mental benefits. Free offer of exercise for pregnant women is a unique offer organized from the "Frisklivssentralen" in the municipality. The free offer is a part of the work in reducing social inequalities and promoting public health.

**Purpose:** Antonovskys familiar core concept, Sense of Coherence (SOC) is applied in several different research contexts, but not often used among pregnant women. The aim was to investigate whether there is any association with SOC and the participation of the free offer of exercise. And to examine if age, education, ethnical background, weeks of pregnancy, former birth and level of physical activity have any influence on the women's SOC and participation in the free offer of exercise.

**Method:** Quantitative project including 56 voluntary pregnant women with no exclusion criteria. The respondents answered one questionnaire compounded of three sections. The data were statistically analysed with help from SPSS. Descriptive analysis, before Pearson correlation coefficient was used as a statistic technique.

**Result:** No significant findings between the participation in the free offer of exercise and level of SOC (r= 0.005, P=0.972). It was neither found any significant relation between the SOC and intention to participate (r=-0.69, P=0.613), or between the SOC and physical level (r=-0.016,P=0.905). The analysis showed a strong relationship between participation in the free offer and level of physical activity(r=0.363, P=0.006). It was a significant relationship between SOC and former birth. (r= 0.271, P= 0.44). Other nationality showed a negative association with participation in the free offer. Education showed a noticeable pattern of association, but no significant correlation (r=0.102, P=0.455).

**Conclusion**: Findings from this particular study, showed that mapping the pregnant women SOC might not be a useful tool when it comes to contribute to inclusion in the free offer of exercise for pregnant women. However, the result from this project may contribute with information, which may be helpful to the organizers of the free offer of exercise. Findings from this project provided new information in this area, which contributes to fill the gap.

# Norsk sammendrag

**Bakgrunn:** Gravide er generelt for lite fysisk aktive. Å være fysisk aktiv under graviditet har vist seg å ha bade psykiske og fysiske fordeler. Gratis trening for gravide, er et unikt tilbud arrangert av Frisklivssentralen. Dette gratistilbudet er en del av jobben mot å redusere sosial ulikhet i helse og å forbedre folkehelsen.

**Formål:** Antonovskys velkjente begrep Sense of Coherence (SOC)(Følelse av å ha sammenheng) er ofte anvendt i ulike forskningssammenhenger, med sjelden blant gravide. SOC ble i dette prosjektet brukt til å undersøke om det finnes noen sammenheng med deltakelse i gratistilbudet trening for gravide. Videre ble det undersøkt om alder, utdanning, etnisk bakgrunn, antall uker gravid, tidligere fødte barn og grad av fysisk aktivitet hadde noen innvirkning på de gravide kvinners SOC og deltakelse dette gratistilbudet.

**Metode:** Det ble utført en kvantitativ tilnærming til prosjektet, som inneholdt 56 frivillige gravide kvinner, hvorav ingen ekskluderings kriterier. Respondentene svarte på et spørreskjema som inneholdt tre ulike deler. Data ble behandlet statistisk med hjelp fra SPSS. Det ble først utført en deskriptiv analyse, før Pearson korrelasjon ble brukt som statistisk analyseverktøy.

**Resultat:** Det ble ikke funnet noen signifikant assosiasjon mellom SOC og deltakelse i gratistilbudet trening for gravide ($r=0.005$, $P=0.972$). Det var heller ingen tydelig sammenheng mellom SOC og intensjonen om å delta i gratistilbudet trening for gravide ($r=-0.69$, $P=0.613$), eller mellom SOC og nivå av fysisk aktivitet ($r=0.016$, $P=0.905$). Analysen viste en sterk sammenheng mellom deltakelse av gratistilbud trening for gravide og høyere nivå av fysisk aktivitet ($r=0.363$, $P=0.006$). Det var en signifikant sammenheng mellom sterk SOC og de som hadde barn fra tidligere ($r=0.271$, $P=0.44$). Gruppen med annen nasjonalitet viste i dette prosjektet en negativ assosiasjon med deltakelse i gratistilbud trening for gravide ($r=-0.215$, $P=0.111$).

**Konklusjon:** Dette prosjektet viser at kartlegging av de gravide kvinners SOC ikke nødvendigvis er et nyttig verktøy når det kommer til å forklare hvem som benytter seg av gratistilbudet trening for gravide. Men andre resultater fra prosjektet er informasjon som kan være til hjelp for de som arrangerer gratistilbudet trening for gravide. Dette prosjektet er et bidrag til å fylle gapet som eksisterer når det kommer til SOC, graviditet og fysisk aktivitet.

# List of abbreviations

| | |
|---|---|
| C | Comprehensibility |
| GP | General Practioner |
| MA | Manageability |
| ME | Meaningfulness |
| N | Number |
| NSD | Norsk Samfunnsvitenskapelig Datatjeneste |
| r | Pearson correlation coefficient |
| SD | Standard Deviations |
| SOC | Sense of Coherence |
| SPSS | Statistical Package for the Social Sciences |
| TPB | Theory of planned behaviour |

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# 1. Introduction

Pregnancy is a good time to develop new or continue healthy lifestyle habits (Ribeiro & Milanez, 2011). The lifestyle during pregnancy is very important for the health of the child and the mother. Many women are motivated to change lifestyle habits when they become pregnant (Norwegian Directorate of Health, 2011).

Physical activity during pregnancy is associated with benefits for both physical and mental health (Gjestland, Bø, Owe, & Eberhard-Gran, 2012). How different women cope with this new situation, may vary from women to women (Antonovsky, 1979). Pregnancy is a finite event, with a well-identified endpoint, unlike many other stressful life events. This leads to an opportunity to examine women during a special time of the life (Bendiksen, 2010a).

Participation in a free offer of exercise for pregnant women, may give the pregnant women knowledge and a better health to cope with pregnancy and offspring (Yali & Lobel, 2010). Knowledge considering physical activity during pregnancy and sociodemographic predictors of exercise behaviour is of public health importance (Gjestland et al. 2012).

The free offer of exercise for pregnant women is a part of the work at "Frisklivssentralen". The Norwegian Directorate of Health (2013) believe that "Frisklivssentraler" are an important contribution for the intersectoral public health work, to increase health promotion and prevention efforts in the municipalities in Norway. Physical activity is a source of health and wellbeing, in addition to raise sense of mastery and pleasure of being in shape. Local low threshold offer and motivation are necessary measures to increase the level of physical activity in the population (Norwegian Directorate of Health, 2013). The low-threshold offer: Free exercise for pregnant women is an offer that embraces every pregnant woman in the municipality, but are especially aimed at inactive pregnant women. The group training is free, takes place once a week, requires few equipment and no special skills. The pregnant women get the opportunity to be physical active and meet other women in the same situation, which could be a good starting point to build social networks (Skramstad, 2013).

To try to get a picture of the pregnant women who utilize the free offer of exercise, it is interesting to measure the participation of the free offer in context with Sense of Coherence. Sense of Coherence (SOC) is the key concept of the salutogenic theory developed of Aaron Antonovsky (1979). It is not considered as a coping strategy, but rather an orientation of life.

High level or strong Sense of Coherence is related with good health (Lindstrøm & Eriksson, 2010). Antonovsky (1979) claims there is a correlation between physical health and the level of Sense of Coherence. People with strong SOC seem to be more physical active, than those with weak SOC. According to the three core concepts of the SOC, would a pregnant women with strong SOC, regardless if the pregnancy is planned or not, understand the new situation (comprehensibility). She would believe she have got the necessary resources available to find solutions to challenges that may occur (manageability), and she would at the same time experience the challenges during pregnancy as motivating (meaningfulness) (Lindstrøm & Eriksson, 2010).

Earlier studies have suggested that stronger SOC is associated with higher levels of physical activity and healthy lifestyle choices (Ing & Reutter, 2003; Oz, Sarid, Peleg , & Sheiner, 2009; Togari, Yamazaki, Takayama, Yamaki, & Nakayama, 2008; Wainwright, Surtees, Welch, Luben, Khaw, & Bingham, 2008). Based on this research, measuring SOC may be one way to aid the design of future health promotion interventions (Wainwright, Surtes, Welch, Luben, Khaw, & Bingham, 2007).

Health professionals in antenatal care have a unique opportunity to inform the pregnant women about healthy lifestyle choices (Vedøy & Lie, 2014). Nevertheless do several pregnant women report lack of this information from the health professionals in their antenatal care (Clarke, Gross, & Psychol, 2004). This research project may help to ensure that all pregnant women who visit their midwife, receive the same information about the free offer of exercise for pregnant.

Antonovsky claims that childhood conditions like social position of the family and economic conditions, as well as the class position held in the adulthood, is of importance for the formation of a strong or weak SOC. Which leads to the social inequality of health. The Government believes it is important to include all people to offers that are intended to promote health, and believe that we have enough knowledge to take action. We must simultaneously strengthen knowledge about the causes of social inequalities and effective measures, so that the measures we implement will increasingly be more accurate (Ministry of Health and Care Services, 2007).

## 1.1 Background

The salutogenic way of thinking has been of great interest since I read about it in the nursing college. I strongly believe in teaching people to swim, instead of building bridges or giving people great lifejackets. To be able “to swim” is an important skill in relation with others, society in general and in one's own life. After searching a bit in around, looking for offers that can motivate and help people to change their lifestyle, I was introduced to the free offer of exercise for pregnant women. Physical activity is important for every human being, also the pregnant women. Based on the low number of pregnant women who are physically active, the information the health authorities provide is apparently not enough.

## 1.2 Pregnancy and physical activity

A normal pregnancy lasts from 40-42 weeks. Pregnancy is divided into three trimesters:

- First Trimester- until week 12

-Second trimester- from week 13-28

-Third trimester- from week 29 and until birth (Bendiksen R., 2010a)

The pregnancy is a dynamic process that is constantly changing. The most known and familiar physiological changes is presented in a table with information from chapter 3 of the book “The new life”, Bendiksen (2010b):

**Table 1: Familiar physiological changes during pregnancy**

| **Physical symptoms** | **Proposed reason** |
|---|---|
| Weight gain | The normal weight gain is 12.5 kg |
| Edema, often seen as swollen legs and arms | The pregnant body collects fluid of uncertain reasons. Probably an effect of the hormone oestrogen |
| Shortness of breath | When the blood volume increases, so does the need for more oxygen through the lungs. The oxygen consumption is changed from 250 ml/min to 300 ml/min. Growing uterus may be pushed up against the diaphragm |
| Nausea and vomiting | Increased levels of hormones |
| Increased heartbeat | The blood volume increases with 1,5 l during pregnancy. This is followed by increased heartbeat and heart rate |
| Fatigue | Pregnancy hormones |
| Frequent urination | Kidney works harder to get rid of waste product from the mother and the fetus. The uterine grows and fetus moving against the bladder trigger the urination |
| Lower abdominal pain | Pulling of ligaments around the uterus |

There are separate guidelines on diet, nutrition and physical activity for pregnant women according to Norwegian Directorate of Health (2014). Women, who have not been physically active prior pregnancy, should participate in physical activity of moderate intensity and gradually increase the activity of at least 150 minutes a week. Women, who have been regular active before pregnancy, should continue to participate in physical activity at the same level with adaptations. Activities with high risk of falling, for examples riding,

skiing downhill and contact sports (handball and football), could increase the risk of injuries and should be avoided. The same guidelines indicate no limitations for being active after pregnancy. Every woman should be encouraged to be as physically active as possible during pregnancy. This advice is particularly important considering the women who gains more weight than recommended during pregnancy, and for those who are already struggling obesity (Norwegian Directorate of Health, 2014).

## 1.3 The free offer of exercise

The free offer of exercise for pregnant women is a part of the work at "Frisklivssentralen". "Frisklivssentralen" is a way of organizing work that aims to strengthen the bridge between the health services and the broad public health. The main goal of the work of health promotion is to improve health in the population, reduce health inequalities between social classes, ethnic groups and genders (Ministry of Health and Care Services, 2007). Lifestyle is a key issue in public health, also when it comes to pregnant women. The free exercise for pregnant women is an offer especially aimed to pregnant women who are inactive, but it embraces every pregnant woman in the municipality.

The participation in the free offer is independent of earlier level of physical activity and physical condition (Skramstad, 2013). The offer is organized into a group. A group in general, may be explained by a gathering of at least 3 persons that interact to achieve a goal or complete a task (Svedberg, 2002). This group of exercise takes place once a week, requires few equipment and no special skills (Skramstad, 2013). A physiotherapist with expertise in training for pregnant women is responsible of leading the groups. The midwife and the public health nurse will also visit the trainings, where they will be available for questions and feedback from the pregnant women. This is a measure that allows antenatal care to focus on health, rather than risk. Like in line with the theory of Antonovsky (1979), which it is not just about preventing disease, but try to move the pregnant women toward improved health and wellness by utilizing their own available resources (Browne, O´brien, Taylor, Bowman, & Davis, 2014).

The Government shows great importance to the work of the national public health. The municipalities themselves are responsible for maintaining an overview of challenges and opportunities of necessity (Ministry of Health and Care Services, 2013). Free exercise for pregnant women is one of the measures the municipality elect in turns to promote the health

of the population. According to the Norwegian national strategy to reduce social inequalities in health (Ministry of Health and Care Services, 2007), targeted and tailored measures are not always the best policy instruments. In many cases it may be stigmatizing and therefore counterproductive. General welfare systems as low threshold are less stigmatizing and helps to prevent people ending up in vulnerable situations (Ministry of Health and Care Services, 2007). To achieve increased physical activity in the population, the Ministry of Health and Care Services (2004) believe that local low threshold offers and motivation in direction of an active lifestyle is necessary actions.

## 1.4 Social inequalities in health among pregnant women

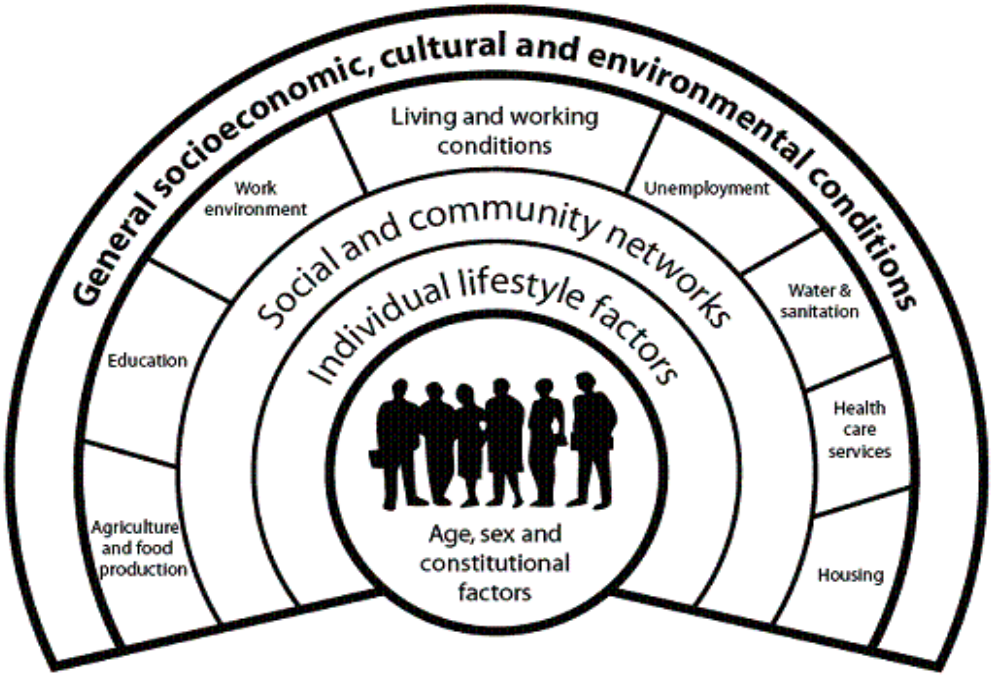
Public health is according to the World Health Organization (1986), refered as all organized measures who work with preventing disease, promoting helath and prolonging of the life among all people in the population. Health promotion involves working of a more even social distribution of factors that affect health. Health is unevenly distributed between social groups in the population and there are many factors that contribute to creating and maintaining social inequalities in health (Ministry of Health and Care Services, 2007).

The free offer of exercise for pregnant women is a measure to inform the pregnant women about the importance of physical activity and provide an exercise activity that requiring little equipment and no special background expertise (Skramstad, 2013). In order to say something more about the background of this offer and try to say something about the women who utilize the offer, it is important to include an understanding of the social determinants of health. The following definition was located at the WHO homepage:

> The social determinants of health are the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels. The social determinants of health are mostly responsible for health inequities - the unfair and avoidable differences in health status seen within and between countries (World Health Organization, 2013).

Lifestyle factors may function as a biological explanation of health/illness. The social model may bring us alternatives explanation of different factors (Nash, 2010). These wider factors that influences the health are shown in a figure made by Dahlgren and Whitehead (1991).

**Figure 1: The main determinants of health (Dahlgren & Whitehead, 1991)**




This figure shows the relationship between the individual constitutional factors, environment and structural factors (Dahlgren & Whitehead, 1991).

Social inequality in health is perceived as a major challenge in today's society because of several reasons. Lifestyle factors play a central role, together with people in lower social groups who are deprived opportunities, life chances and freedom. There is a kind of double injustice that people with lower social background both have poorer living conditions, low incomes and strenuous jobs and exposed to more disease and early death. Those who are most privileged economic, does also have the best health (Dahl, Bergsli, & Van der Wel, 2014). There has been a decline in mortality and life expectancy for those with education beyond compulsory schooling and those with incomes above the average since the 1970s. However, mortality has changed little among groups with low education, low income and among singles (Næss, Rognerud, & Strand, 2007). Several models are used to explain social inequalities in health. From Marmot (2004) and his psychosocial theory, where stress is the root of inequalities to the controversial hypothesis to the English professor in social epidemiology Richard Wilkinson, who believe that social inequalities are harmful in themselves (Wilkinson, 1992).

The government have realized the importance to focus on social inequalities in health. Changes to reduce social inequalities were embodied in the national strategy in Report NO.20 to the Storting, (2007). The welfare state has a key role to play in the job to ensure that everyone gets equal access to the health services. This in turn may involve difficult, challenging and important political choices (Ministry of Health and Care Services, 2007).

Prenatal care is a free service to all pregnant women, based on recommendations from World Health Organization (Norwegian Directorate of Health, 2005). This offer contributes to reducing social inequalities in health. It emphasis facilitating conditions so everyone receive necessary and entitled assistance. Separate guidelines are made to help health professionals to meet the requirement of professional responsibility in legislation. In Norway women with low-risk pregnancy are free to choose between a midwife and a general practitioner (GP) for pregnancy check-ups (Norwegian Directorate of Health, 2005).

Norway is a multicultural country. According to the report; Kommunenes helsefremmende og forebyggende arbeid i Helsestasjons- og skolehelsetjenesten (Municipalities health promotion and prevention in health clinics and school health (Norwegian Directorate of Health, 2004), the local Health Centre is supposed to be a social equalizing factor. The goal is to cover the health education and health promotion for all groups in the population.

## 1.5 Purpose of the project

By preparing, distributing and collecting responses from pregnant women, the aim is to investigate whether there is a relationship between the SOC and participation in free offer of exercise for pregnant women. Age, education, ethnical background, marital status and former birth among pregnant women will also be investigated in context of the SOC and participation of the free offer of exercise. It is also a way to try to falsify if Antonovskys hypothesis that a higher level of SOC correlates with physical health (Antonovsky, 1979), like the level of physical activity.

This project may contribute with some numbers about the free offer of exercise, which may be of importance when the politicians decides whether the municipality are going to spend money on these kind of free offers. This is a low threshold that is meant to achieve everyone, regardless of for example degree of SOC and level of physical activity. The result may give a better understanding of who actually uses the free offer, which can help the organizers, in

this case “Frisklivssentralen” to provide better service. It could also supply further evidence of the importance of using SOC in research investigating physical activity among pregnant women.

Many studies have investigated physical activity together with pregnancy (Duncombe, Wertheim, Skouteris, Paxton, & Kelly, 2009; Downs & Hausenblas, 2003; Cioffi, Schmied, Mills, Thornton, Duff et al. 2010; Gaston & Cramp, 2010; Gjestland, Bø, Owe, & Eberhard-Gran, 2012; Guardino & Schetter, 2013; Fredriksen, Moland, & Sundby, 2008; Clarke, Gross, & Psychol, 2004). A consistently comment at the end of these research articles, are the need for future research and intervention aimed at increasing the level of physical activity among pregnant women. There is an especially need for looking more closely into the association between physical and psychological aspects. SOC is seen as a beneficial way to identify vulnerable women in need of increased support during pregnancy (Sjøstrøm, Langius- Ekløf & Hjertberg, 2004). Since there is no research on SOC, physical activity and pregnancy from before, this project may help to fill a gap in the research. SOC is according to the review from Eriksson & Lindstrøm (2006) not the same as health, but an important disposition to the development and maintenance of people’s health. Regarding to this, salutogenic approach could be the theoretical foundation to the health promotion research.

## 1.6 Research questions:

**Main question**: Is there any association between the pregnant women´s Sense of Coherence and participation in the free offer of exercise?

**Secondary question**: Does age, education, marital status, ethnic background, weeks of pregnancy, former birth and level of physical activity have any associations with the Sense of Coherence among the pregnant women and the participation of the free offer of exercise for pregnant women?

# 2. Theoretical framework

This chapter provides an introduction to the theory of Salutogenesis as a theory to guide health promotion, and the core of this project and the main concept of the Salutogenesis: Sense of Coherence.

## 2.1 Salutogenesis

Salutogenesis is hypothesised as a flexible and adaptive orientation to view the world (Eriksson, 2007).

The Jewish sociologist Aaron Antonovsky, born in 1923 developed the salutogenic model of stress and resistance with a central construct, named the Sense of Coherence (SOC). Salutogenesis focuses on what brings good health, as opposed to pathogenesis that focuses on what causes disease. The salutogenic approach focuses on how the individual person is on a continuum. Explained as an axis which runs between the absolute disease (dis-ease) and complete healthiness (ease) and how persons shall move towards the end that provides good health (ease) (Antonovsky, 1997).

Dis-ease ---------- Ease

Extended explained; a person is not either sick or healthy, as in the dichotomy pathogenesis. The salutogenic approach allows a person to be healthy and sick at the same time, but constantly looking for factors that contribute into the right direction on the axis of continuum, towards good health (Antonovsky, 1997).

### 2.1.1 The salutogenic model as a theory to guide health promotion

Salutogenic framework in context of the important work of health promotion has to be seen in relation to the highly influential and constant point of reference, The Ottawa Charter for health Promotion (World Health Organization, 1986). This is where people are becoming

active participating subjects in their own life and the professional's role is to support and provide options to enable people to take own decisions. Equity, participation and empowerment are central values, like in the philosophy of Salutogenesis. Health promotion is a cultural, social, environmental, economic and politic process. The upstream thinking, where people "learns to swim", strengthens peoples health potential in the spirit of the salutogenic view. The way people are able to perceive structures, create coherence and keep everything together has a central impact on health (Eriksson & Lindstrøm, 2008).

### 2.1.2 Sense of Coherence (SOC)

Antonovsky (1997) focuses on factors that could describe the ability to manage tension in life. These factors were first described as GRR (Generalized resistance recourses). These were defined as money, ego strength, cultural stability and social support. In the lack of order to describe his idea completely, he developed the concept of Sense of Coherence (Antonovsky, 1997). Development of a person´s SOC is mainly a process formed during adolescence. SOC is considered to be fairly stable above the age of 30, and can only be changed if something dramatic happens (Antonovsky, 1997). According to Antonovsky (1997), pregnancy might be one of these dramatic happenings, the "life event stressor" that we do not have the automatic response to. The level of SOC might affect the way the woman handle pregnancy and its challenges. Antonovsky suggested SOC to be a major predictor of health as coherence between life inside and the world outside (Antonovsky, 1979).

SOC is the person's ability to comprehend the whole situation and to utilize the capacity of the available resources. Sense of Coherence may explain why people in stressful situations stay well and additionally has the capacity to improve health (Eriksson, 2007).

Sense of coherence (SOC) is defined as:

> A global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that 1) the stimuli deriving from one´s internal and external environments in the course of living are structured, predictable and explicable, 2) the recourses are available to one to meet the demands posed by these stimuli; and 3) these demands are challenges, worthy of investment and engagement (Antonovsky, 1987 p.107).

People with a strong SOC have a general confidence that their resources are available to meet demands, posted by stressful situations. They will consider a stressor more like a challenge than as a threat, while people with weak SOC will have trouble finding solutions in stressful situations and get stuck in the difficult situation (Antonovsky, 1997).

According to Antonovskys theory; childhood conditions, in terms of the social position, economic condition and social relation in the family, as well as the class position in the adulthood is of importance for the formation of the SOC (Antonovsky, 1997). Antonovsky claims that SOC are largely stable in the adulthood, but those with strong SOC have greater chance to maintain their strong SOC, while those with weak SOC are most likely to experience decreasing levels of SOC (Antonovsky, 1997).

Hence, Antonovsky believes it is inexpedient to talk about SOC within a strong time-limited group, especially when the background for group composition is unstable. In a group of these assumptions, it is most important to concentrate on each individual's SOC and rather look at the influence they have among each other (Antonovsky, 1997).

SOC tends to increase with age. It is possible to have a strong SOC and at the same time have problems seeing the entire world as coherent. Antonovsky explain this as we all have boundaries, and what is beyond these boundaries does not matter to us, whether it is comprehensible, manageable or meaningful (Antonovsky, 1997).

SOC is based on three important components: Comprehensibility, manageability and meaningfulness.

C= Comprehensibility

Comprehensibility is the core and cognitive component of the SOC. It says something about how a person perceives the stimuli they are confronted with, whether it is in the interior or exterior environment. This could be perceived as arranged, coherent, structured and clear or the opposite intelligibility as chaotic, disordered, random and inexplicable (Antonovsky, 1997).

MA= Manageability

Manageability is the action component of SOC. It is about having resources available controlled by yourself or available through others. Resources could be a good friend, spouse, religion or other that one has a trustful relationship with. By taking advantage of these, one can meet the requirements and challenges encountered in life. This helps you understand and determine how to handle the situation (Antonovsky, 1997).

ME= Meaningfulness

Meaningfulness is the motivational component of the SOC. Antonovsky predicts a clear connection between strong mental health and commitment to activities that matters to the individual. The meaningfulness- component is formally based on the extent to which one knows that what one accomplishes and experience in life gives a meaning (Antonovsky, 1997).

# 3. Previous research

This chapter describes method for literature search and findings from previous research, which are relevant to illuminate the research question of the study. The chapter leads into a summary included a presentation of the gap in the research.

## 3.1 Literature search strategy

PICO form was used to develop search strategies. PICO form is an English acronym, being used to help pinpoint current research related to topical issue consisting (Kirkehei & Ormstad, 2013):

P (Population)= Pregnant women

I (Intervention) = Free offer of exercise

C (Comparison) = Sense of Coherence

O (Outcome) = Associations between physical activity/ use of the free offer of exercise and Sense of Coherence.

Based on PICO, the literature search was done mainly in Google scholar and Oria, which automatically directs you to the appropriate pages. The searches were repeated frequently, to ensure that the latest research were included

It was taken advantage of using following websites:

www.helsedirektoratet.no

www.regjeringen.no

www.ssb.no

www.lovdata.no

www.folkehelseinstituttet.no

www.forskning.no

Key term: Sense of Coherence and pregnant women, Sense of Coherence and physical activity, Salutogenesis, Pregnant women and/or physical activity

## 3.2 Sense of Coherence and pregnancy.

It is difficult to find studies that have investigated SOC together with physical activity during pregnancy. Most of the research on SOC and pregnancy is about the psychological factors, like coping, stress reactions and well-being. The results of the study from Sjøstrøm et al. (2004) demonstrates that the higher the feeling of SOC in life of pregnant women, the better well-being in general. This study was completed by 120 Swedish pregnant women, with the aim to describe perception of well being during pregnancy and after delivery in relationship with their SOC. The same study found lower level of anxiety and predisposition to depression for those pregnant women on the scale of high SOC (Sjøstrøm et al., 2004). A research done in Japan, with 54 pregnant women that participated in a questionnaire survey, investigated the relationship between stress-coping capabilities of women in the final stage of pregnancy and their postpartum stress reactions (Sekizuka, Nakamura, Shimada, Tabuchi, Kameda & Sakai, 2006). They found that stress reactions were more intense for women with weak SOC. They did also find a relationship between weak SOC during pregnancy and depressive tendency.

The level of SOC may be crucial to how the pregnant women experiences and copes with pregnancy. Pregnancy may according to Antonovsky be a “life event stressor”, an event we do not have automatic response to (Antonovsky, 1979). How a woman cope with this situation is considered to have an impact on health and wellbeing (Sjøstrøm et al., 2004). According to Ngai & Ngu (2013) were physiological changes that occurred during pregnancy, likely to contribute to a decline in physical health status among pregnant women. Childbirth can be stressful and challenging especially for those with low SOC (Takegata, Haruna, Matsuzaki, Shiraishi, Okano & Severinsson, 2014). In the study from Takegata et al. (2014) were 246 healthy Japanese pregnant women was recruited, the aim was to look at the relation between atenatal fear of childbirth and SOC. Pregnancy and upcoming childbirth are generally recognized as a happy and positive event, like in the study from Aune, Torvik, Selboe, Skogsås, Persen, & Dahlberg, (2015). They interviewed twelve Norwegian healthy nulliparous pregnant women in order to gain a deeper understanding of the women internal

and environmental factors that are important for a normal birth and positive birth experience. According to Antonovskys theory (1979) does pregnant women with strong SOC understand and handle the new life situation as non-stressful (comprehensible), they believe that they have the necessary resources available to find solutions to the actual demands of the pregnancy (manageable) and experience challenges during pregnancy as worthy of investment and motivational (meaningfulness). Women with strong SOC are more likely to check out information about ways to exercise safely, so they may continue to be physically active with adaptation (Antonovsky, 1997). Research shows that if pregnant women are attending courses and information meetings related to pregnancy and coping, it contributes to a better SOC (Thorsen, 2009).

SOC scale may be according to Sjøstøm et al. (2004) a beneficial way to identify vulnerable women in need of increased support during pregnancy. The same study shows that pregnancy does not affect the level of SOC. Geyer (1997) asks question of the stability of SOC in his paper, where he discusses several aspects in line with the SOC literature that already exist. Antonovsky claims it will be stable at the age around 30 and only changed by dramatic life changes. While Geyer (1997) argues that there may be changes in work and home, not necessary of dramatic character that may still have a great impact on SOC.

### 3.3 Sense of Coherence and Physical activity

Antonovsky predicts it is a strong relationship between the concept Sense of Coherence (SOC) and physical health (Antonovsky, 1979). The SOC appears to be strongly associated with perceived good health, at least among people scoring high on SOC. Frequent physical activity is also associated with strong SOC emphasized by Kuuppelomaki & Utriainen (2003). This study followed 287 Finnish students during a period of three year, with data collected by a questionnaire. A population study from Finland (Hassmen, Koivula, & Uutela, 2000) with 3403 participants, both women and men, showed significant correlation between those who exercised more frequently and high SOC. It also shows that those who exercise less frequently possessed lower SOC. A longitudinal study on Japanese students shows the same, but adds simultaneously a correlation between high SOC and stronger interest in learning (Togari et al. 2008). Another study from Netherland shows that those with a strong SOC are often more engaged in sports and have lower average blood pressure (Super, Verchuren, Zantinge, Wagemakers & Picavet, 2014). This study was a postal questionnaire

among Dutch men and women from 20- 65 years, which had participated in a health examination 6 months to 3 years earlier. In total 12 024 people completed the questionnaire. Strong SOC is associated with higher education, higher self esteem, higher feeling of good control of life and general more positive to changes in life (Pallant & Lae, 2002). These are results from a completed questionnaire from 439 Australian adults from 18 to 82 years. Meanwhile, a study done in UK that included 10 424 women and 7863 men, indicated similar results. Those with strong SOC were less likely to smoke cigarettes and less likely to be physically inactive, but that was independently of social class and education. This aim of this cross-sectional study was to test the hypothesis about SOC is associated with healthier lifestyle choices independently of social class and education (Wainwright et al. 2008).

The relation between SOC and physical health seems to be more complex than the mental dimensions; SOC and physical health seems to be a bit weaker, than the relation with SOC and mental health (Eriksson, 2007). Physical health includes different aspects like physical activity, nutrition and diet, alcohol and drugs, medical self care and rest and sleep (Nash, 2010). Allison, Adlaf, Lalomiteanu & Rehm (1999) investigated predictors of health risk behaviours among young adults. Based on interview with 1395 Canadian young adults, from the National Population Health Survey, SOC did not show any association with physical activity. The review from (Flensborg-Madsen et al., 2005a) which investigated more than 50 scientific publications concerning the association between SOC and different aspects of health, showed that the SOC scale was primarily correlated with psychological aspects. SOC scale in use together with physical health showed little or almost no correlation. The main reason for this weak correlation might be according to Flensborg-Madsen, Ventegodt & Merrick (2005b) the different questions in the SOC questionnaire. Flensborg- Madsen et al. (2005a; 2005b) believe that the questions are both of a mental and an emotional nature. The emotional part is what primarily determines physical health, and not the mental part. The review from Eriksson & Lindstrøm (2006) suggests that the relationship between SOC and physical health seems to be weaker than the relationship with mental health. The review from Eriksson & Lindstøm (2006) includes 458 scientific publications, with the aim to synthesise empirical findings on the SOC and examine the capacity to explain health. Different studies indicates that a strong SOC is even associated with lower mortality risk (Super et al. 2014), lower incidence of diabetes (Kouvonen, Vaananen, Woods, Heponiemi, Koskinen, & Toppinen-Tanner, 2008) and delay of the onset of cancer (Poppius, Virkkunen, Hakama & Tenkaneen 2006), these are studies on health connected to physical inactivity

(Norwegian Directorate of Health, 2014), but they says nothing directly about physical activity and SOC.

## 3.4 Physical activity and pregnancy

Few pregnant women meet the recommended level of physical activity. These statements comes from the study from Gjestland et al. (2012), which showed that only 14,6% of the 3282 Norwegian pregnant women that was included in the study, followed the current exercise prescription for exercise during pregnancy. This was a cohort study, were data was collected by a questionnaire in pregnancy week 17-21, 32 and birth. The main purpose was to describe the exercise level in mid-pregnancy in association with sociodemographic variables. Pregnancy is viewed as a normal condition, but also an uncertain process that on the one hand motivates and provides the option of a "new start", and on the other hand identifies a perception of uncertainty and danger. This is confirmed by the study of Fredriksen et al. (2008). The study was drawn on interviews, Internet discussions, newspapers and health information booklets, with the aim to explore expectations and experiences among women related to work-life and pregnancy health. In Western societies, the understanding of pregnancy has largely been characterized by biomedical understanding of the body. The body is understood as purely biological, and the focus is directed towards the body anatomy, physiology and pathology independent from individual subjectivity (Ravn, 2004). The main focus is often characterized by measurements like different scale, whether the pregnant women are health or sick, if the situation are normal or abnormal all detached from the women's intentions, understandings and choices of action (Ravn, 2004). Health professionals in prenatal care have a unique opportunity to inform the pregnant women about healthy lifestyle choices (Vedøy & Lie, 2014).

Physical activity during pregnancy reduces the risk of gestational diabetes (Dempsey, et al., 2004) and preeclampsia (Sorenensen et al., 2003). Physical activity and pregnancy are also associated with increased well-being, self-esteem, fewer depressive symptoms, shorter duration of labour and higher prevalence of vaginal delivery (Gjestland et al., 2012). Nutrition and physical activity factors are factors associated with weight related outcomes in pregnancy. Children of obese parents are also more likely to become obese adults. These statements come from a study done with 58 Australian healthy and overweight pregnant women. The aim was by measuring height and weight and completing a self- administered

semi-quantitative survey to describe their knowledge and receipt of health professionals' advice early in pregnancy. The healthy recommendations were not being met, especially among the obese women (Jersey, Nicholson, Callaway & Daniels, 2013). This research are also being confirmed by Gjestland et al. (2012), which shows that more than one third of women gain too much weight during pregnancy. A study performed by Ruiz et al. (2013) shows that training with supervision of professionals may also help to prevent excessive weight gain during pregnancy, especially in normal weight women. This information was detected in an exercise- based intervention, with a total of 962 healthy pregnant women included.

A longitudinal, population- based descriptive study from Dørheim et al. (2012), were 2918 pregnant women were included showed a strong association between sick leave during pregnancy and not being physical active. The same study showed that by week 32 of gestation, 63% of pregnant women were on sick leave. Reduced sick leave gives a tremendous gain for both society and the pregnant women, as work provides health. It also says something about a person's identity, interest and the ability cope (Idebanken, 2012).

The review of existing research on pregnancy and physical activity from Gaston & Cramp (2010) tells that pregnancy entails major changes both physically and mentally. The limitations in physical and social functioning are increasing as pregnancy is progressed. The most reported common reasons why women are sedative during pregnancy are physical limitations, tiredness, lack of social support and time limit (Gaston & Cramp, 2010). Physical activity is mentioned to be an aid for pregnant women to cope with the bodily changes during pregnancy in a study from Cioffi, et al., (2010). This was a qualitative descriptive study with interviews with 19 pregnant women, interviewed at different stages in their pregnancy. According to Duncombe et al. (2009) does safety beliefs impact women and their level of physical activity. Women with minor knowledge about pregnancy and physical activity reported that physical activity could be dangerous and were thus less active. Hagger, Chatzisarantis & Biddle (2002) examined relations between behaviour and physical activity in their Meta- analytic review from 72 studies. The review pointed out the close relationship between already established patterns of physical behaviours prior pregnancy, as a predictor to continue physical activity. Swimming is widely known as one of the safest forms of exercise during pregnancy (Katz, 2003). Swimming is the only form of activities found to increase during pregnancy (Owe et al., 2009).

There are some potential risk factors associated with strenuous exercise during pregnancy (Norwegian Directorate of Health, 2014) like fetal hyperthermia, hypoxia, growth restrictions due to insufficient nutrition and pregnancy loss (Artal & O´Toole, 2003). In a study about physical exercise during pregnancy and the risk of miscarriage in early pregnancy, there was found an increased risk of miscarriage for those women who exercised more than 7 hours weekly and specially for high impact exercise (Madsen, et al., 2007). Too much exercise and adherence of the fitness trend seems to become normal challenges in to day's society (Westerveld & Knapstad, 2014). Social media presents success stories related to high capacity and how pregnant women are dieting during the pregnancy (Dommerud, 2014), which may lead to the pregnant women compromising their own health (Fredriksen et al., 2010).

Knowledge is considered to be a core determinant for behaviour change (Bandura, 2004). Midwives are a key professional group to assist women with concerns to nutrition and physical activity, but the professionals is challenged by contemporary workforce issues (Basu, Kennedy, Tocque & Jones, 2014). Studies (Jersey et al. 2013; Clarke et al. 2004) show that women at the antenatal service are not meeting information and recommendations about physical exercise and nutrition. It is also different how well the pregnant women understand and deal with the recommendations from their GP, midwife or/ information from the authorities (Evenson & Bradley, 2010). Some pregnant women even feel that they have limited opportunities to discuss physical activity and nutrition with their midwife (Jersey et al., 2013). The pregnant women are likely to express a need for more information on diet and physical activity, as well as the emotional support (Vedøy & Lie, 2014). The prenatal care is a unique opportunity for health professionals to inform the pregnant women about healthy lifestyle choices. The attendance in prenatal care is shown to be almost 100 % (Bendiksen, 2010b).

## 3.5 Social inequalities in health among pregnant women

Social inequalities in health are relatively well documented both nationally and internationally. When it comes to the use of health services, surveys from Statistics Norway (Jensen, 2009) shows that it varies especially by education, but also partly income and socioeconomic status. Movement upward on the social ladder gives a raise in health as health increases with every step (Norwegian Institute of Public Health, 2014).

The latest research from Sintef (Tønseth, 2015) shows that those with low education are less satisfied with Norwegian health care, than those with higher education. 2700 people completed a questionnaire, in cooperation with the association for heart and lung patients. The same survey confirms that there is a correlation between low education and poor health. According to the Commission for Social Determinants of Health, created by WHO (World Health Organization, 2013) in 2005, there are several concrete examples to promote the equalization of health differences. All phases of life are essential when it comes to the importance of social inequality in health. When it comes to the pregnant women; every mother should have access to quality assured health care, regardless of ability to pay. Communities should ensure access to basic goods, like health services. These are essential measures to achieve equitable distribution of health (World Health Organization, 2009). Information from the STORK Groruddalen research programme (Jenum et al., 2010), showed that the use of trained midwives that were familiar with the prepared translated questionnaire reduced the barriers to include women with other nationality. This was confirmed by a high inclusion and participation rate in the programme.

Smoking, physical activity, dietary habits, cholesterol, alcohol consumption, blood pressure and high BMI are all well known risk factors of great importance for social inequalities in health (Næss, Rognerud, & Strand, 2007). Data from the Norwegian health (Statistics Norway, 2013) suggest that smoking, physical inactivity, overweight / obesity and diabetes are strongly socially skewed. A study from Spain (Villabi, Salvador, Cano-Serral, Rodrigez-Sans & Borrell, 2007) were 2295 pregnant women was included in a individual based cross-sectional study, showed that women with higher education was less likely to smoke, and more likely to quit smoking when they got pregnant, than those with lower education. Health-related behaviours are influenced by knowledge about risk and how one perceives consequences, stress and coping strategies and mental health. Norms, rules and actual behaviour in the social environment and the community play an important role. Evidence indicates that the unequal social distribution of these determinants is important underlying causes of the relationship between living conditions and health-related behaviours in Norway (Næss, Rognerud, & Strand, 2007). Data from the nationality representative UK millennium cohort study in UK, were 16 157 infants were included, showed that low- socio economic status was associated with adverse pregnancy outcomes for mother and child (Kelly, Panico, Bartley, Marmot, Nazroo & Sacker, 2009).

Statistics show that a lower proportion of immigrants than the general population visited their general practitioner in 2010 (Lunde & Kjelvik, 2012). The structure of health care, and other parts of the Norwegian welfare state is often little known to immigrants. Many immigrants do not have the knowledge on how and where to seek help and what it is possible to get help with. The cause of lack of knowledge and integration in the Norwegian health care may depend partly on residence, perceived information, communication, country of origin, the cause of migration and language skills (Lunde & Kjelvik, 2012). A retrospective study from Saastad, Vangen & Frøen (2007) tells that non-western women is in a risk group for sub-optimal care factors in stillbirths, because of the language barrier, and that health professionals fail to use interpreters (Saastad et al., 2007).

## 3.6 Summary including the gap in the research

Antonovsky predicts there is a strong relationship between the concept Sense of Coherence (SOC) and physical health. Women with strong Sense of Coherence are more likely to understand, cope with challenges during pregnancy. There is also research showing that women with strong SOC are more likely to check out information about ways to exercise safely, so they may continue to be physically active with adaptation. On the basis of all the listed advantages by being physically active during pregnancy, still very few pregnant women meet the recommendations of physical activity during pregnancy. Midwives play an active role to inform the pregnant women about healthy lifestyles, but studies shows that this recommendation are not always being met in the prenatal care.

The SOC appears to be strongly associated with perceived good health, at least among people scoring high on SOC. But the relation between SOC and physical health is more complex than the mental dimensions; it also may seem to be a bit weaker than the relation with mental health.

Frequent physical activity is associated with strong SOC. However, there are few studies who investigates the association between physical exercise and SOC in further dimensions like small number of subjects and focus on specific groups, like pregnant women. Considering the low prevalence in physical activity among the pregnant women, more research and interventions aimed to increase the level of physical activity during pregnancy is warranted (Haakstad, Voldner Henriksen, & Bø, 2007; Downs & Hausenblas, 2003).

# 4. Methodology and methods

To answer the research question, the starting point for the project is already given theory and previous research. The approach will be deductive and the method will be quantitative. Deductive approach means transitioning from the general to the particular, and are the most common used method in social research (Ringdal, 2007). One of the benefits of this approach is that theories are thoroughly discussed and put into a given context, but on the other hand it gives less flexibility during the process. The background for the research question in this study is Antonovskys already given theory about the strong relationship between SOC and physical health (Antonovsky, 1979). Although we cannot prove that a theory is true, we can according to Karl Popper R (Ringdal, 2007) reject theories that are wrong, if they do not correspond with observations from reality.

The overarching study design will be a case study. The "case" in this study will be the pregnant women who visit the midwife and/or participate in the free offer, and voluntarily want to participate in this research project. Case studies are often associated with qualitative designs, but according to Bryman (2012), that identification is not appropriate. This is a special study, with data from a little group pregnant women from an urban area in Norway. It is little chance to generalize the result; but on the other hand it might give some answers to the free offer that might be of interest. There are also similar offers other places in the country, so it may be representative for others.

## 4.1 Choice of method and the methods strengths and weaknesses:

The method for collecting data to answer the research question will be quantitative, as it emphasizes quantification in the collection and analysis of data and to test for relationship between variables (Bryman, 2012). This method is characterized by the control of the researcher who define the questions and possible answers that are of interest in relation to the research question, which makes the actual processing of data much easier than qualitative research (Holme & Solvang, 1996). The main purpose of the quantitative method is to draw a conclusion from a small group to an entire population. Which on the other hand impairs the individualistic perspective and weakens the individual's role in a social context (Ringdal, 2007).

Development of measuring instrument plays a central role in the work of the data collection of the quantitative study (Ringdal, 2007). The data are hard and reliable, and it will not give any deep answers about the pregnant women subjective feelings about the questions. The data collection is characterized by selectivity and distance to the respondents, in order to make appropriate comparisons and formal analysis to reach the results applicable to all pregnant women who are being studied (Bryman, 2012). Questions about SOC are very personal, so it may be easier to answer it by questionnaires, than in an interview. Statistical methods play a central role in the analysis of the collected data (Bryman, 2012). In terms of representativeness, it is important to be aware that the respondents may vary on how they perceive the study and survey. The comprehension of reality among the questionnaire may also vary depending on the level of education, occupation and how many weeks pregnant and whether they have children from before. It is important not to add even more information in the data that has been collected (Holme & Solvang, 1996). Quantitative research with its questionnaires and structure is easier to replicate and that is an important quality of research (Bryman, 2012). A disadvantage is that questionnaire is prepared in an early phase of the project and it is not possible to change questions along the way (Bryman, 2012).

## 4.2 Sample, collection and anonymity of data:

This section gives an overview over the sample, how the primary data were collected and how the data has been stored.

### 4.2.1 Sample

The inclusion criteria in this study were volunteers' pregnant women visiting the midwife at local Health Centre and pregnant women participating in the free offer of exercise. Every pregnant woman got the invite to respond to the questionnaire and the study had no exclusionary criteria. The reason there was no exclusion criteria was to include as many participants as possible and to make the selection easier for the midwives. This choice can be justified by the fact that the project is of a voluntary nature.

There are on average 200 births each year in the municipality where the study was conducted (Kommuneprofilen, 2015). Considering relatively short inclusion time during this study,

from January 2015 until March 2015, the goal was to include 50 respondents, with the intention of getting a representative sample (Bryman, 2012).

### 4.2.2 Collection of data

The pregnant women received the questionnaire from the midwives at the local Health Centre and by the researcher participating on several trainings at the free offer. The pregnant women were given short oral information when they received the questionnaire, together with information letter, the consent to participate (attachment: 3) and an already stamped envelope. The responses were sent to University College of Hedmark, marked the named of the research supervisor, Giovanna Calogiuri. The positive about handing out questionnaire this way was that they could choose where they wanted to answer the questionnaire. They were offered to sit down at the Heath Centre to fill out the questionnaire. The weakness is a risk that there may be some other than themselves who answer the questions, or they delaying to answer (Bryman, 2012). The data were structured before it was collected, which made it difficult to get additional information. It is very important to prepare the questionnaire in advance according to the research question (Bryman, 2012). The fact that it was used self-completion questionnaire impact from a potential interviewer was avoided. Because the way the interviewer read the question, might affect the answer the respondent gives. On the other hand the respondents may avoid answering questions, of reasons that they do not understand the question or do not want to answer a certain question, which leads us to the missing data (Bryman, 2012). If the respondents had any questions about the study or the questionnaires they could find contact information to the researcher, in the information letter.

### 4.2.3 Anonymity of data

The questionnaire was immediately put into a coding system. It is important to document the data collection so others can verify the study (Holme & Solvang, 1996). All the data were stored safely, with a password, in the computer. The envelopes with the questionnaires are kept safely in a closet at the researcher home. The data will be kept safely until the end of the project in case of question or control later. The coding key will be deleted as soon as the research project is finished.

## 4.3 Instruments:

In quantitative methods, measurement and mapping of variables stands out as very important. In empirical research it is also important to judge the validity of the instrument, to ensure that we measure what we think we measure (Bryman, 2012). Large parts of the questionnaire in this study were based on already standardized questionnaires. This may be beneficial in terms of the reliability and validity of the questionnaire. A further advantage is that this opens up for comparisons with other studies (Bryman, 2012). The respondents received the questionnaires in Norwegian language.

It was one questionnaire compounded of three sections (Attachment: 4). The questions in the questionnaire were mostly closed question with a vertical format, which simplified the coding of responses. At the same time it may have forced the respondents into response options that did not suit them (Bryman, 2012).

**Section 1**: Background and question about the pregnant women's intention to participate in the free offer of exercise for pregnant women.

The background questions were based on different control variables, as they were expected to be associated with the research question. The sociodemographic variables are:

**Age:** The average age for giving birth in 2012 was 30,4 years. The average age for giving birth is increasing, and it has significance for the health of both women and child. (Norwegian Institute of Public Health, 2015). The SOC is according to Antonovsky developed mainly during childhood and early adult life, and it is relative stable thereafter (Antonovsk, 1997). Research shows that older people and people with higher education report more often higher SOC (Larsson & Kallenberg, 1996).

This question contains categorical response options. 0= under 18 years old, 1= 18-25, 2=26-35, 3=36-45 and 4=older than 45.

**Education:** Among women in Norway there is 38.7% who has listed high school as the highest education, 26.4% bachelor (involves continuing until 4 years) and 6.9% with master or higher education (Statistics Norway, 2014) Education is a very important determinant of health. Research shows that there are clear distinctions between levels of education and health (Ministry of Health and Care Services, 2007). Numbers from 2009 shows that women with college or university education may expect to live five years longer than those women

with primary school (Steingrimsdottir, et al., 2012). There are studies telling that women with higher education level handles stress and anxiety much better than women with lower level of education (Yali & Lobel, 2010). Other studies points out the clear correlations between level of physical activity and the level of education (Næss et al., 2007; Gjestland, 2012).

This question contains categorical response options. 0= Primary school, 1= High school, 2=Bachelor, 3=Master and 4= Ph.D.

**Marital status:** Studies indicate that married or cohabiting people have consistently better mental and physical health than unmarried/single people. Married and cohabiting couples have fewer financial problems than single and marriage / cohabitation provides social support, which is a protective factor in itself (Mastekaasa, 1993). Social support from family members, friends and health professionals are important recourses and correlates with higher SOC (Ngai & Ngu, 2013). Studies shows that married women are twice as likely to meet the guidelines in exercise compared to single women (Gaston & Cramp, 2010).

This question contains categorical response options. 0= Married, 1= Cohabitant and 2= Single.

**Ethnical background:** When it comes to immigrants and SOC, is the tendency is that fewer immigrants than Norwegian report having good health (Norwegian Institue of Public Health, 2014). A study in from Germany showed that the level of SOC in polish immigrants were significant lower compared to the German norm population (Morawa & Yesim, 2015). In terms of physical activity and ethnical background numbers from health surveys conducted in the period 1994-2003 shows that immigrants from low and middle income countries are far below average physically active. In this case less then 1 hour active per week (Rabanal, Lindman, Selmer, & Aamodt, 2013). There is a limited knowledge to explain the ethnic difference, although this difference may be attributed to religious, cultural, social and environmentally related factors. In general most studies demonstrates that there is an unacceptably higher proportion of the immigrant population being physical active (Abebe, 2010).

This question contains categorical response options. 0= Ethnical Norwegian, 1= other nationality and 2= 2$^{nd}$ generation Norwegian.

**Weeks of pregnancy:** Pregnancy is a time period with physiological, psychosocial and metabolic changes. As the pregnancy progress, studies show there is a decline in the regular exercise (Owe et al., 2009; Duncombe D., et al., 2009). How the pregnant women experiences SOC and degree of physical activity can vary greatly on how far the women have come in pregnancy (Sjøstrøm et al., 2004).

The pregnant woman writes their week of pregnancy at the moment they respond to the questionnaire.

**Former birth:** Women who has given birth to a child/children earlier appear to have higher SOC then those expecting their first child (Sjøstrøm et al. 2004). A study from Haakstad et al. (2007) indicates that practical problems related to children and caregiving at home are given reasons that makes it difficult to be physically active. Studies done by Bellows-Riecken and Rhodes (2008) shows that parenthood are negative correlated to physical activity. Mothers are even less active than the fathers (Bellows-Riecken & Rhodes, 2008).

This question contains categorical options. 0= 0, 1=1 and 2= 2 and more children.

**Intention to participate in the free offer:** The measure of intention to participate in the free offer is based on the widely used theory to understand physical activity, Theory of Planned Behaviour (TBP), developed by Ajzen (1991). This theory is implemented in this study as a part of the understanding of the women's behaviour based on their intention (motivation/plan) to participate or not participate in the free offer. The Intention to engage behaviour is the main predictor and motivation to perform behaviour. The intention is determined by three concepts. First, attitude based on the women positive or negative evaluation to participate in the free offer. Second, subjective norm, is like the perceived social pressure to participate from significant others. Third, perceived behavioural control, which vary between a women perceived ease or difficulty to perform behaviour, in this case attend the free offer of exercise. There are several studies that show clearly correlation between the intention to participate and the participation in physical activity. The study of Downs & Hausenblas (2003) shows that intention and perceived behaviour control had the strongest correlations within exercise behaviour. The Meta analysis of TPB done by Armitage & Conner (2001) concludes that TPB is a predictor of intention and behavior. They provide support for the efficacy of the self- reported behaviour, not so much the observed behaviour. But the TPB can still explain 20 % of the variance in prospective

measures of actual behaviour. There are also studies that show discordance with intention and behaviour. The quantification of the intervention-gap in the study of Rhodes & De Bruijn (2013) shows that only 54% of intenders were successfully performing the intended behaviour.

The pregnant women´s intention to participate in the free offer was measured by a single item scale, consistent with the recommendations of Ajzen (1991) and Downs & Hausenblas, (2003). Like the study about pregnant women´s intention to be physical active, from Downs & Hausenblas, (2003) the single item scale was likert scale, ranged from 0 to 7. The reason why it was a single item scale is the ease of administration, in spite of all the benefits of using multi item scale. This is a Masterthesis and the researcher are no familiar with the use of item scales, so to make the analysis feasible and manageable the single item scale is preferred. Earlier studies on exercise intention and behaviour utilizes single item scales (Hausenblas, Downs, Giacobbi, Tuccitto & Cook, 2008) and some empirical findings indicate that single-item scale measures equally high predictive validity as multi item scales (Diamantopoulos, Sarstedt, Fuchs, Wilczynski, & kaiser, 2012). The intention to participate in the free offer of exercise is measured by a single item scale from 1-7. Where 1 means no intention to participate and 7 means great intentions to participate. This is an important question to include, because maybe some of the women have not participated yet in the offer of different reasons. For example: have just received information about the offer, has been sick, not had time etc. But they are going to participate as soon as they manage.

**Section 2:** Godin Leisure time- physical activity questionnaires (Godin, 2011) was translated to Norwegian and adapted to the research project. This part of the questionnaire is including the main research question whether the pregnant women participate in the free offer of exercise or not.

There are a lot of valuable research and data from the Norwegian population on physical activity. But it lacks on a standardization of good a questionnaire (Kurtze, Gundersen, & Holmen, 2003). This makes it difficult to compare and monitor results over time. In the study from Kurtze et al. (2003) several essential dimensions was mentioned to be important in the questionnaire regarding physical activity. Those were frequency, duration and intensity.  Godin Leisure time- physical activity questionnaire contains these requirements.

Godin Leisure time- physical activity questionnaire has been translated into different languages and is often used to assess self-reports leisure time physical activity among different populations. It is simple and easy to use, and do not require high self-reporting skills. Google scholar shows that it has been cited nearly 1000 times, as an indicator of usefulness (Godin, 2011). The score is expressed in units; the first question gives three latters values correspond to MET. The first question are multiplied with 9 = Strenuous activity, 5= Moderate activity and 3= light activity and the answer are given in METs (Godin, 2011). The second question about the frequency of the level of physical activity during a 7-day period are divided into groups with number 1= Never/rare, 2= Some times and 3= Often. These are ordinal levels.

To answer the main research question there will be a question on whether they have already utilize the free offer of exercise for pregnant women. This is a closed dichotomy question. 0= No and 1= Yes

**Section 3:** SOC 13 questionnaires: Translated to Norwegian based on an already used questionnaire (Eide, 1991).

The original scales are copyrighted and generally free for academic, non -commercial purposes (Center of salutogenesis, n.d). To get permission to use the scale, the director of Centre of salutogenesis Monica Eriksson was contacted. She got information about the study, and gave permission to use SOC 13 item scale (Attachment: 1). It is original and well used wide world. Originally Antonovsky developed the questionnaire to measure SOC consisting 29 items. Later on a shorter form, the SOC- 13 was introduced (Lindstrøm & Eriksson, 2010). Short version tends to achieve better response than longer ones (Bryman, 2012). The calculation will be according to already prepared manual (Eriksson, 2007). The questionnaire consist 13 closed questions, where the answers are derived from the original 7-point likert scale into a 5- point likert scale. On the basis of Mehlums (1998) and (Sairenchi et al. 2011) 5-point likert answers are used at adolescent to increase the response rate. Based on this research the hope is to get as many responses as possible with simplified the response possibilities in this relative small sample size. The maximum score is 65 and the minimum score is 13. The SOC- scale has been used in 32 countries and with at least 33 languages. The SOC-scale is considered to be a recognized and well-used measurement method (Eriksson & Lindsrøm, 2005). Antonovsky never expressed a level of a normal SOC, but numbers of studies (Eriksson, 2007) report divisions into two or three groups like low and

high and low, medium and high, weak, moderate and strong or strong and weak. According to studies from (Ing & Reutter, 2003; Oz et al. 2009) the SOC scores in this study are summed in a total score with higher score indicating strong SOC and lower score indicate weak SOC. The questions in the SOC-13 are divided between the three core concepts; Comprehensibility with 5 questions and variation width from 5-25, Manageability with 4 questions and variation width from 4-20 and Meaningfulness with 4 questions and variation width from 4-20. Antonovsky pointed out that the intention of the SOC questionnaire is to see all the questions in a whole, not split up and examine the three subgroups separately (Eriksson, 2007).

## 4.4 Reliability and validity

This part of the Thesis concerning the reliability and the validity of the questionnaire, which includes the measuring instrument of SOC- 13, Godin Leisure time- physical activity part, and the reliability of the data collection. To determine whether the study is reliable; stability, internal reliability and inter-observer consistently are prominent factors of importance (Bryman, 2012). Reliability says something about the consistency of the measurement instrument used in research (Ringdal, 2007). Stability tells if the measure is stable over time, often checked by using a test-retest method (Bryman, 2012). Which means that the same person with short time intervals will answer the questionnaire, to measure the correlation between the two repeated responses (Ringdal, 2007). It was not used in this study, but based on other studies like the review from Eriksson & Lindstrøm (2005), Person r measured on the SOC-13 scale varies between 0,69-0,72. Person r shows statistical correlation between two variables and the value can range from -1 to 1 (Ringdal, 2007). Eriksson & Lindstrøm concludes that the SOC-scale has got high reliability and can be used as a multicultural instrument into how people cope with stressful situations and prevents health. Godin Leisure time physical activity questionnaire got Person correlations from 0,62- 0,81 (Godin & Shepard, 1985). In a study that was checking for the validity of different physical activity questionnaires (Kowalski, Crocker , & Kowalski, 1997) Godin 1 shows Pearson r from 0,8-0,96. The Godin leisure time questionnaire has been translated in different languages and used to assess leisure-time physical activity among different populations, in different countries (Godin, 2011).

To ensure that all of the used indicators are related to each other, it is important to check the internal reliability. To test the internal reliability can utilize a control method called Cronbachs alpha (Bryman, 2012). Cronbachs alpha may vary from 0 to 1, values above 0.7 are considered to show high reliability. Cronbachs alpha of the SOC-13 in this study was: 0,83. Other studies from Eriksson & Lindstøms review (2005) shows that 127 studies that used the SOC-13 instrument Cronbachs alpha varied between 0,70 – 0,92.

The reliability may be affected by the execution and processing of data collection (Ringdal, 2007). All questionnaires were given a number, with corresponding figures in the matrix, for easier to find back to the correct questionnaire for suspected error. The data was manually registered in SPSS. It was devoted much attention and time to ensure that all data was accurately recorded. Making dot chart in SPSS to help look for errors and missing data also checked this.

Validity means validity where the purpose is to reveal whether the study actually measures what it should measure (Ringdal, 2007). In this project each part of the research problem has got to be operationalized in a context so the data material gives meaning. SOC are operationalized into the three core concepts; comprehensibility, manageability and meaningfulness. Antonovsky (1979) recommend discussing the three concepts in context. This study does in the analysis part differentiate between the three concepts to achieve a broader understanding of SOC and the relationship with physical activity. To assess this study validity, results are compared to relevant prior research. Eriksson & Lindstrøm (2005) shows during their systematic review different results when it comes to whether SOC scales actually correlate with the theoretical construction principles; and they claim SOC to be a multidimensional concept.

How the individual experiences SOC and degree of physical activity can vary greatly on how far the women have come in pregnancy (Sjøstrøm et al., 2004). Godin Leisure time activity questionnaire are not adopted to suit pregnant women, so it may be confusing when the examples of different sports activities are not manageable with pregnancy (Godin & Shepard, 1985). It is about whom these findings can be generalized to, and the best way to ensure that the results can be generalized to a population is to aim for random selection of the overall sample (Ringdal, 2007). In this project there was no exclusion criteria. Every pregnant woman who visited the midwife was random invited to participate. It is very arbitrary who are pregnant during this time of the survey and it is completely random who

answers the questionnaire. Lack of exclusion criteria can be justified by the fact that the project is of a voluntary nature.

## 4.5 Ethical considerations

The respondents were voluntary included in the study. They were informed on the research project and the questionnaire through the midwives and the researcher her self at the place where the free offer take place. They received an information letter and a consent form, which they had to sign if they agreed to participate in the project (Attachment: 3). In the consent form there was information about the volunteering and the opportunity to withdraw from the study to any time. The questionnaires were anonymous, and the respondent got information that the questionnaires were kept confidential and the data would be destroyed after the project is finished. The project was reported to NSD for approval. According to NSD project is not notifiable (Attachment: 2). The assessment was made based on the fact that there will not be processed personal data by electronic means, or created any kind of manually person register containing sensitive personal information. All data processed electronically in connection with project is anonymous.

# 5. Data analysis

This chapter explains the statistical processing of data and analysis. How the study is performed and which variables are used.

## 5.1 Data processing and statistical analysis

The data were statistically analysed with help from Statistical Program for Social Science (SPSS) version 22.0 (Pallant, 2010). A research diary was utilized actively in the progress as a tool to keep good record of what happened during the work of the project.

It was done a descriptive analysis with help from SPSS, to find the distribution of the data (Hellevik, 1999). This was checked by histograms and normality plots. The normal distribution of the data plays a central role in determining the statistical generalization (Ringdal, 2007). This process did also show how many times the different value of a variable occurred and gave the opportunity to detect errors in encoding response or the coding of the data and errors in the data set (Bjørndal & Hofoss, 2004). The work of the data analysis continued by further exploring the data, which involved testing of various analytical methods. The non-parametric technique Chi- Square test for independence was first attempted, since there is a relative small sample size and as most of the control variables are categorical. On the other hand, the research question is about finding association between two variables and the data are fairly normally distributed. The dependent variables in the study are continuous, so the choice of the statistic techniques was Pearson correlation coefficient. Pearson correlation coefficient is a commonly applied parametric test, which tend to be more powerful then the non- parametric techniques like the Chi-square test, as it makes assumptions about the population from which the sample has been drawn (Pallant, 2010). To explore the distribution of the SOC score and the Mets of Godin 1, there was done a t-test for independence. This independent sample test will find out if there is a statistical significant difference in the mean scores, which will give information about the probability that the scores comes from the same population (Pallant, 2010).

To determining the strength of the relationship between the variables guidelines from Cohen (1988) were followed. The size of the value of the correlation coefficient may vary between -1.00 to1.00, which indicates the strength of the relationship. A correlation of 0 indicates no

relationship at all and a correlation of 1.00 indicates a perfect positive correlation. Cohen listed following values together with the strength of correlation:

Small: r=0.10-0.29

Medium= 0.30-0.40

Large: r=0.50-1.00

The negative sign out of the front of the r-value does only refer to the direction of the relationship and not the strength (Pallant, 2010).

In order to define a result to be statistically significant, the significant level was set as p = 0.05, because the 0.05 limit is most commonly used. Value p= 0.05 or less indicates only five percentage or less chance that the relationship is random, which is considered to be a good argument for a statistically significant relationship. Although the significance value shows that there are significant differences between the two variables one can not conclude with certainty that the null hypothesis voices and therefore there exists any correlation between variables (Ringdal, 2007).

## 5.2 Recoding of variables

During the analysis of collected data, it was necessary to recode some variables to better suit the analysis techniques and to get a good overview of the received data.

**Intention to participate:** The numbers changed from 1-7 item scale into three groups. Low= 0-1, medium= 2-5 and high= 6-7. The sample size in the study is relative small, so by gathering more numbers in fewer groups it makes it easier to get rid of outliers and obtain statistically significant result.

**Age:** No respondents in the group 0 and 4, so these groups are removed. The age are no divided into 1= 18-25, 2= 26-35 and 3=36 and older.

**Education:** Very few respondents in the lowest and the highest group, so these are combined together with the closest group. New code is: 1= Primary school and high school, 2= Bachelor, 3= Master and higher education

**Marital status:** The women were either married or cohabitant. The coding are changed into 0= married and 1= Cohabitant.

**Ethnical background:** There were no 2nd generations Norwegian. The coding are changed into 0= Norwegian and 1= other nationality

**Weeks of pregnancy:** The numbers of weeks of pregnancy are divided as a dichotomy variable. 1= until week 25, 2= from week 26. Research shows there is a normal decline in the level of physical activity as the pregnancy progress. Week 25, the end of the second trimester are mention to be a small distinction of this border (Clarke at al., 2004).

**Former birth:** Because of to few respondents in one of the categories, the category of2 children and more was put together with 1 child. The new code is 0= 0 Nulliparaous, 1= Multiparous.

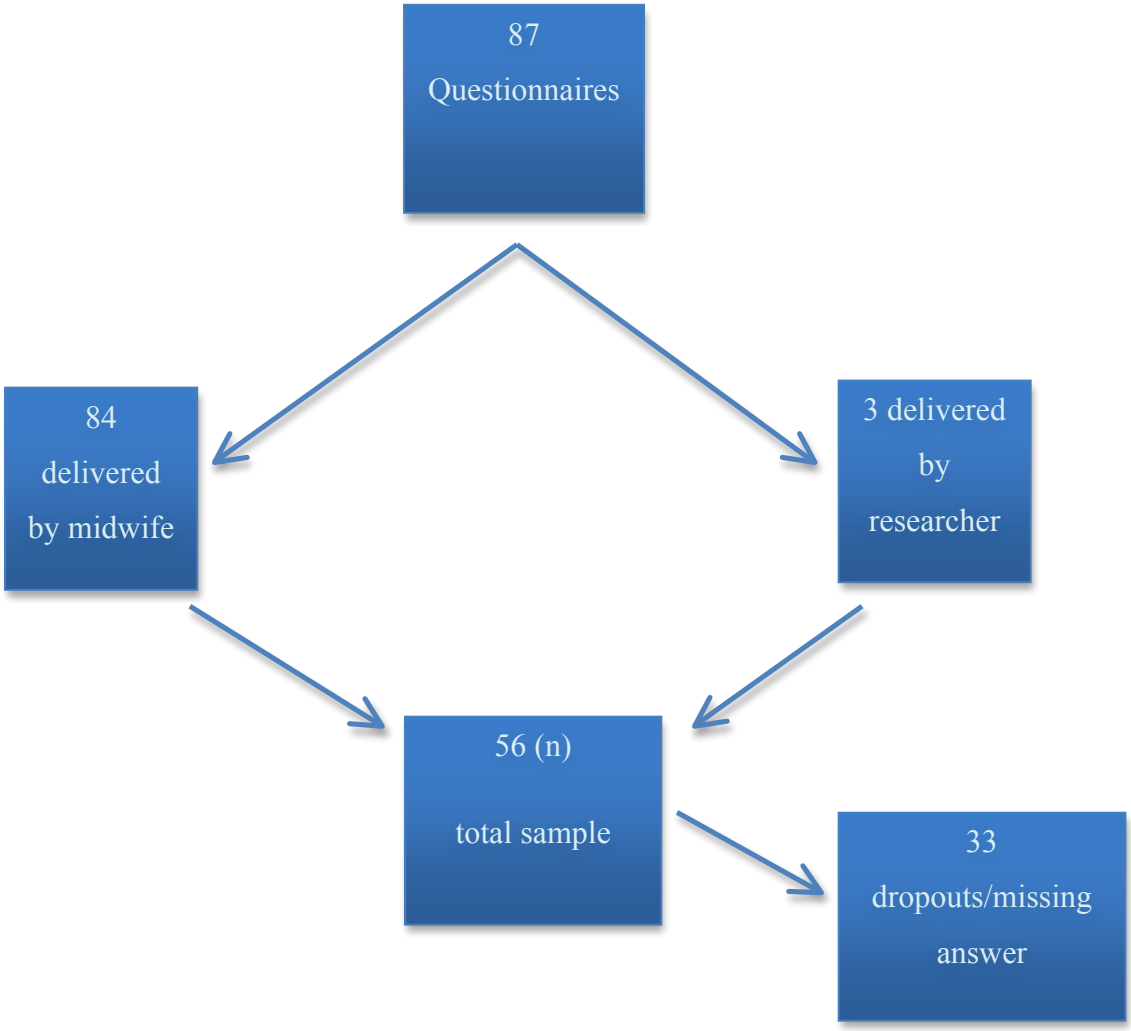
# 6. Results

The following chapter are a description of the result from the analysis that will lead to the answer of the research questions of this Master thesis.

## 6.1 Description of the sample:

It was delivered a total of 87 surveys in this study. Midwives at the local Health Centre accounted for the biggest part, handing out 84 questionnaires. 3 were delivered at the free offer of exercise by the researcher. The reason why so few questionnaires were delivered out at the free offer, was that most of those who attended the free exercise for pregnant women had already been asked to attend by the midwife at the local Health Centre. In total, 56 pregnant women responded with written consent to participate and answered all the questions in the questionnaires. 33 answers were dropout/missing. This gives a response rate to 64,4 %. Which is a quite good response rate. It is a familiar challenge to get high response rate by self-completed questionnaire, 50 % dropout is common in a general sample (Ringdal, 2007).

**Figure 2: Schematic flow diagram of the sample and dropouts/ missing answer.**




### 6.1.1 Demographic information about the sample

An overview of the description of the sample is presented in Table 1. Categorical numbers in the table are given with both numbers and percentage, as variables with less than 20 units are not recommended reported in percentage alone (Johannessen, Tufte, & Christoffersen, 2010).

**Table 2: Descriptive data of the sample of pregnant women (Total n= 56). Presented with frequency and percentage of each group. The table also includes the mean value and +/- SD (standard deviations).**

| **Variables** | **N (%)** | **SOC**<br>Mean +/- SD | **Godin1**<br>Mean +/- SD |
|---|---|---|---|
| **Age** | | | |
| 18-25 | 10 (17.9) | 46.40 +/-4.502 | 27.40 +/-14.630 |
| 26-35 | 41 (73.2) | 49.39 +/-5.314 | 25.05 +/-15.387 |
| 36 and older | 45 (8.9) | 50.60 +/-4.615 | 24.40 +/-17.771 |
| **Education** | | | |
| Primary/ high school | 18 (32.1) | 47.72 +/-4.787 | 24.22 +/-14.132 |
| Bachelor | 26 (46.4) | 49.42 +/-5.085 | 26.19 +/-14.599 |
| Master and higher | 12 (21.4) | 48.83 +/-6.073 | 25.50 +/-18.938 |
| **Marital status** | | | |
| Married | 16(28.6) | 49.06 +/-4.464 | 27.19 +/-14.256 |
| Cohabitant | 40 (71.4) | 48.93 +/-5.512 | 24.70 +/-15.681 |
| **Ethnical background** | | | |
| Norwegian | 51 (91.1) | 49.12 +/-5.275 | 26.55 +/-15.254 |
| Other nationality | 5 (8.9) | 47.40 +/-4.450 | 13.80 +/-9.149 |
| **Weeks of pregnancy** | | | |
| Before/until week 25 | 22 (39.3) | 48.70 +/-4.856 | 28.96 +/-15.131 |
| After week 26 | 34 (60.7) | 49.15 +/-5.484 | 22.94 +/-2.608 |
| **Former birth** | | | |
| 0 Children | 30 (53.6) | 47.67 +/-5.168 | 28.67 +/-15.608 |
| 1 children or more | 26 (46.4) | 50.46 +/-4.901 | 21.65 +/-14.085 |

It was clear majority in the age group between 25-35 (73,2%) who responded to the questionnaires. Most of the pregnant women were in the bachelor group of level of education (46,4%), cohabitants (71,4%) and with Norwegian ethnical background (91,1%). There was a slightly overweight of women pregnant in week 26 and later (58,9%) and most of them were nulliparous (53,6%). The mean value of SOC of the whole sample was 48,96. The minimum score was 39 and the maximum score was 59.

### 6.1.2 Demographic information about the sample and the Sense of Coherence:

The level of SOC did not have the large variations between the different groups of variables, which will be further explained later in the chapter. Nevertheless, there were some findings that are worth commenting. Like former birth did have a noticeable mean overweight of strong SOC in the group of the pregnant women who has got one child and more from before. The mean value in the group of the primiparae was 47.67 and in the group of those who have born children earlier were 50.56. A t-test was done to look at the statistical significance. The t-test showed that there was a significant difference between these groups, (t=-2.54, p=0.01).

In the group of age it was also an apparent association between age and the level of SOC. The mean value in the youngest group was 46.4 while in the oldest group the mean value was 50.60. However, a t-test between the different levels of education showed that there was no significant difference between these groups. (t=-1.70, p= -0.12).

### 6.1.3 Demographic information about the sample and the level of physical activity:

When it comes to the level of physical activity (PA), there was a higher level of METs in the youngest group of respondents, compared with the oldest group. In the youngest group the mean was 27,4 METs, against 24,4 METs in the oldest group. However, a t-test showed that there was no significant difference in these two groups. (t=0.35, p=0.66) The education level does not seem to have any influence in the PA level, the mean value of METs were distributed from 24.22-25.50. It was a viable higher level of METs in the group of married women (27.19), compared to those who were cohabitants (24.70), which made it interesting to look further to a t-test to check if there was any significant analytic difference. The t-test showed no significant different between these groups. (t=0.55, p=-0.59).

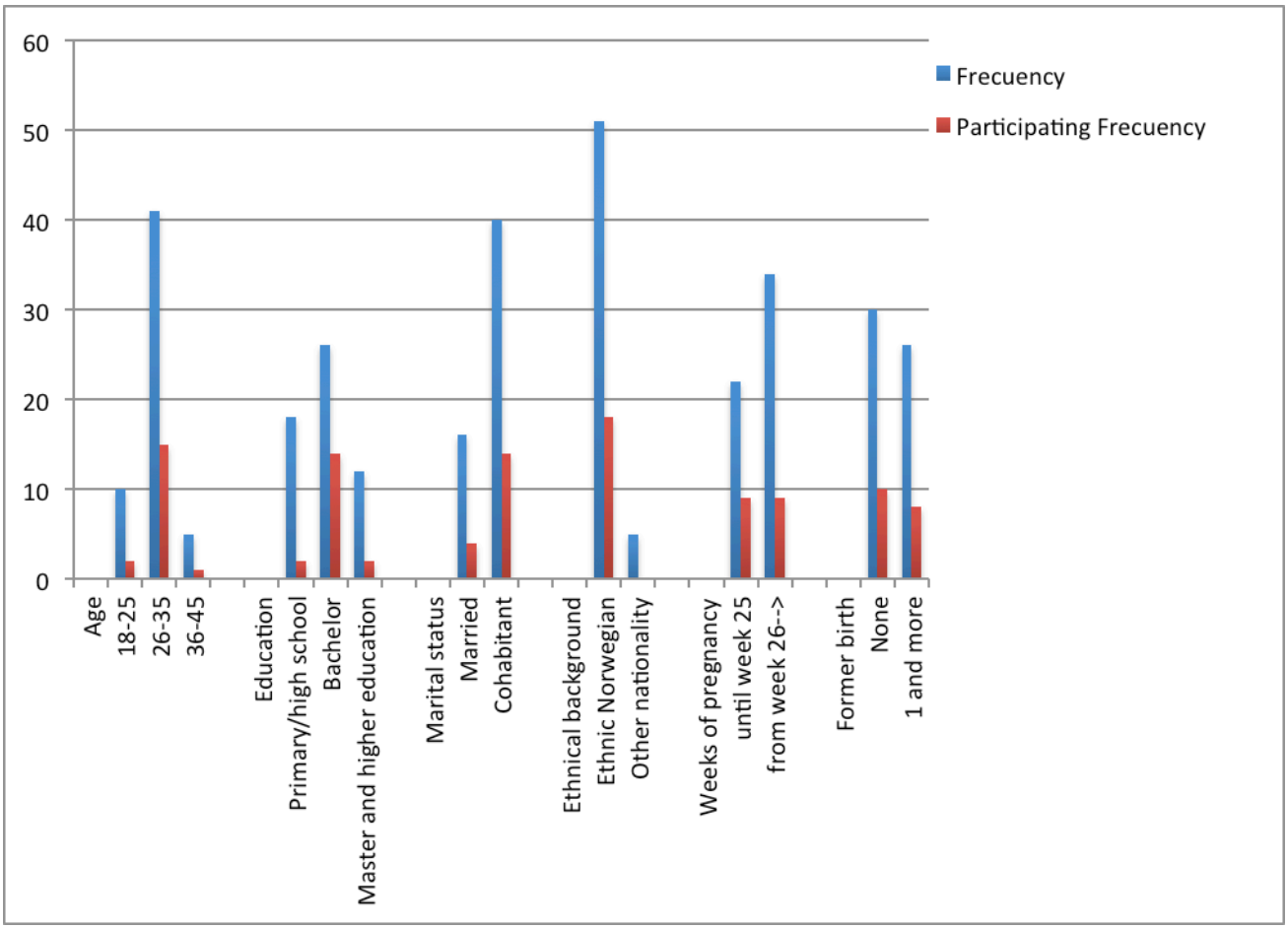
Ethnical background has an impact on the level of PA for pregnant women. The level of PA, measured in METS, is in the Norwegian participants by mean 26.55 and in the group of other nationality are 13.80. However, a t-test did not show any significant difference between these two groups. (t=1.83, p=0.07) It is important to note that there was very big difference in the size of these two groups. The data was not normally distributed, so it was difficult to find significant findings.

The level of PA was declining as the pregnancy progress. The mean value in the group of pregnant women until week 25 was 28.96, and the group for those who were pregnant after week 26 was 22.94. Pregnant women were less vigorous in physical activity and this did automatically lead to lower score in Mets. A t-test did not show any significant difference between these two groups. (t=1.48, p=0.15) Those who have children from before tended to be less active than primiparous. The mean METs for the primiparous group was 28.67 and in the group for those who have children from before the mean value was 21.65. A t-test showed a very close to significant difference between these two groups. (t=1.75, p=0.09).

## 6.2 Overview of the participation in the free offer of exercise for pregnant women

Since the main research question is about participation in the free offer it is of interest to get a visual picture over the participation. This is schematically prepared in a bar graph (figure 3). The various findings will also be explained more in detailed in the following text.

**Figure 3: Frequency of pregnant women in the survey and participation in the free offer of exercise.**




There were 18 pregnant women who reported to participate in the free offer of exercise of the total survey number of 56. Which showed a participation rate of 33.33 %. Including the women with high intention to participate in the free offer, the number was 20, and the participation rate 35.7%. This number may be of importance when it comes to evaluation of this free offer. To elaborate this figure further, it was of great interest to look more into detail of the different information hiding behind the figures. The various control variables was helpful in this case and they will be looked at more thoroughly further in this chapter.

A high number, 83.3 % of those of who answered that they participate / have participated in the free offer of exercise were in the age group 26-35 years. There was a large majority (77.8%) of pregnant women with bachelorship participating in this project. When it comes to the marital status the numbers in this project showed that those who were cohabitant (77.8%) are more likely to participate than those who were married (22.2%). This is a difference from the previous figures that showed that those who were married were most active. This

indicated that those who were married was most active, but did not participate in the free offer of exercise.

It seems like there were no pregnant women with ethnical background participating in the free offer of exercise and there was a slightly overweight of primiparous (55.6%) participating compared to those who have one child or more children from before (44.4%). These were numbers in line with previous research that will be further explained in the discussion part.

## 6.3 Associations between the Sense of Coherence, physical activity and participation in the free offer of exercise

SOC is according to Antonovsky (Antonovsky, 1979) related to physical health. Previous research is divided whether there is a connection between the level of SOC and the level of physical activity. The main purpose of this study is to look at this relationship between SOC, level of PA and participation in the free offer, and maybe find possible explanations that might support Antonovskys theory or results consistent with previous research. Further analysis of the research question will say something about this and maybe give other possible answers to the research questions.

**Table 3: Binary correlation (Pearson r) between Sense of Coherence and behavioural variables in relation to participation in the free offer of exercise for pregnant women (n=56)**

| **Behavioural Variable** | **Pearson correlation with SOC** | |
|---|---|---|
| | **r** | **p** |
| Participation in the free offer of exercise | 0.005 | 0.972 |
| Intention to participate in the free offer of exercise | -0.069 | 0.613 |
| Physical activity level in METS | -0.016 | 0.905 |
| Physical activity level (Godin 2) | 0.073 | 0.594 |

The relationship between was investigated using Pearson product-moment correlation coefficient. There was no correlation between Sense of Coherence and participation in the free offer of exercise, (r= 0.005, p=0.972). When it comes to the SOC and the intention to participate, there was neither any significant correlation, (r=-0.69, p=0.613).

Based on Antonovskys theory (Antonovsky A., 1997) and previous research (Sollerhed, Ejlertsson, & Apitzsich, 2005) the concept meaningfulness (ME) defined as the motivational component, seems to be the main concept to affect whether you are physically active or not. This concept seems to be especially important, because people with high motivation are often committed and find more easily resources and ways to manage to be physical active. On the basis of lack of significant findings in the main research question and a desire to address the research question even further, there was done a Pearson r correlation between these three core concepts and the question about participation in the free offer of exercise. Even by dividing up the three core concepts of the Sense of Coherence; Meaningfulness, manageability and comprehensibility, there were not found any correlation of notice. The most interesting concept, ME (meaningfulness) showed no correlation with SOC, (r=-0.006, p=0.966).

Since the research question is about physical activity, it is also essential to see if there is any relationship between the pregnant women's level of physical activity and their degree of SOC. The relationship between SOC and the two measures of physical activity (METs and Godin 2) was investigated using Pearson correlation coefficient. There was no correlation between either of them. SOC and METs, (r=-0.016, p=0.905). SOC and the Godin 2, (r=0.073,p=0.594). Which means that there is no relationship between the SOC and the physical activity, also referred to as physical health.

## 6.4 Pearson correlation with participation in the free offer of exercise and the control variables

This chapter contains statistical analyses aimed to answering the second part of the research question. This analysis will provide a better overview of which pregnant women who have participated in the free offer so far and say something about those who have an intention to participate in the free offer of exercise.

**Table 4: Binary correlation (Pearson r) between participation in the free offer of exercise for pregnant women and control variables (n=56)**

| Control variables | Pearson correlation with participation in the free offer | |
|---|---|---|
| | **r** | **p** |
| Physical activity level in METS | 0.012 | 0.932 |
| Physical activity level (Godin 2) | 0.363 | 0.006 |
| Age | 0.046 | 0.739 |
| Education | 0.102 | 0.455 |
| Ethnical background | -0.215 | 0.111 |
| Marital status | 0.097 | 0.478 |
| Weeks of pregnancy | -0.125 | 0.359 |
| Former birth | -0.027 | 0.841 |

The results of importance will be presented by the degree of significance. Participation in the free offer and the physical activity level (Godin2) indicated a strong correlation, (r=0.363, p=0.006). This means that those who participate in the free offer does also have the highest values of level of physical activity in general.

Ethnical background in my sample, showed a noticeable negatively association between the group of other nationality and participation in the free offer, (r= -0.215, p=0.111). As mention earlier the result from the correlations in the group of ethnical background should be treated with caution. But it is still important to look at the results as an indication of the results from this group since the group is represented, but only in a minority.

Other result of notice was the association between participation in the offer and weeks of pregnancy (r=-0,125, p=0,359), though it was not a significant correlation. There are several pregnant before Week 25 that participate in the offer than those who are pregnant after week 26. This may have a natural explanation, but it also says something about the offer might be best suited and adapted to women in the first part of pregnancy.

Education and participation showed a noticeable pattern of association. However, the correlation did not show any correlation, (r=0.102, p=0.455). Considering that this offer is intended for everyone, regardless of background, there seems to be a pattern showing that those with higher education are those who would rather participate in this offer.

## 6.5 Pearson correlation with intention to participate in the free offer of exercise and the control variables

As a part of the question of participation, is of interest to look at the intention to participate in the free offer of exercise, as this says more about the measures of behaviour.

**Table 5: Binary correlation (Pearson r) between the intention to participate in the free offer of exercise for pregnant women and control variables (n=56)**

| **Control variables** | **Pearson correlation with the intention to participate in the free offer** | |
|---|---|---|
| | **r** | **P** |
| Physical activity level in METS | 0.086 | 0.528 |
| Physical activity level (Godin 2) | 0.330 | 0.013 |
| Age | 0.095 | 0.485 |
| Education | 0.161 | 0.237 |
| Ethnical background | -0.014 | 0.919 |
| Marital status | -0.021 | 0.877 |
| Weeks of pregnancy | -0.235 | 0.082 |
| Former birth | -0.086 | 0.528 |

It was in my project a strong relationship between intention to participate and the physical activity level (Godin 2), r=0.330, p=0.013. This means that those with high intention to participate in the free offer of exercise are also more often physical active in general.

# 7. Discussion

This part of the thesis discusses the results from the project in context of theory and previous research with the purpose to answer the research questions. The chapter starts with a general discussion of the participation in the free offer of exercise as an introduction to the discussion of the research questions discussions.

## 7.1 Participation in the free offer of exercise

Based on advice on health effects of physical activity for the pregnant women and the fetus, interventions like free offers of exercise is very important measures to increase the level of physical activity (Owe et al., 2009). Norwegian Directorate of Health (2014), recommends pregnant women to participate in physical activity of at least 150 minutes a week. According to research, do 14. 6% of the Norwegian pregnant population follow these guidelines (Gjestland et al., 2012). Women who has been physical active prior pregnancy may continue, but with adaptions. Women who have not been physical active before pregnancy are recommending to be physical active in moderate intention and rather increase the level carefully. Exercises that strengthen the pelvic floor are especially important. Activities with an increased risk of injury, should however be avoided. (Norwegian Directorate of Health, 2014). Facilitated exercise leaded by professionals may actually increase the physical activity level, since research shows that uncertainty about how to exercise, knowledge of benefits and risk of exercising often are common reason to become or remain physical active during pregnancy (Duncombe et al., 2009).

Health professionals play a central role, and should be able offer information about how the pregnant women exercise safely, enjoyable and comfortable in early pregnancy. This information should be in line with current guidelines and adapted to suit each individual (Norwegian Directorate of Health, 2005). Research from Evenson & Bradley (2010) and Clarke et al. (2004) shows that there is often limited information from the GP or/and the midwife on guidelines for physical activity during pregnancy. Although information about lifestyle and physical activity are obligatory topics of conversations related to Guidelines for antenatal care (Norwegian Directorate of Health, 2005). The first meeting with the midwife in prenatal care involves a large amount of new information and formality, and this may lead to important information being left unsaid. Midwives have a high pressure of work and it is

required that they always take an assessment of what is most important for each particular women (Basu et al., 2014). This may be a part of the explanation why some pregnant women not receive information about lifestyle and the free offer of exercise.

In my project, 20 of 56 of the respondents, included those with high intention, have replied that they have participated in the free offer of exercise, which gives an actually participation rate on 35,7%. There are no documented numbers available from similar offerings, which make it difficult to compare whether this is a high or low participation. Still, the participation in the free offer is well below 50%, which must be regarded as a free offer with great potential for improvements.

The Government of Norway gives great importance to the work of the national public health. According to Public Heath Report (2013), the goal is to facilitate a good society that provides good conditions for health. The basis for public health policy is in line with Antonovskys view of health. Health does not only imply the absence of disease, but also a full state of satisfaction and wellbeing. Health is something we may have more or less of, that means it is not so that we are either healthy or sick. Norway, like many other countries in the world, shows unfortunately a clear social inequality in health (Ministry of Health and Care Services, 2007). Offers contributing to equitable distribution and inclusion of all people in the society is especially important in the work of inequalities. Municipalities have a responsibility to have an overview of challenges and opportunities, and elect measures to promote population health (Ministry of Health and Care Services, 2013). Free offer exercise for pregnant is supposed to be such an offer. Viewed from the outside on the basis that the offer is free of charge, requires little equipment and involve simple exercises, this offer should be very popular and attractive. Women expressed in a qualitative descriptive study from Cioffi, et al. (2010) that a common reason why they were not physically active was lack of motivation, lack of time, limited access, having children to look after and work situation. At the same time, the same women expressed that meeting others in the same situation is very motivating and to receive advice and practical guidance from professional was reassuring. They also reported in the same study that and being physically active is good for the child, body and mind. How can it be that only 35.7% of those surveyed pregnant women in this study use this offer? It is of great importance that such offers are followed up and evaluated, something this study may provide.

In addition, it appears to be relative few participants in the free offer of exercise in general compared to the available opportunities. It looks like it is still some work to do for the organizers to reach out to several pregnant women and increase the participation.

## 7.2 Association between Sense of Coherence and the participation in the free offer of exercise during pregnancy

When it comes to addressing the main research question of this project, an association between Sense of Coherence and participation in the free offer of exercise was not found. Apparently, no previous research has investigated the causal relationship between SOC, pregnant women and participation in such exercise offers, or the relationship between SOC, pregnancy and level of physical activity. According to already created theory and previous research, it was a little bit expected to find a significant association between strong SOC and participation in the free offer of exercise. Different studies even suggest that a strong SOC is associated with lower mortality risk (Super et al. 2014), lower incidence of diabetes (Kouvonen et al., 2008) and delay of the onset of cancer (Poppius et al. 2006). These are studies on diseases related to physical inactivity (Norwegian Directorate of Health, 2014).

To be able to compare and discuss the result in this project, it is necessary to look at similar research. In a study done by Allison et al. (1999) were 1395 Canadian adolescence was included from a national population health survey, logistics regression models was used to estimate models of risk behaviour. That survey included women and men, but not pregnant women. The aim was to look at the individual and different social determinants, as they were supposed to be related to health. There was no significant association between the SOC and level of physical activity. The result was partly explained by the use of the measures of the different independent variables. Which comes up like an aspect to discuss also in this project, as the theory by Antonovsky (1987) is clear, together with the majority of previous research that support the theory, that there is a correlation between SOC and physical health. Physical health contains several aspects of notice. It is difficult to define physical health, because individual experiences of health and illness are rarely be the same (Nash, 2010). If you Google physical health, physical activity is one of the most common associations in the results, together with nutrition, alcohol and drugs, medical self-care and rest and sleep of (Wikipedia, n.n). There is difficult to find studies where SOC is measured together with participation in exercise offers and other measurements of physical activity, but several studies points out significant predictors of other behaviours that leads to good health.

Sjøstrøm et al. (2004) investigated SOC in relationship with the women's perceptions of well- being during and after pregnancy. Their study indicated that Strong SOC provided better well-being, less anxiety and lower predisposition to depression. Another study (Oz et al., 2009) that investigated factors predicting uncomplicated deliveries, seen in the light of SOC, found an association between SOC and improved physical health. This study from Oz et al. (2009) focused most on the psychological factors, but mentioned possible physiological factors in the maternal attitude and health perceptions.

The reviews from Flensborg- Madsen et al. (2005a; 2005b) are investigating the association between SOC and physical health. The first review (2005a) integrated more than 50 scientific publications, were the results were divided into different categories within physical health. Physical activity was listed under the category of behaviour. The overall picture however showed that SOC primarily was correlated to psychological measures. Only a few studies and weak correlation was found between SOC and physical health. In the following review from Flensborg-Madsen et al. (2005b), there was done analysis whether the questions in the SOC scale actually represent the important factors to describe the phenomenon of SOC were investigated. This was done to supplement the statistical means in validity and reliability of the SOC scale. They concluded that there exist two fundamental problems in relation to the SOC scale. Were the first problem concerns the questions in the SOC scale that are of a mental and emotional nature. They believe that it is the emotionally and not mentally part that determines physical health, so SOC scales mixes up two different concepts. The other problem they points out in their review is that the scale contains a notion of predictability. They believe that the presumption that occurrences do not have to be predictable to evaluate whether a person achieves strong SOC.

Based on these several previous research on SOC in relation with pregnancy and physical health, the result from the main research question in this project, may be explained by the special and time limited period of life that pregnancy is. A qualitative study from Cioffi et al. (2010) described different perceptions and factors that influenced the participations in physical activity during pregnancy. The 19 women from the study of Cioffi et al. (2010) (n=19) were interviewed face to face in different stages of pregnancy. Many women actively searched for information in books and Internet in order to acquire helpful information about their physical activity behaviour. The women in this study found a lot of varying information about guidelines and recommendations, which in turn led to a lot of uncertainty and inconsistent information. This leads to the importance of the job for the health professionals,

as they play an active role in enhancing an optimal antenatal health among pregnant women (Browne et al., 2014). In the study from Clarke et al. (2004), lack of advice directly from health professionals turn out to be common. The study investigated 57 nulliparous pregnant women in the UK with the aim to examine the potential effect of low-risk pregnancy on women´s recreational activity patterns together with the beliefs and information sources regarding physical exercise participation. The same study explained the decreased level of physical activity pattern during pregnancy with maternal physical health in combination with social psychological factors (Clarke et al., 2004). The exercise pattern of the pregnant women may also be affected by the unsafeness of being physical active during pregnancy (Duncombe et al., 2009). The review from (Gaston & Cramp, 2010) points out that there were few studies that had investigated barriers to exercise during pregnancy. The review contains 25 articles published from 1986 to 2009 in English peer-reviewed journals. In addition the most common mentioned barriers was lack of time and tiredness.

Apparently, findings from this particular project, shows that mapping the pregnant women SOC may not be a useful tool when it comes to explain participation in the free offer of exercise for pregnant women. However, this result could refer to support the municipal decision to invest money and funds in such offers. We know now that the pregnant women, regardless of their level of SOC, participate in the free offer of exercise. This is information in line with the efforts to try to reduce social inequalities in health. This information could also supply important information to the organizer, in this case “Frisklivssentralen”, in addition to evaluate the free offer of exercise.

To try to explain further why it was not found any association between pregnant women, SOC and participation in the free offer, it is necessary to look deeper into SOC in relation to pregnancy.

Pregnancy is a life event that may affect the individual's SOC (Antonovsky, 1979), but it is different how the pregnant women cope with the new condition (Dørheim et al., 2012). This survey included volunteer pregnant women with no exclusion criteria. The pregnant women did only respond to the questionnaire once and it was randomly how far they had come in their pregnancy, so it was difficult to know who changed SOC from its original. Antonovsky (1979) says that a pregnancy may influence the level of SOC, but if pregnancy proceeds normally it is most likely that SOC will return to the same level as before pregnancy. It is also of interest to comment that Antonovsky argues that the shaping of SOC takes

substantially place during adolescence and remains stable from the 30s, except if something dramatic happens in life (Antonovsky, 1979). This theory may be a little out-dated, as it has been shown in research published as early as 1997 (Geyer, 1997) that there are challenges, which may influence the SOC not only when something dramatic happens. Challenges in work life and personal relationship are extending far above the age of 30, and may influence a person SOC. Even pregnancy today is most common after age 30 (Norwegian Institute of Public Health, 2015). The SOC might not be as rigid as Antonovsky first suggested. Since Antonovsky did not decided a standard limit for what is weak or strong SOC, the SOC in this study is rated as the higher score, the stronger SOC and vice versa. This is in line with similar research in the area (Ing & Reutter, 2003, Oz et al. 2009). Average SOC in this study group was 48.96.

Pregnant women participating in this form of exercise classes, is a group to be considered as time-limited and very unstable. Pregnancy is a time in life exposed to social, psychological, behavioural and biological changes (Gaston & Cramp, 2010). Antonovsky claims that it is irrelevant to talk about SOC within a group, as long the group is time-limited and unstable. He says that it is more important to look at the individual SOC and the impact it may have on each other (Antonovsky, 1997). This might be considered as an explanation why the finding in this project, does not get along fully in line with the theory of Antonovsky.

When it comes to the group of pregnant women participating in the free offer of exercise, the pregnant women with strong SOC are often more positive to changes (Pallant & Lae 2002). They are handling new challenges well and may go ahead as good examples for the others in the group (Antonovsky, 1997), as it is quite normal to imitate each other in a group. Imitation and reflections of the others in the group provides a sense of security (Svedberg, 2002). According to the study from Sjøstrøm et al. (2004) it shows that those with stronger SOC, rates better well-being and more stable emotional status. On the other hand, it may seem intimidating for those with weak SOC to socialize with people if they have great faith in themselves, a lot of confident and besides seems to be very physical active from before. If they do not identify themselves with the group, there may be a chance that they feel uncomfortable and stops their participation in the free offer of exercise. According to Antonovsky (1997) does generally people with strong SOC tend to seek groups and communities with predominance of strong SOC. The result from this analysis of SOC and participation in the free exercise for pregnant women shows that the free offer of exercise may be a way to gather pregnant women with weak and strong SOC in one group.

Antonovsky believes that it is beneficial for people with weak SOC to socialize with people with strong SOC (Antonovsky, 1997). Pregnant women with strong SOC provide better ways with dealing with new and stressful situations (Sjøstrøm et al., 2004) and may easier adapt a possible new healthy lifestyle (Wainwright et al. 2008).

## 7.3 Associations between Sense of Coherence, participation in the free offer of exercise and the control variables

This part of the thesis will deal with important elements of the analysis of the project, in conjunction with demographic background information. The aim is to answer the second part of the research question; "Does the control variables age, education, marital status, ethnical background, weeks of pregnancy and former birth have any influence on the pregnant women level of SOC and the participation in the free offer of exercise?" It will be discussed various explanations and suggested reasons from the findings in this project. Mainly key variables that showed a significant and/or strong level of relationship in SOC and participation of the free offer of exercise will be discussed.

Intention to participate and participating in the free offer is statistically highly correlated, which means that those who have a strong intention to participate in the offer are almost the same pregnant women as those who are participating in the free offer. There were only two respondents with high intention to participate who have not participated in the offer yet. In the following discussion the intention to participate in the free offer will be most emphasized, as it contributes to more current information about the pregnant women's attitude related towards exercise and physical activity, whether they participate in the free offer or not. In order to make good and effective interventions to promote physical activity participation, it is like Rhodes and Bruijn (2013) claims of great importance to try to understand the relationship between personality and behaviour. SOC could say something about the pregnant women personality. Measuring the SOC together with intention to participate might provide some information of the background of the individual behaviour. This study showed no significant correlation between the intention to participate in the free offer of exercise and SOC. However, there was an obvious and significant connection between the participation in the free offer of exercise and the level of physical activity. This means that the respondents, who are most active in their leisure time, are also those who participate in this offer. This in turns may tell that the free offer suits best for those who are active from before. Which may be useful feedback for those who organize such free offers.

The reason why there is a association between participation and level of physical activity, might be the same as reported in the study from Hausenblas et al. (2008) that the pregnant women who are physical active before they become pregnant, probably evaluate this offer positive for them and the child, and accordingly prioritizing to attend. The pregnant women, who are accustomed to exercise, does often know the benefits from being physical active. The review from Gaston & Cramp (2011) included seven studies that examined this relation and six of them showed that women who were more active prior to pregnancy remained more active during pregnancy. These women might look at such a free offer of exercise as another offer they want to try as a variation to their regular exercise. The review from Hagger at al. (2002) comments that an already established pattern of physical behaviour, influences the intention and predicts further physical activity. While those who are not accustomed with exercising, may look at the new offer of exercise like a barrier. It is unknown and they are unsure if it will suit them. Just the word exercise, might be intimidating. Hagger et al. (2002) suggest finding possibilities to encourage people in activities they feel comfortable in may be important initiatives, as it might be decisive for the attitude and participation in physical activities.

The analysis from this project shows a small, but close to medium strength of relationship between participation in the free offer of exercise and weeks of pregnancy. These are expected changes, as the pregnancy represents a period of rapid physical and psychological changes (Hausenblas et al., 2008). This finding is following being discussed, together with the SOC. The SOC and weeks of pregnancy did not show any significant relationship in the statistical analysis, but demographic information indicates a minor level of stronger SOC in the group of those who are pregnant after week 25. These are important aspects to discuss, as it may contribute important information about the free offer and factors that influence desicions to participate in the free offer of exercise, during the different trimesters of the pregnancy. Hence, it is interesting to discuss these findings in light of the research from Cioffi et al. (2010) and TPB, where the different phases of pregnancy are divided in three parts. First phase is extending until week 19 and involves uncertainty over the new existence (Cioffi, et al., 2010). Early pregnancy is often related to a lot of insecurity, both in terms of the risk of miscarriage and the experience of a new body condition (Evenson & Bradley, 2010). The desire to do what is in the best interests of the child are most important and the pregnant women does often follow given and told guidelines, as long they are not tired or bothered with nausea (Cioffi, et al., 2010). The next phase last from week 20 to 29 and is

about the pregnant women adapting being pregnant and feel more confidence in the situation. If the womens health are good, good routines for physical activity may be incorporated and adapted as the pregnancy progress. Studies from Downs et al. (2003) show that perceieved behviour, which means whether the pregnant women have motivation, like intention to participate in the offer is more crucial than their evaluation of ease or difficulty of participating. The final stage, after week 30, is the phase when the pregnant women is approaching birth and the mind may already have passed into the next phase which is the birth and puerperium (Cioffi, et al., 2010). These phases may be helpful to explain why there is reduced physical activity level for those who is pregnant after week 25 and a little predominance of the stronger SOC among pregnant women after week 25. The way the pregnant women experiences SOC and degree of physical activity vary greatly on how far the women have come in pregnancy (Sjøstrøm et al., 2004). Pregnancy causes changes in the physical activity pattern. Even among those who were often physical active before pregnancy, the level of PA decline (Hausenblas et al., 2008). Lack of facilities as the pregnancy progresses have been reported like a common cause of less physical activity late in pregnancy (Clarke et al., 2004). A free offer adapted for pregnant women with professionals present, like the offer in this study, should be considered to be a great measure to keep the pregnant women active. Somehow, does this study, like others (Hausenblas et al., 2008; Cioffi, et al., 2010) indicate that the level of physical activity declines after the second trimester, which make it interesting to evaluate the offer in the way that it could have been organized differently, like parted into two different groups? Maybe that would have made it more interesting and practical for everyone, and the participation could have been increased? It is nevertheless independent of weeks pregnant or if they are first-time mothers, great uncertainty around the topic physical activity and pregnancy (Evenson & Bradley, 2010).

The review from Gaston and Cramp (2010) shows that many studies have investigated pregnancy and physical activity without considering the different stages of pregnancy. Pregnancy is characterized by a number of bodily changes, so it is of importance to distinguish between the different trimesters. The pregnant women in this project wrote their actual week of pregnancy in the questionnaire. This was helpful in the way it supplied some information about the week of pregnancy the activity levels declined, and together with the control variables this might give an indication to the decreased level of physical activity during pregnancy. The study from Haakstad et al. (2007) where 467 pregnant women completed a questionnaire in gestation week 36, including retrospectively questions

concerning each trimester and level of physical activity, confirms the decline in the exercise frequency as the pregnancy progressed. Less sleeping, reduced mobility, lower feeling of energy and increased feeling of pain was pointed out to be explanations to reduced sense of well being towards the end of the pregnancy in the study of Sjøstrøm et al. (2004). These are explanations that also may be related decreased level of physical activity during the pregnancy.

The relationship between age and education in this project is in line with the statistical numbers (Statistics Norway, 2014). The oldest pregnant women do also have the highest education. Among women in Norway there is 38.7% who has listed high school as the highest education, 26.4% bachelor (involves continuing until 4 years) and 6.9% with master or higher education (Statistics Norway, 2014). This shows that the largest group of women in the society are those with lower education, while those who are participating in the free offer of exercise for pregnant women holds bachelor education or higher (26%). Only 18 % of those with lower education participate in the free offer of exercise. Younger pregnant women with lower education, does often performs jobs to a greater extent in occupations where sick leave is high (Myklebø & Thune, 2010). That could make it difficult to be physically active and perhaps even not a priority. Physical inactivity together with different lifestyle diseases is strongly social skewed (Statisitics Norway, 2013). The review from Gaston & Cramp (2011) confirmed that having a higher education and income was one of the demographic examined variables that stood out as consistent predictors of higher level of physical activity. This may explain why so few with lower education participates in this free offer of exercise.

The majority of the respondent (83.3%) who answered that they participate or have participated in the free offer of exercise was in the group of 26-35 years. This result is in line with the recent updates of the average childbearing age in Norway, which is 30.4 years (Norwegian Institute of Public Health, 2015). The statistical analysis of SOC and age shows a small strength of relationship. There is a slightly stronger level of SOC in the oldest group, the pregnant women from 35 years and older. Which is in line with the theory from Antonovsky (1979). According to the study from Hassmen et al. (2000) however, SOC was reported highest among the youngest persons. Which was linked to the indication of a little predominance of higher level of physical activity in the youngest group of respondents. The number of 3403 men and women who participated in the study of Hassmen et al. (2000) found that individuals, who exercised more frequently, perceived stronger SOC then those

who exercised less frequently. These contradictions may contribute explaining the main findings in this project, which yield that SOC not necessarily, correspond to higher physical activity.

It is however of great interest to look some deeper into possible reasons why this project indicated that the oldest women have strongest SOC, but are less physical active, based on the demographic information. This project did also indicate a small relationship between strong SOC and higher education. This is was an interesting and unexpected result, as those with higher education and stronger SOC tends to show stronger interest in learning, possessing broader knowledge in general (Togari et al. 2008), which in turn is associated with higher self esteem (Pallant & Lae, 2002). Additional, women with strong SOC and higher education are suppose to be most likely to check out information about ways to exercise safely, so they may continue to be physical active during pregnancy. Several studies (Hassmen al., 2000; Togari et al., 2008; Super et al., 2014) indicate that high SOC correlates with high level of physical activity. These studies did not involve pregnant women, which may be an important factor to mention. Proposed reason why pregnant women with high SOC are less physical active may be justified by other explanations, like the control variables. The association between SOC and former birth was significant positively correlated in this project. Which means that those who have children from before, multiparous, have stronger SOC then the nulliparous. This is in line with the theory (Antonovsky, 1979) and previous research from Sjøstrøm et al. (2004). Sjøstrøm et al. (2004) found significant relation between SOC and multiparous at weeks 34-36. They investigated 120 Swedish pregnant women and the questionnaires were filled in at pregnancy week 10-12, 34-36 and 8 weeks after delivery. The interesting part was that the SOC measured 8 weeks after birth did not show any significant difference between the multiparous and nulliparous. The study did not say anything about who increased their SOC or lowered the SOC. That information would have been of great interest for this project, and the strength of the significant finding between SOC and former birth. The study from Sjøstrøm et al. (2004) could have showed, if the SOC increased during pregnancy, that pregnancy might be considered as an event that effect the degree of SOC. While, if the SOC decreased after pregnancy, would have shown that pregnancy is a life events that might temporarily alter the degree of SOC, as the persons will return to their original SOC after pregnancy. Multiparous women reported, lack of time, practical problems related to children and caregiving at home, as reasons why it was difficult to be physically active (Haakstad et

al., 2007) in general and while they were pregnant. Studies done by Bellows-Riecken and Rhodes (2008) shows that parenthood are negative correlated to physical activity, and women are even more sedentary than men. Women with families and obligations have less time to be active in organized context. The free offer of exercise is arranged once a week, but its due time may lead to a greater barrier for their decision to participate, then the nulliparous (Haakstad et al., 2007). It is seen a pattern were multiparous do not participate in the free offer of exercise, are not very physically active in their spare time either. They are probably not sedentary, but this not evaluated or measured in this study. Though, it was measured in the study from Haakestad et al. (2007) in relation to weight gain. The study showed that physical activity related with household and childcare did not reduce the rate of maternal weight. Which means that the multiparous was probably not more likely to be physical active then the nulliparous, as weight gain is one side effect of pregnancy that might be related to physical inactivity (Haakestad et al., 2007) A high percentage of the 467 investigated women in the research from Haakestad et al. (2007) gained more weight then the recommended weight gain during pregnancy.

Another possible explanation to the strong SOC and low level of physical activity, is that the older pregnant women, with strong SOC might not feel the same pressure in following the fitness trend and that “everything needs to be perfect”-, trend that are highly focused in the social media these days (Westerveld & Knapstad, 2014). Fredriksen et al. (2010) suggest that this “trend”- behaviour is most common among first-time mothers. But again, those who remain the strongest SOC are suppose to seek and evaluate what is reasonable information and further follow these. In the process of thinking of possible explanations, there are several possible reasons to be mentioned. It could also be that important information, such as physical activity during pregnancy, can be forgotten or not told to people with high SOC from the health professional’s side. Strong SOC is as already pronounced associated with higher education, higher self esteem, higher feeling of good control of life and general more positive to changes in life (Pallant & Lae, 2002). Healthcare professionals may take it for granted that those with higher education and high confidence know the important guidelines on physical activity and pregnancy. Although you have a high degree of education in for example leadership, it does not necessary mean you are interested and concerned about physical activity and pregnancy. These women do also have needs and requirements for information. This possible explanation is based on even experienced and random feedback from people working in the health sector, indicating that they might forget to tell important

information when it appears that person already know it. This explanation may though seem a bit weak, as those with strong SOC are hypothesised to promote the beneficial use of the resources in order to maintain or move towards the healthy side of the continuum (Super et al., 2014), but still worth mentioned.

When it comes to ethnical background and participation of free offer of exercise, results from this study shows similarities with previous research (Rabanal et al., 2013). None of the participating pregnant women with other nationality participate or have participated in the free offer. Since the two different ethnical background groups vary widely in size, it is difficult to present a significant finding in the analysis correlation. In the demographic background information in this study, it seems like the immigrants are far below average physical activity levels. Reasons why this ethnical difference in the level of physical activity occurs are unfortunately little researched (Norwegian Institute of Public Health, 2014). The structure of Health Care, and other parts of the Norwegian welfare state is often little known to immigrants (Lunde & Kjelvik, 2012). Many immigrants do not have the knowledge on how and where to seek help. Essentially is the information about this free offer given by a GP or a midwife. But it has also been promoted through social media. So one can say that it is an offer that want to reach out to everyone, but cultural differences, religion and language is a major challenge in this context. Lack of use of interpretation services may also be an explanation (Saastad et al., 2007).

The proportion of immigrants (persons born abroad with two foreign-born parents) has risen sharply in the population over the last years. The latest numbers from 2015 shows that 13 percentage of the population in Norway is immigrants (Statistics Norway, 2015). This is information also confirmed by midwives who contributed to this survey. Immigrants are overrepresented in low-income groups and a relatively high percentage of people in some immigrant groups have little or no education (Norwegian Institue of Public Health, 2014). Anyway, the results concerning ethnical background may be findings that say more about the process of the inclusion of the pregnant women with other nationality in this project, than the reality. It is nevertheless an interesting finding, as the job of reducing social inequalities continues unabated. Considering the free offer of exercise for pregnant women shall include all pregnant women in society, it should be done some more action to inform and include those with other nationality to a greater extent.

# 8. Evaluation

To systematically review the process and experiences of the project, it may be useful to make an overall evaluation.

## 8.1 General evaluation of methods:

To find answers to my research question quantitative method was a preferred choice. This was based on the desire to generalize, bring up numbers and reach out to as many potential pregnant women as possible, in the shortest time possible. Although the response rate was fairly high and the results did say something about the association between SOC and who uses the free offer, a mixed methods approach would have done this project even more comprehensive. An inclusion of a qualitative part in this project could have been advantageous, in the way I could have as asked the pregnant women more open and directly questions. This would have provided more detailed information, which could have strengthened the findings of the quantitative part. On the other hand, SOC is a sensitive area, so it could have been challenging to include the women to talk about this subject, face to face in an interview.

The survey was given to every pregnant woman who visited the midwife and/or participated in the free offer of exercise, without any exclusion criteria. The aim was to include a sample as large as possible and to simplify the job for the midwives, who were asked to distribute the questionnaires. By not having any exclusions criteria it is difficult to distinguish between the reasons of the choice to participate or not. Risk pregnancies or other medical reasons could have been explanations to the refrain in the offer and decreased level of physical activity, something this study does not take into account.

It is of great interest and importance to include pregnant women with other nationality in project like this. This project was unfortunately not well enough prepared for the possibility to include every woman with other nationality. The questionnaire was only delivered in Norwegian language, which was one of the reasons why so few with other nationality were included in the project. The midwives gave early feedback to the researcher about this dilemma, because they felt uncertain about the delivering process. The midwives are already pressed in time, so the inclusion in the study should probably have been done differently. The information about the project and the questionnaire could have been done in English or

even translated to other language. It could have been used an interpreter, and the researcher could have made it suitable for those who wanted to participate in the project by translating the questions. This challenge was discussed with one of the midwife, and we ended up with continuing to deliver the questionnaire in Norwegian language in this project. This resulted in a not planned exclusion for some pregnant women. This says something about the importance of preparation and facilitation ahead of a project. The study from Jenum et al. (2010), which was a population based- cohort study of 823 pregnant women attending Child health clinics in Oslo, Norway, was able to include a representative group of multi-ethnic women. The questionnaire was translated to eight language and the midwives was familiar with the questions and trained to reduce barriers for inclusion and participation.

I think that the given time available was a challenge for the implementation of my project. Despite tremendous efforts by the midwives at the local Heath Centre to deliver questionnaires, it would have been of great interest to spent more time with the data gathering. Extended period of time could have given me an opportunity to looked closer into the challenge about including pregnant women with other nationality and tried other ways to include participants to achieve a larger sample size. This could have been done through the local newspaper, social media or cooperation with several GP.

## 8.2 Evaluation of the Questionnaire

It was clearly a benefit to use anonymous postal questionnaires to achieve a relatively large sample size. With the aim to reach as many pregnant women as possible in the shortest amount of time, it was a huge advantage to be able to cooperate with the midwives at the local health Centre. Handing out the questionnaire personally from the midwife and the researcher visiting the free offer, may also have contributed to a greater participation in the survey. The fact that an already stamped envelope was provided to the potential respondents also seems to have facilitated the responses for the pregnant women.

Based on a fairly high response rate of survey (64.4%) and feedback from the pregnant participants, that the questionnaire was simple and easy to complete. There was no missing data as every question was answered. The choice of using a five-item scale, instead of 7-item scale in the SOC-13 part of the questionnaire, may also have made it easier to answer the questionnaire. In fact that 5-item scales are shorter, but still covers a nuanced answer option helps to justify the choice. According to (Ringdal, 2007) is it important to limit the choices

of answers with questions concerning attitudes and behaviour. The questions are the same, as in the original SOC-13 questionnaire, which is most important. Meanwhile, by not using 7-item scale, which is applied in the original response options, the possibility of comparisons is limited.

For what concerns the part of the questionnaire regarding the level of physical activity, in the Godin Leisure time exercise questionnaire, small changes could have made huge differences. It was difficult to find suitable questionnaire to measure physical activity among pregnant women. Other studies measuring physical activity among pregnant women based the questionnaires on known standardised modified questionnaires (Clarke et al., 2004; Gjestland et al., 2012). The Godin Leisuretime exercise questionnaire was applied in this project of the reason it is well-known and widely used to measure levels of physical activity, regarded to the strength of reliability and validity. The questions though, were not adapted to suit pregnant women, which was a common feedback written on the questionnaires from the respondents. The examples of activities regarding the intensive physical activity item contained exercises that pregnant women should avoid. These examples were ice hockey, football, handball, alpine skiing and judo. These examples may have caused conceptions about the questionnaire as inappropriate. Some respondents did also write comments beside the questionnaire, with numbers of the activity level before pregnancy. Several of the respondent that were pregnant after week 33 wrote the difference in early pregnancy and the middle of the pregnancy beside the line of the number from the last 7 days. Other respondents did also write specific reasons like pelvic pain and nausea as explanations why they were less active now, then before they got pregnant. Two women did also write a question mark, and comment that there was no normal day anymore, beside the introduction part of Godin Leisure time exercises questionnaire part of the question: “During a normal 7-days period”. This is feedback that may be worth noting if the same questionnaire is going to measure the physical activity of activity levels in pregnant women in further studies.

When it comes to the SOC-13 part, several women wrote additional comments beside the items in the questionnaire, or a comment at the end of the questionnaire. It looked like they understood the question, because the comments were about their answers. It was more that they wanted to explain or justify why they answered like they did. For example the item: “How often do you feel unfairly treated?” Some of those who answered sometimes or often said it were because of the language or bad conditions at their workplace. In the comments at the end of the questionnaire, some respondents wrote that especially the items from the

SOC-13 were important and appropriate questions. They also demanded further questions referred to the mental part about being pregnant, beside of the SOC-13 part. These are interesting comments and might work as an indicator for the need for communication about the various topics that are addressed in the SOC-13. This suggest that SOC-13 may be a possible engaging and useful tool for health professionals to get pregnant women to talking about feelings, thoughts and focus on how they handle daily life during their pregnancy. These are comments in line with previous research (Hausenblas et al., 2008) that suggests that a search for an understanding of the relationship between psychosocial variables and exercise is important, as it could be targets for futures interventions. Sjøstrøm at al. (2004) did also suggest the SOC scale as a method to measure the capacity to cope with the unforeseeable process of being pregnant in their study.

Intention to participate in the free offer of exercise was measured in a single item scale. It would have been of great interest to include more items in the questionnaire based on the framework of TPB. It could have provided more accurate information to the organizers, since it could have been given more information about the background of the pregnant women intention to participate in the free offer. Research from Downs et al. (2003) shows that significant other plays a central role when it comes to the decision to be physical active or not. This could have contributed to important knowledge, which perhaps could have made that the free offer exercise for pregnant women also should involved partners or significant others. It is important to find effective solutions to the challenge of little physical activity in today's society.

## 8.3 Evaluation of the analysis

Lack of significant findings in selected analytical technique, is one reason why it would have been interesting to explore the data further. For example go deeper in the data material by using multiple regression analysis. Multiple regressions allow a more sophisticated exploration of the interrelationship among the variables, based on the already used correlation analysis (Pallant, 2010). There are several reasons why it was used a simpler analysis technique in this project. In the fact this was the first experience of statistic analysis for the researcher, it was preferred to keep the analysis at a manageable level. The sample size was relatively small in this project. The challenges with small sample size are that the result does not generalise with other samples, and it is very sensitive to outliers (Pallant,

2010). Further challenges by using multiple regressions could be the validity of the outcomes. Because of the small sample the degree of freedom could become sufficient to show the underlying relationship between the variables.

Some researchers have divided SOC into groups like weak / strong, weak/medium/strong for the analysis (Wainwright et al., 2008; Sairenchi et al., 2011; Sjøstrøm et al., 2004). In this project for the analysis, the summary score of SOC was attempt dividing into groups by median and tertiles. By arbitrarily dividing the SOC in three groups (weak, medium or strong), like to the research by Sjøstrøm et al. (2005), could have led to one more significant finding in the control variables. But there was no major differences in the result, so the simplest way, coding SOC as a continuous variable was preferred. This was in line with the research by Ing & Reutter (2003), Oz et al. (2009) and Takegata et al. (2014), where high score indicates strong SOC and low score indicates weak SOC. Antonovsky never standardized a clear distinction between weak or strong degree of SOC (Antonovsky, 1997), which may be a weakness in the way it becomes difficult to compare results between studies.

## 8.4 General evaluation of the project:

There was no significant association between SOC and participation in the free offer of exercise for pregnant women. I have not been able to find previous research on SOC, physical activity and pregnancy, so this finding might be considered as strength of this project in the way it fill a gap in the research. Better preparation of the questionnaire and even closer cooperation with the midwives could have increased the proportion of the women with other nationality. Hence, there was a clear feedback from the Head of the unit at the Health Centre stating that the midwives are already pressed in time, so the project had to be short and effective. Several analytical techniques were attempted during this project. That was important and necessary to increase knowledge and understanding of the processed data. The quantitative method showed quite clearly answers in terms of numbers, but the research question could usefully have been done with a mix method. The discussion in this project was essentially based on the already given theory and previous research, but causals explanations were also affected and interpreted in the line of the researcher, which may be seen as a strength or a weakness of the project.

# 9. Conclusions

This project indicates that there is no association between SOC and participation in the free offer of exercise for pregnant women. Since no previous research apparently has investigated the relationship between SOC, physical activity and pregnancy it is difficult to compare this finding with other research. However, this project contributes to fill the gap.

The result of the main research question in this project might be explained by the special and time limited period of life pregnancy implies. Additional findings in this project stresses that SOC might not be as rigid as Antonovsky first suggested. Antonovsky claims that it is irrelevant to talk about SOC within a time limited and unstable group, which pregnancy is considered to be. The origin of the salutogenesis, Antonovsky says simultaneously that it is beneficial for people with weak SOC to socialize with people with strong SOC. Something this free offer of exercise for pregnant women appears to represent.

It was found a significant association between participation in the free offer and level of physical activity. This in turns tells us that the respondents who are most active in their leisure time are the pregnant women who participate in this offer. This was supported with research from Hagger et al. (2002) who suggested that the women, who were more active prior pregnancy, remain more active during pregnancy.

When it comes to the control variables such as age, education, material status, ethnical background, weeks of pregnancy and former birth, only a statistical significant association between SOC and former birth was found. This is in line with the theoretical framework and previous research; multiparous women seem to have stronger SOC than the nulliparous. It was also found a small, but interesting relationship between those with strong SOC, high education and low level of physical activity. Another found well noticing, was the relationship between participation in the free offer of exercise and the weeks of pregnancy. These are all findings of importance to explain the main research question in this project. Former birth and weeks of pregnancy stood out to be possible explanations to the low participation in the free offer of exercise for pregnant women within the group of strong SOC.

Other nationality in the group of ethnical background was found to be negatively associated with both participation in the free offer and level of physical activity. This result has not

been emphasized as a strong finding in this project, based on the poor facilitation of the inclusion of the women with different nationality. This lack is considered as one of the weaknesses of this project. The important work with public health involves every people in the society. Measures such as this free offer of exercise, is a part of the work towards improving public health, which also includes reducing the social inequalities, so hence it is of great importance that this weakness is taken serious and act as a feedback of the current work in this area. This weakness does also indicate that women with other nationalities have bigger barriers to participate in this free offer, than others.

Findings from this particular project, shows that mapping the pregnant women SOC may not be a useful tool when it comes to explain the participation in the free offer of exercise for pregnant women.

However, measuring the level of SOC among this voluntary group of random selected pregnant women provided complementary information to the organizers, which may be helpful in their evaluation of the free offer of exercise.

# 10. Suggestions for further studies

This project contributes to the knowledge about exercise behaviours in pregnant women and participation in the free offer of exercise. The midwives in addition to providing information about the offer, has been very positive to this study and made a great effort to include pregnant women. However, it is still important to conduct further research on pregnant women and factors that promotes physical activity.

Exercise during pregnancy could be a challenge of natural causes, both physically and mentally. It would have been of great interest to research the effect of such a free offer of exercise for pregnant women. Not only in terms of physical health but also mental health. It could have been interesting to measure the SOC at baseline and after given birth, together with other measurements.

To research the pregnancy and physical activity level by trimester, would have been of great interest. Dividing the free offer of exercise into two different groups, based on the weeks of pregnancy, could have contributed to new and wider information about participation in such offers.

Considering the increasing numbers of people with other nationality who settle in down in Norway, and the pointed out weakness in this study, it would have been very important and useful to looked at the opportunities to include women with other nationalities in e.g. such free offers of exercise. Qualitative research in the form of interviews could perhaps given more answers in terms of finding solutions and improved offerings that may suit everyone.

One mentioned reason why women are little physically active during pregnancy, is lack of social support. It would have been interesting to include the partner (or important others) in interventions related to lifestyle changes during pregnancy. To be pregnant and at the same time trying to change lifestyle can be difficult to achieve alone.

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# Attatchments

## Attatchment 1: Permission to use SOC 13

UNIVERSITY WEST

Date 2014-09-29

Center on Salutogenesis
Department of Nursing, Health and Culture

Siv Lena Sitter
Hedmark University College
Campus Elverum, Department of Health Sciences
PB 400, 2418 Elverum
Norway
(sivlenas@hotmail.com)

Dear Siv Lena Sitter,

I hereby grant permission to use the 13-item version of the Sense of Coherence (Orientation to Life) Questionnaire, originally found in *Unraveling the mystery of health: How people manage stress and stay well*, by Aaron Antonovsky (Jossey-Bass Publishers, 1987), for use in your master thesis.

The permission is granted upon fulfillment of the following conditions:

1. You may not redistribute the questionnaire (in print or electronic form) except for your own professional or academic purposes and you may not charge money for its use. If administered online, measures should be taken to insure that (a) access to the questionnaire be given only to participants by means of a password or a different form of limited access, (b) the questionnaire should not be downloadable, and (c) access to the questionnaire should be time-limited for the period of data collection, after which it should be taken off the server. Distributing the questionnaire to respondents via email is *not* permitted. Finally, any electronic version of the questionnaire which you may have for your research purposes (other than distribution to research participants) should be in PDF format including password protection for printing and editing
2. The questionnaire is intended for research purposes only, and may *not* be used for diagnostic or clinical use. By "diagnostic or clinical" it is meant that the SOC score cannot be the basis of any kind of physical, mental, cognitive, social or emotional diagnosis or assessment of the respondent, and cannot direct therapeutic or medical decisions of any kind.
3. In any publication in which the questionnaire is reprinted, reference to the abovementioned source should be given, and a footnote should be added saying that the questionnaire is reprinted with the permission of the copyright holder.
4. The copyright of the Sense of Family Coherence Questionnaire remains solely in the hands of the Executor of the Estate of Aaron Antonovsky.

If possible, I would appreciate receiving a copy of any forthcoming paper concerning a study in which the SOC questionnaire has been used, for private use in building an SOC publication database.

Sincerely,

Avishai Antonovsky, Ph.D.
Estate of Aaron Antonovsky
Department of Education and Psychology
The Open University
Israel

On behalf of Avishai Antonovsky
Monica Eriksson, PhD, Associate Professor
Department of Nursing, Health & Culture
University West, Center on Salutogenesis
Trollhättan, Sweden

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## Attatchment 2: Permission from Norwegian Social Science Data Services

**Norsk samfunnsvitenskapelig datatjeneste AS**
NORWEGIAN SOCIAL SCIENCE DATA SERVICES

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

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

Vår dato: 16.12.2014 Vår ref: 40756 / 3 / AGL Deres dato: Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 15.11.2014. All nødvendig informasjon om prosjektet forelå i sin helhet 12.12.2014. Meldingen gjelder prosjektet:

| | |
|---|---|
| *40756* | *Prosjektet vil bli skrevet på engelsk:Association between Sense of coherence and participation in a free offer of exercise for pregnant women. Oversatt: Assosiasjon mellon begrepet: Sense of coherence og deltakelse i gratistilbudet trening for gravide* |
| *Behandlingsansvarlig* | *Høgskolen i Hedmark, ved institusjonens øverste leder* |
| *Daglig ansvarlig* | *Giovanna Calogiuri* |
| *Student* | *Siv Lena Birkheim* |

Etter gjennomgang av opplysninger gitt i meldeskjemaet og øvrig dokumentasjon, finner vi at prosjektet ikke medfører meldeplikt eller konsesjonsplikt etter personopplysningslovens §§ 31 og 33.

Dersom prosjektopplegget endres i forhold til de opplysninger som ligger til grunn for vår vurdering, skal prosjektet meldes på nytt. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/meldeplikt/skjema.html.

Vedlagt følger vår begrunnelse for hvorfor prosjektet ikke er meldepliktig.

Vennlig hilsen

Katrine Utaaker Segadal

Audun Løvlie

Kontaktperson: Audun Løvlie tlf: 55 58 23 07
Vedlegg: Prosjektvurdering
Kopi: Siv Lena Birkheim sivlenas@hotmail.com

**Attatchment 3: Information and request for participation in the research project (Norwegian)**

## Informasjon og forespørsel om deltakelse i forskningsprosjekt:

Finnes det noen sammenheng mellom gravide kvinners SOC (følelse av sammenheng), nivå av fysisk aktivitet og bruk av Elverum Kommunes gratistilbud *Trening for gravide*?

Jeg er en sykepleier under videreutdanning, som for tiden jobber med min masteroppgave i Folkehelsevitenskap med vekt på livsstilsendringer, ved Høgskolen i Hedmark. Målet med studien er se om det er noen sammenhenger mellom aktivitetsnivået hos gravide, de som benytter seg av gratistilbudet *Trening for gravide*, og sosiolog Antonovskys velbrukte begrep Sense of Coherence. (Oversatt til norsk: følelse av sammenheng).

For å få innsikt i dette vil jeg spørre alle som er gravide og har kontakt med jordmor og/eller benytter seg av tilbudet *Trening for gravide*, om å svare på en spørreundersøkelse. Spørsmålene vil omhandle litt bakgrunnsinformasjon om deg, spørsmål om fysisk aktivitet og et standardisert spørreskjema om Sense of Coherence. (SOC 13) Det vil til sammen være snakk om 23 spørsmål.

Spørreundersøkelsen er anonymisert og alle personopplysninger vil bli behandlet konfidensielt. Etter endt studie vil all informasjon bli makulert. Den enkeltes svar vil ikke kunne være gjenkjennbar i en eventuell publikasjon. Forskningsprosjektet skal etter planen være avsluttet i mai 2015.

Det er helt frivillig å delta i studien. Du kan når som helst trekke deg, uten å oppgi noen grunn. Utfylling av spørreskjema kan du gjøre hvor det passer deg best. Du kan gjerne sette deg ned på helsestasjonen.

Innlevering av spørreskjema gjøres ved at den sendes i vedlagt frankert konvolutt eller leveres hos jordmor hvis du ønsker det.

Dersom du har spørsmål til forskningsprosjektet, ta gjerne kontakt med ansvarlig

Siv Lena Birkheim. Tlf: 97 09 27 40 E-mail: sivlenas@hotmail.com

Studien er meldt til Personvernforbundet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS.

## Samtykke til deltakelse i forskningsprosjektet

Jeg har mottatt informasjon om studien, og er villig til å delta. Deltakelsen er frivillig og jeg kan når som helst trekke meg, uten å oppgi årsak. (Dette arket signeres og returneres sammen med ferdigutfylt spørreskjema).

---

(Signatur av prosjektdeltaker)

## Attatchment 4: Information and request for participation in the research project (English)

## Information and request for participation in the research project:

Is there any connection between pregnant women SOC (sense of coherence), level of physical activity and use of Elverum municipality of free offers: Exercise for pregnant women?

I am a nurse in education, currently working on my Master's in Public Health at University College Hedmark.

The aim of this study is to see if there are any correlations between activity levels in pregnant women, those who make use of the free offer: Exercise for pregnant women, and sociologist Antonovsky well-worn concept: Sense of coherence. (Translated into Norwegian: sense of coherence).

To gain insight into this I would ask all those who are pregnant and contact your midwife and / or use of exercise options for pregnant women about to answer a survey. The questions will deal with some background information about yourself, questions about physical activity and a standardized questionnaire about Sense of coherence. (SOC 13) The combination will be talking about 20 questions.

The survey is anonymous and all personal information will be treated confidentially. After completing the study, all information will be destroyed. The individual responses will not be recognizable in any publication.

The research project is scheduled to be completed in May 2015.

It is voluntary to participate in the study. You may at any time withdraw, without giving any reason.

Filling in the questionnaire you can do where it suits you best. You may want to sit down at the clinic.

Submission of the survey done by the placed in the enclosed envelope. and delivered by a midwife if you can.

The envelope is prepaid, so it can also be sent directly to the researcher.

If you have any questions about the research project, please contact the responsible

Siv Lena Birkheim

Tel: 97 09 27 40

E-mail: sivlenas@hotmail.com

The study is reported to Personvernforbundet Research, Norwegian Social Science Data Services.

Consent for participation in research

I have received information about the study and are willing to participate. Participation is voluntary and I may at any time withdraw me without giving reason.

---

(Signature of project participant)

**Attatchment 5: Questionnaire (Norwegian)**

# Spørreskjema

**Del 1: Spørsmål om bakgrunn og deltakelse i trening for gravide**

Sett kryss i ruten som passer best til ditt svar.

**1.** Hvilken kategori under inneholder din alder?

- ○ Under 18
- ○ 18-25
- ○ 26-35
- ○ 36-45
- ○ Eldre enn 45

**2.** Hva er din høyeste grad av gjennomført utdanning?

- ○ Ungdomsskole
- ○ Videregående
- ○ Høgskole/bachelor
- ○ Hovedfag/master
- ○ Doktorgrad/Phd

**3.** Hva er din sivilstand?

- ○ Gift/registrert partner
- ○ Samboer/partner
- ○ Single

**4.** Hva er din etniske opprinnelse?

○ Norsk

○ Annen nasjonalitet

○ Født I Norge, men av foreldre med annen nasjonalitet (2.generasjon norsk)

**5.** Hvor mange uker gravid er du nå?

Skriv antall uker___

**6.** Hvor mange barn har du født før denne gravidteten?

○ 0

○ 1

○ 2 eller flere

**7.** Fra en skala fro 0 – 7, hvor 0 er ingen planer om å delta og 7 er stor sannsynlighet for å delta. Hvor sannsynlig er det at du kommer til delta på gratistilbudet *Trening for gravide*? Sett et strek på linjen som passer best med ditt svar.

---

0 1 2 3 4 5 6 7

Ingen planer om å delta

Stor sannsynlighet for at jeg skal delta

## Del 2 : Godin Leisure-Time Exercise questionnaire oversatt fra engelsk til Norsk og spørsmål om deltakelse av gratistilbudet *trening for gravide*

**8.** Under en vanlig 7-dagers periode (en uke), hvor mange ganger i gjennomsnitt gjør du følgende typer trening i mer enn 15 minutter når du har fri. Skriv på hver linje riktig antall

a) Anstrengende trening (Hjertet slår fort) Feks: løping, jogging, ishockey, football, squash, basketball, langrenn, judo, rulleskøyter, aktiv svømming, langtur sykkel)

Antall ganger per uke:_____

b) Moderat trening (ikke utmattende) Feks: hurtig gåtur, tennis, lett sykling, volleyball, badminton, lett svømming, alpint, dans.

Antall ganger per uke:_____

c) Lett trening (minimal innsats) Feks: Yoga, fisking, bowling, golf, lett gåtur

Antall ganger per uke:_____

**9.** Under en typisk 7- dagers periode (en uke), på din fritid, hvor ofte deltar du i en fysisk aktivitet lenge nok, så du blir svett (hjertet slår fort)?

Sett kryss ved det svaret som passer deg best.

Ofte _____

Noen ganger _____

Sjelden/Aldri _____

**10.** Har du deltatt på gratistilbudet *trening for gravide*?

Ja _____

Nei _____

## Del 3 : Sense of Coherence (SOC- 13)

Nedenfor er det noen spørsmål som angår forskjellige sider ved livet. Hvert spørsmål har 5 svaralternativer. Sett kryss ved det svaret du mener passer for deg.

**11.** Hvor ofte føler du at du egentlig ikke bryr deg om det som foregår rundt deg?

- ○ Aldri
- ○ Sjelden
- ○ Av og til
- ○ Ofte
- ○ Svært ofte

**12.** Hvor ofte har du tidligere blitt overrasket over oppførselen til folk du trodde du kjente?

- ○ Aldri
- ○ Sjelden
- ○ Av og til
- ○ Ofte
- ○ Veldig ofte

**13.** Hvor ofte har det hendt at mennesker du stolte på, har skuffet deg?

- ○ Aldri
- ○ Sjelden
- ○ Av og til
- ○ Ofte
- ○ Veldig ofte

**14.** Hvor godt tror du at du vil like tingene du kommer til å gjøre i fremtiden?

- ○ Svært dårlig
- ○ Dårlig
- ○ Sånn passe
- ○ Godt
- ○ Svært godt

**15.** Hvor ofte føler du deg urettferdig behandlet?

- ○ Aldri
- ○ Sjelden
- ○ Av og til
- ○ Ofte
- ○ Veldig ofte

**16.** Hvor ofte er du i situasjoner der du ikke vet hva du skal gjøre?

- ○ Aldri
- ○ Sjelden
- ○ Av og til
- ○ Ofte
- ○ Veldig ofte

**17.** Hvor godt liker du tingene du gjør til daglig?

- ○ Svært dårlig
- ○ Dårlig
- ○ Sånn passe
- ○ Godt
- ○ Svært godt

**18.** Hvor ofte hender det at du selv ikke forstår hva du selv føler og tenker?

- ○ Aldri
- ○ Sjelden
- ○ Av og til
- ○ Ofte
- ○ Veldig ofte

**19.** Hvor ofte hender det du har følelser og tanker du helst ikke ville hatt?

- ○ Aldri
- ○ Sjelden
- ○ Av og til
- ○ Ofte
- ○ Veldig ofte

**20.** Mange mennesker føler seg som tapere i visse situasjoner. Hvor ofte har du følt det slik?

- ○ Aldri
- ○ Sjelden
- ○ Av og til
- ○ Ofte
- ○ Veldig ofte

**21.** Hvor ofte føler du at du ikke henger med på det som skjer rundt deg?

- ○ Aldri
- ○ Sjelden
- ○ Av og til
- ○ Ofte
- ○ Veldig ofte

**22.** Hvor ofte føler du at det er lite mening med det du driver med til daglig?

- ○ Aldri
- ○ Sjelden
- ○ Av og til
- ○ Ofte
- ○ Veldig ofte

**23.** Hvor ofte hender det at du ikke har kontroll over følelsene dine?

- ○ Aldri
- ○ Sjelden
- ○ Av og til
- ○ Ofte
- ○ Veldig ofte

Dette var siste spørsmål. Legg spørreskjema og signert samtykke til deltakelse i vedlagt konvolutt og post det så snart som mulig. Svarene sendes til Høgskolen i Hedmark, merket navnet til min faglige veileder Giovanna Caliguri, men det er kun undertegnende som vil lese spørreskjemaene.

Tusen Takk for hjelpen.

Med vennlig hilsen Siv Lena Birkheim

### Attatchment 6: Questionnaire (English)

## Questionnaire:

Section1: Question about background and participation in the free offer of exercise

Put one cross in the most suitable square for each question.

1. Which category below includes your age?

- ○ Under 18
- ○ 18-25
- ○ 26-35
- ○ 36-45
- ○ Older than 45

2. What is your highest level of education completed?

- ○ Middel school
- ○ High school
- ○ Bachelor
- ○ Master
- ○ Phd

3. Marital status

- ○ Married/registered partner
- ○ Partner

○ Single

4. What is you ethnical background?

○ Norwegian

○ Other nationality, moved to Norway as a child

○ Other nationality, moved to Norway as adult

○ Norwegian second generation

5. How many weeks pregnant at the moment?

Write which week ____

6. Former child/birth:

○ 0

○ 1

○ 2 and more

The next questions are about the free offer of exercise for pregnant woman. Please put one cross on the line, best suited to tour replay.

7. From a scale from 0 - 5 where 0 is no plans to participate and 5 is completely sure to attend. How likely is it that you are going to attend the free offer training for pregnant during your pregnancy?

---

0 1 2 3 4 5 6 7

No plans complety sure to participate

## Godin Leisure-Time Exercise Questionnaire

8. 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).

Write Times Per Week

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)

b) MODERATE EXERCISE

(NOT EXHAUSTING) _____

(e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

c) MILD EXERCISE

(MINIMAL EFFORT) _____

(e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)

9. 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

10. Have you already participate in the free offer exercise for pregnant women?

○ YES

○ NO

## Sense of Coherence – Orientation to Life Questionnaire –

Short form 13 items

11. Do you have the feeling that you don't really care about what goes on around you?

○ Never

○ Seldom

○ Sometimes

○ Often

○ Very often

12. Has it happened in the past that you were surprised by the behaviour of people whom you thought you knew well?

○ Never

○ Seldom

○ Sometimes

○ Often

○ Very often

13. Has it happened that people whom you counted on disappointed you?

- ○ Never
- ○ Seldom
- ○ Sometimes
- ○ Often
- ○ Very often

14. How well do you think you will like the things you will do in the future ?

- ○ Very bad
- ○ Bad
- ○ In between
- ○ Good
- ○ Very good

15. Do you have the feeling that you're being treated unfairly?

- ○ Never
- ○ Seldom
- ○ Sometimes
- ○ Often
- ○ Very often

16. Do you have the feeling that you are in an unfamiliar situation and don't know what to do?

- ○ Never
- ○ Seldom

- ○ Sometimes
- ○ Often
- ○ Very often

17. How well do you like the things you do daily?

- ○ Very bad
- ○ Bad
- ○ In between
- ○ Good
- ○ Very good

18. Do you have very mixed-up feelings and ideas?

- ○ Never
- ○ Seldom
- ○ Sometimes
- ○ Often Very often

19. Does it happen that you have feelings inside you would rather not feel?

- ○ Never
- ○ Seldom
- ○ Sometimes
- ○ Often
- ○ Very often

20. Many people – even those with a strong character – sometimes feel like sad sacks (losers) in certain situations. How often have you felt this way in the past?

- ○ Never
- ○ Seldom
- ○ Sometimes
- ○ Often

- ○ Very often

21. How often do you feel that you are not stuck with what is happening around you?

- ○ Never
- ○ Seldom
- ○ Sometimes
- ○ Often
- ○ Very often

22. How often do you have the feeling that there's little meaning in the things you do in your daily life?

- ○ Never
- ○ Seldom
- ○ Sometimes
- ○ Often
- ○ Very often

23. How often do you have feelings that you're not sure you can keep under control?

- ○ Never
- ○ Seldom
- ○ Sometimes
- ○ Often
- ○ Very often