



**Institutionen för kost-
och idrottsvetenskap**

Does COVID-19 affect exercise habits and the motivation to perform physical activity?

**Rebecka Latoś
Johan Wahlund**

Kandidatuppsats 15 hp
Program Sports coaching
Vt 2020
Handledare: Pär Rylander
Examinator: Stefan Lindinger

Kandidatuppsats 15 hp

Titel: Does COVID-19 affect exercise habits and the motivation to perform physical activity?

Författare: Rebecka Latoś & Johan Wahlund

Program: Sport coaching

Nivå: Grundnivå/Avancerad nivå

Handledare: Pär Rylander

Examinator: Stefan Lindinger

Antal sidor: 32

Termin/år: Vt2020

Nyckelord: Self-determination Theory, motivation, COVID-19, Training.

Abstract

To summarize the results, all three groups experienced an increase in time to exercise, spent less time at the fitness centers and more outdoors. However, the larger contrast between the groups was that the *Decreased* group had more cancellation of training and closed fitness centers which gave them fewer opportunities to exercise and tended to worry more about the spread of the virus. Contrasting, the *Increased* group saw more opportunities with gained time to expand their workout routine. While the group that did *not change* had equivalent reasons from both groups for staying where they were. The total amount of training did not increase or decrease and showed no significance before and during COVID-19. However, there was a significant decrease in the number of minutes trained per workout.

Acknowledgement

We would like to thank our supervisor Pär Rylander for encouraging, helping and contributing throughout the process and the input on the essay. A big thanks to everyone who took the time to participate in the study given the prevailing circumstances. Without you, the essay would not have become a reality. We also want to thank Åsa and Lennart Cider for all the feedback and your professional help. And of course, our partners, who stood out during this process and helped us in different ways.

Table 1. Authors' contribution

Assignment	Percentage performed by Rebecka / Johan
Planning of the study	50/50
Literature research	30/70
Data collection	50/50
Analysis	35/65
Writing	50/50
Layout	30/70
Language translation	70/30

1 Introduction	4
1.2 Objective	4
1.3 Research purpose	4
2 Background	4
2.1 COVID-19	4
2.1.1 Laws, Restrictions and Recommendations	5
2.1.2 Physical activity	6
2.2 Definition of physical activity	6
2.3 Recommendations and physical activity	6
2.4 Self-reported surveys and monitored tests	7
2.5 Positive effects	7
2.6 Motivation	9
2.7 Theoretical starting point	9
3 Method	11
3.1 Research methodology	11
3.2 Selection group	11
3.3 Measuring instrument	11
3.3.1 How the survey was made	11
3.3.2 Collecting data	13
3.4 Data processing	13
3.5 Ethics	14
4 Results	15
4.1 Descriptive statistics	15
4.2 Summary	19
5 Discussion	19
5.1 Method discussion	19
5.1.1 Strengths and limitations	20
5.1.2 Validity and reliability	21
5.2 Results discussion	21
6 Conclusion	22
7 Further research	22
8 References	23
9 Appendices	26

1 Introduction

During early 2020, the world pandemic COVID-19 affected Sweden, with restrictions that have contrasted sharply from the majority of the world. The population still has much more freedom, while others have strict curfews. This naturally has a substantial effect on the extent to which persons can engage in physical activities and exercise, which is a vital component in the maintenance of physical fitness and general health. The level of physical activity impacts all physiological systems in the body and the immune system is of special importance in this pandemic.

The question then arises; how are humans affected by a world pandemic? Do we lose motivation and lean back on the couch when restrictions arise, and opportunities are limited? Or are we more motivated in taking care of our health with greater opportunities with no lockdown, that we have in Sweden?

There is no question that the level of physical activity is a major influencing factor for our health as well as for our relationship with coronavirus. But how does our relationship with our health change? There is a strong connection between physical activity and improved cognition, mental wellbeing, self-confidence thus ones' extrinsic and intrinsic motivation for physical activity. However, how does a world-pandemic, which essentially touches every sphere of life, affect the motivation to perform physical activity and exercise?

1.2 Objective

The purpose of this study was three folded. First, to investigate if frequency and duration of exercise had been affected for people living in Sweden during the COVID-19 pandemic. Second, to investigate the relationship between the participant's motivational profiles and any changes in their physical activity during the COVID-19 pandemic. Thirdly, to investigate which factors people who differed in training time before and during the pandemic saw as opportunities or obstacles for their physical activity during the pandemic.

1.3 Research purpose

- 1) Do people exercise more or less during the COVID-19 pandemic?
- 2) Is there any association between motivation profile and changes in total exercise time before and during COVID-19 pandemic?
- 3) Which factors affect people's exercise during a world pandemic?

2 Background

2.1 COVID-19

At the end of December 2019, the World Health Organization (WHO) received information from the Chinese government that an unknown virus had been confirmed in the city of Wuhan. On 7th January WHO announced to the world that they have successfully identified the virus. The virus could be linked to an earlier known family of viruses, which was the corona family, and led to the name COVID-19, also known today as the coronavirus. On 11th January the world received the news that the first confirmed death, caused by COVID-19 occurred in Wuhan. (Sveriges Television, 2020). After the first death in China, the virus has spread around

the world in a few months and several measures and restrictions have been put in place by various countries and politicians. Today the death figure has exceeded about 290,000 and reached 216 countries according to WHO (2020a).

According to WHO, COVID-19 is a new type of coronavirus and with this comes a lot of gaps of knowledge. There is a lot to learn about this virus, for example, the cure and how to reduce the spreading most effectively until we have medicine. WHO explains that COVID-19 is primarily spread through drops of saliva or string from the nose when an infected person coughs or sneezes. However, what is assessed about this virus according to WHO, is it's symptoms. One can be infected with COVID-19, but have very mild symptoms, while others may feel a slightly moderate symptom without requiring special treatment. The gap in symptoms from each individual can be huge. WHO wants to point out that some people are at greater risk if getting infected by this virus. For example, older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness (WHO, 2020b).

2.1.1 Laws, Restrictions and Recommendations

Various actions have been made around the globe to reduce the spread of COVID-19. All countries operate differently and are governed in different ways. What is also essential to add to this, is the different stages every country is in, with connection to the spreading of the coronavirus. And for those reasons, it may look different in how each country chooses to handle COVID-19. (Sanchez et al., 2020; Hopkins et al., 2020)

Within Sweden, as this study is made, the government has passed different laws, restrictions and recommendations in consultation with the *Public Health Authority (swe:Folkhälsomyndigheten)*. This is the responsible authority for public health and giving the government the right information for the various decisions that are taken to promote public health (Swedish Government, 2020a).

At the same time, the Swedish government has made a strategy made of six items. Which underlies all laws, restrictions and recommendations that benign made, with the reason of COVID-19. The first item of this strategy is (1) *Limit the spread of infection in the country*. To ensure that as many people as possible survive, as well relieving medical care in their work. (2) *Ensure resources for health care*. The government has assumed the responsibility to pay all extra costs for municipalities and regions with COVID-19. Since this should not be a threshold for being able to run a fully functioning healthcare system. (3) *Limit the impact on socially important activities*. The Government considers it important that activities such as the police, transport, food assets, health care, energy supply and more are important to maintaining. (4) *Relive the consequences for citizens and businesses*. The government offers various crisis packages to save several companies and reduce citizens' loss of income. (5) *Reduce concerns*. By providing necessary information and continuously informing about the current situation. (6) *Put the right action in place at the right time*. By following the situation and constantly creating an understanding, the government seeks to make decisions that are effective and sustainable over time (Swedish Government, 2020b)

The strategy has led to various laws, restrictions and recommendations announced by the Swedish government. The first laws regarding physical meetings came into force on 12th March. It was then forbidden within Sweden's borders to organize public gatherings or public events of over 500 people. This meant that it was criminal to carry out, for example, sporting events, dance events, markets, fairs or demonstrations and lectures of over 500 people (Swedish Government, 2020c). A law that later changed after new recommendations from the Public

Health Agency (2020a). Which made the government reduce the quota for the number of people, from 500 to 50 on 27th March (Swedish Government, 2020d).

Other strong recommendations issued both by the government, but most frequently by the Public Health Authority. Is (1) *social distancing*. (2) *Stay at home when you're sick*. (3) *Pay attention to symptoms of COVID-19*. (4) *Wash your hands frequently*. (5) *Cough and sneeze in the elbow*. (6) *Avoid touching eyes, nose and mouth*. All this in order not to infect others or to become infected yourself (Public Health Agency (2020b).

2.1.2 Physical activity

With different laws and restrictions, sports federations have been affected in different ways. For example, both the Swedish Floorball Association (*Svenska innebandyförbundet, SIBF*) and the Swedish Hockey Association (*Svenska Ishockeyförbundet, SIF*) have chosen to end the current season (SIBF, 2020), (SIF, 2020). At the same time, the Swedish Football Association (*SvFF*) is not allowed to start their season for senior players, according to the Public Health Authority. However, during this specific period the Public Health Authority allowed sports for children and adolescents to continue without any audience. The Swedish National Sports Federation (*swe:Riksidrottsförbundet*), in consultation with the Public Health Authority, has developed guidelines for how sports should safely be conducted within children and youth sports (Public Health Authority, 2020c).

In France, a recent published study that included a risk group of elderly people in quarantine showed that these people had a hard time exercising since they did not want or could not attend the classes for exercise that they had attended to before the outbreak of the Coronavirus (Goethals, et al, 2020).

2.2 Definition of physical activity

The term physical activity is a common expression regularly used, both in people's everyday lives, but also in research society. Caspersen, Powell and Christenson (1985) define physical activity as.

Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure. The energy expenditure can be measured in kilocalories. Physical activity in daily life can be categorized into occupational, sports, conditioning, household, or other activities. Exercise is a subset of physical activity that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness. Physical fitness is a set of attributes that are either health- or skill-related. The degree to which people have these attributes can be measured with specific tests. (p.126).

The above definition is well-quoted and used in a variety of different professions. In the following study, we use physical activity as an umbrella term, where we put in words as training, exercise and workout.

2.3 Recommendations and physical activity

The following recommendations concerning physical activity level are developed by Professional Associations for Physical Activity and adopted by the Swedish Medical Association on October 24, 2011.

To improve wellness and reduce the risk of cardiovascular illness, prevent premature mortality, one shall maintain or enhance physical capacity. Recreational activities such as outdoor

activities, exercise/physical training, sports and gardening, activity at work or home, and active transport in everyday life in the form of, for example; walking and cycling can be included as physical activity as well as minimum consumption of 1000 kcal/ week in adult humans should come from physical activity (FYSS, 2015).

Adults from the age of 18 are recommended to be physically active for a total of at least 150 minutes/week. The intensity level ought to be at least moderate. Recommended high intensity, at least 75 minutes/week is recommended. One can also combine the activity of moderate and high intensity. Preferably should the activity should be spread over the days of the week and carried out in workouts of at least 10 minutes. The nature of moderate-intensity gives rise to heart rate and respiration, while high intensity gives a significant increase in heart rate and respiration. For most large muscle groups in the body, muscle-strengthening physical activity should be performed at least twice a week (FYSS, 2015).

2.4 Self-reported surveys and monitored tests

The Public Health Authority (2019) recently published information concerning the physical activity level among the Swedish population. Data had been collected in 2018 and compiled with the help of various authorities in Sweden. All data was mainly collected from self-reported questionnaires. But, data in school children had been supplemented with movement meters. The result showed that 66% of all men and women, aged 18-64, met the daily recommendations on physical activity. However, in boys 23% and in girls 14%, between 11-14 years and a total of 19% met the daily recommendations on physical activity. Simultaneous, only 13% of boys and 9% of girls with a total of 11% in age of 15-17 reach the recommendations. For the oldest population 65 years and older, data gave us 54% on both men and women and therefore a total of 54%.

In a pilot study by Ekblom-Bak, et al (2015), they found different results towards the Public Health Authority. This study focused on men and women, 50-64 years represented all different socio-economic areas. Among these 7.1% of participants reached the daily recommendations for physical activity. This is a difference of 58.9% based on the 66% that the Public Health Authority (2019) found in their data. The difference between these two groups is partly the age range as well as the collection of data. Ekblom-Bak, et al. (2015) used supervised testing on their participants while the Public Health Authority used a self-reported survey for this age group.

2.5 Positive effects

Physical activity is well known to be vital for our health with therapeutic benefits (Stanner, 2004). The lack of physical activity or high sedentary has shown to increase the risk for cardiovascular diseases and a wide variety of other chronic diseases. Cancer, diabetes, obesity, heart diseases, premature death and depression are just a few out of many possible complications from inactivity (Stanner, 2004).

By implementing physical activity together with a balanced diet helps one to control their weight and prevent obesity. This balance is maintained with burning more calories than what one eats and drinks in order to lose weight. When blood sugars levels decrease together with balancing insulin levels, diabetes can be managed (Volkers & Scherder, 2011). With it being said, it is believed by many that one can stay healthy and lose weight by simply adding exercise to one's lifestyle. This interpretation of why and how exercise or physical activity can be beneficial to one's health needs clarification (Reiner, Niemann, Jekauc, & Woll, 2013).

The findings from a year-long, randomized, controlled study indicated greater significance in weight and fat loss with exercise within respondents with a stronger dedication to the exercise prescription. Additionally, a greater reduction in the intra-abdominal fat area in both women and men regular exercisers completing at least 250 min/weekly, opposed to those exercising less than that. It implies that some of the exercise's more favorable results could not have been obtained by people who only obey the minimum health recommendations (McTiernan, et al. 2007). The study confirmed results to moderate-to-vigorous exercise activity provided relevant benefits with a greater exercise duration or greater fitness gains.

By implementing physical activity as a part of one's lifestyle, circulation improves with increased blood flow as the heart strengthens (Volkers & Scherder, 2011). When oxygen levels in the body increases, heart diseases risk lower as well as blood pressure.

Studies have also shown a strong correlation between mental health, mood and exercise. One can reduce depression, anxiety, manic depression (bipolar disorder), improve one's mood as physical activity creates a chemical release in the body which allows one to relax and deal better with stress and develop concentration, according to Forsyth et al. (2015) and Volkers & Scherder (2011). This states that people can experience a reduction of stress with the help of exercise. Exercise remains moderately more effective than no therapy for reducing symptoms of depression. Additionally, it can be just as effective as psychiatric or pharmacological therapies (Cooney, et al. 2013).

Together with proteins and other chemicals that stimulate the body when in physical activity, the brains' function improves its structure. As a result, learning, thinking and overall concentration sharpens (Stanner, 2004). Exercise also helps increase cognitive performance as the hippocampal volume increases. With exercise, our brain function strengthens by activation which generates new brain cells. Regular exercise resulted in improved neuroplasticity, adaptability and productivity by improved cerebral blood flow, regulation of synaptic connections and new neuron growth. Yoga as a form of exercise has also shown verbal learning and attention increase (Lin, et al. 2015). As the mental health enhances, musculoskeletal health and well-being increases (Stanner, 2004).

It is known that cancers, such as breast, colon, lung and uterine cancer can be reduced by persistent and sustained physical activity. When reducing the risks of getting cancer; strongest evidence for colon, breast and endometrial cancer has been revealed. Physical activity in breast cancer patients has been linked with the increased natural cytolytic function of killer cells (Kenfield, Stampfer, Giovannucci, & Chan, 2011). When already having cancer, has it shown to decrease cancer in the resting natural killer cells activity during physical activity. Such findings indicate an invigorating effect of moderate physical activity as it releases chemicals to kill the cancer cell which leads it to explode (Peters, Lötzerich, Niemeier, Schüle & Uhlenbruck, 1994).

A study has also shown that people during cancer treatment experienced less pain when they performed more aerobic exercises (Volkers & Scherder, 2011).

Regular physical activity also improves bone health as it strengthens the skeleton, when in high physical stress exercises. Adding muscle-strengthening exercises results in a maintenance or growth of muscle mass (Stanner, 2004).

Considering many of the health benefits from physical activity, results from diverse research have confirmed the increase of longevity in one's life. Then, not only is physical inactivity

applying a negative impact on an individual level but public health as well (Stanner, 2004). Exercise is sometimes talked about as a miracle drug. However, with the results of what science has discovered, it can be seen as a medicine. It has shown to improve healthy people's mood soon after a workout.

2.6 Motivation

Often, we hear people speak about motivation. This in terms of telling one how motivated or unmotivated they are for a task, such as training, homework from school or simpler everyday housework such as cleaning or cooking. What this tells us is that motivation is a central part of our lives, in every task we are involved in, big as smaller tasks (Lindwall, Johnson, & Rylander, 2016).

Several theories within the research society explain to us what motivation is. What is important to understand is that motivational research is broad and complex, and a variety of theories exist to explain this particular topic. Lindwall et al (2016) tell us that in sports psychology, there is a lot of talk about the process that involves initiating, directing and maintaining. Which, in their view, means the ability of motivation to control our ability in what we choose to do, how much we do it and how often. But also, how long we can manage to keep the specific behaviour up. Another definition of motivation according to the National Encyclopedia (2020) is; *a psychological term for the factors of the individual that arouse, shape and direct behaviour towards different goals.*

Lindwall et al. (2016) tell us that motivation is a central concept in people's everyday lives. But constantly affected by various factors and therefore dynamic. A theory that explains this matter from one perspective is *Self-Determination Theory* (SDT). The definitions and theories above, are very interesting because of how central motivation is in our everyday lives and in our decisions. At the same time, it's dynamic and can be affected, which with connection to COVID-19 becomes very important as it has affected society on many different levels. Therefore, the research questions in this study are linked to motivation and will therefore be discussed and looked at from the selected theory SDT further down.

2.7 Theoretical starting point

The theoretical model for this study is *Self-Determination Theory* (SDT). And is the basis for how our measuring instruments are formed, but also how discussions and results are reflected. Therefore, this part will give the reader a broader understanding of our theoretical starting point.

For several years SDT has been built on a broad empirical ground. Having said that, SDT has many sub-theories which is; *Cognitive Evaluation Theory* (CET), *Organismic Integration Theory* (OIT), *Causality Orientations Theory* (COT), *Basic Psychological Needs Theory* (BPNT), *Goal Content Theory* (GCT) and *Relationships Motivation Theory* (RMT). What is important to understand, is that without all of those mentioned theories, Deci and Ryan, which are the scientists behind SDT, could not have created this theory (Lindwall, Stenling, & Weman-Josefsson, 2019).

Since the 1960s, SDT has gradually developed to what it is today. What's interesting to understand, is that during the 50 years it's been taking to build this strong empirical theory. SDT has never changed its core of belief what drives individuals to their behaviors (Lindwall, et al. 2019). The foundation of this whole theory is based on individuals' drive to influence

their own choices or behaviors. In other words, how do we experience the power of choices in our life or the specific tasks? This is related to self-determination which in SDT is also called (a) *autonomy*. Autonomy has a central part of people's motivation and is one of three factors, which influences motivation according to Deci and Ryan (2000). And are also adding other factors with a major impact on our behaviors in terms of motivation. Which are (b) *competence* and (c) *relatedness*. All these three categories they also called *psychological needs*.

Deci and Ryan (2000) explain *autonomy* as the feeling of freedom. And has shown that when individuals get their own space for creating, the intrinsic motivation shows positive results. Compared to when getting rewarded or paid for a specific task, the intrinsic motivation drops. They explain *competence* as the feeling of completing a task and its importance for individuals to feel contributory. When it comes to *relatedness*, it can be described as a form of relationship. How strong is the emotional relationship to the task, group or the sport? To summarize this, *relatedness* could also be explained as a sort of relationship to the environment where the task is performed. These three psychological needs have a big part in how likely we will perform in a task and how likely we will be doing it, but also for how long we will be doing it.

SDT shows us which type of motivation there are, and how sustainable it is (Lindwall, et al. 2019). According to Deci and Ryan (2000), the above factors are the basic needs which influence motivation. The motivation itself is also divided into three parts which can be seen in Figure 1; (a) *Amotivation*, (b) *Extrinsic motivation* and (c) *Intrinsic motivation*. Amotivation is when individuals have no motivation at all. Extrinsic motivation is when external factors affect individuals' behaviors. External factors can be money, candy, or other kinds of things that can be used as rewards. Intrinsic motivation is the strongest and most sustainable motivation there is in the model of SDT. Under each motivation type (Figure 1), there are also different regulations, also called *motivation regulations*. In total, there are six different kinds of motivation regulations. and these are the ones that individuals move within depending on what their motivation looks like and what influences them on the particular behavior (Deci & Ryan, 2000).

Amotivation	Extrinsic Motivation				Intrinsic Motivation
<i>Non-regulation</i>	<i>External Regulation</i>	<i>Introjected Regulation</i>	<i>Identified Regulation</i>	<i>Integrated Regulation</i>	<i>Intrinsic Regulation</i>
Lack of competence, intention, value, meaning	Get rewarded/ avoid punishment	Satisfy others, avoid bad conscience	Makes the task/mission till your own. And it's now important	Becomes one with the task. it's a part of who you are. And therefore important	Fun, comfortable, do it without any thoughts of rewards
"I'm not sure if I belong in sport environments"	"Because people close to me would get upset if I didn't exercise"	"Because I would feel bad for myself if I didn't take the time to exercise"	"Because it's a good way to develop myself and sides of me that I but value in"	"Because sports are an essential part of my life"	"Because I think it's interesting to learn how I can get better"

Figure 1. Modified model from Lindwall, Johnson & Rylander. 2016

Summarizing the psychological needs, with *autonomy*, *competence* and *relatedness* has a large impact on where an individual will feel the Intrinsic motivation or not. Deci and Ryan further explain in their article, that you can move from one regulation to another and that motivation from the perspective of SDT is dynamic.

3 Method

3.1 Research methodology

As this study aims to investigate the relationship between motivation and exercise in the context of a global pandemic, the authors of this text considered a quantitative study in the form of a cross-sectional study in forms of a survey. The first section was quantitative designed with scale issues. While the second section was quantitative with elements of open questions - qualitative (Bryman, 2011). Within the convenience sample group of the authors contacts, the method was sent out to people's Facebook inbox. 250 Facebook profiles received the invite to participate in the survey. With approaching them individually, participants could potentially feel determined to answer with a sense that their participation is of importance. The chosen data collection was made in forms of anonymous online surveys.

3.2 Selection group

The selected group for the survey were members of the Facebook group “Grannar i Torslanda”, (eng. Neighbors in Torslanda) together with a wider range of people from several neighbourhoods which were more diverse. The group “Grannar i Torslanda” contains mainly a population of middle to high social class in Gothenburg, Sweden (Lundquist, 2017). Participants younger than 15 years of age were excluded as a recommendation from “God Forskningsetik” (Vetenskapsrådet, 2017). The randomized pick of the diverse group was within one of the thesis writers contacts. The age span of those was between 23-55 years.

3.3 Measuring instrument

3.3.1 How the survey was made

The questionnaire contained three parts. The first part contained brief introductory questions which can be seen in Appendix 4. In total, there were three questions in the first part, two of which were linked to the second part. Which were the questions regarding gender and age. The third question included in this section was about where participants lived. For example, by answering the question of age, we were able to see which ones to exclude.

The second part was based on an already well-used questionnaire called the *Behavioral Regulation in Exercise Questionnaire* (BREQ). Mullan, Markland and Ingledew (1997) produced this survey to measure people's motivation in relationship training and Self-Determination Theory. Over the years, this questionnaire has been developed and today the third edition is available and therefore shortened BREQ-3. Which is also the one we used in this study. The differences between the first edition and the last one is that in BREQ-3 we find statements for all motivation regulations related to SDT. That is, *amotivation*, *external*, *identified*, *introjected*, *integrated* and *Intrinsic*. Which, in total, gave participants 24 statements to answer (Markland & Tobin, 2004). In Figure 2 each statement is paired with one motivation regulation and type of motivation. This figure is made with combined knowledge from Markland and Tobin (2004) and Wilson, Rodgers, Loitz and Scime (2006).

Amotivation	Non-regulation	I don't see why I should have to exercise
		I can't see why I should bother exercising
		I don't see the point in exercising
		I think exercising is a waste of time
Extrinsic Motivation	External Regulation	Because other people say I should
		Because others say I should
		Because others will not be pleased with me
		I feel under pressure from others
	Introjected Regulation	I feel guilty when I don't exercise
		I feel ashamed when I miss exercise
		I feel a failure when I haven't exercised
		I would feel bad about myself if I was not making time to exercise
	Identified Regulation	I value the benefits of exercise
		It's important to me to exercise regularly
		It's important to make an effort to exercise
		I get restless if I don't exercise regularly
	Integrated Regulation	I exercise because it is consistent with life goals
		I consider exercise to be part of my identity
		I consider exercise a fundamental part of who I am
		I consider exercise consistent with my values
Intrinsic Motivation	Intrinsic Regulation	I exercise because it's fun
		I enjoy my exercise sessions
		I find exercise a pleasurable activity
		I get pleasure/satisfaction from exercise

Figure 2. Modified model from Markland & Tobin, 2004; Wilson, et al, 2006

To our knowledge, the BREQ-3 has not been translated and psychometrically the Swedish language or been published in a peer reviewed journal. However, BREQ-3 has been translated from English to Swedish in a previous bachelor's thesis at the School of Gymnastics and Sport (Larsson, 2017) and this translation was used in the current study. Further, in consultation with the supervisor, the translation was discussed on several occasions, until it was approved for use and sent out (See Appendix 5).

The third part of the questionnaire was produced by our supervisor. In this section, we were interested in capturing the volume of exercise before and during COVID-19. Which is directly linked to the first question and also to the second question of this study. We were also interested in what kind of exercise the respondents practiced, both before and during the outbreak of COVID-19. The third question, where designed to see if the participants experienced any obstacles or opportunities in their training during COVID-19.

3.3.2 Collecting data

A pilot study, including 10 people was conducted to review the questionnaire applicability before it was sent out to the actual study participants.

To collect data, potential Facebook groups were discussed to reach a wide range of people in Gothenburg. When the first group “Grannar i Torslanda” was chosen because of its high number of members (14 000). The admins of the group were informed about the research and of the anonymous, confidential and voluntary nature of the survey before they were asked to accept the request. A confirmation was then received to posts to be made in this regard. A text was then sent out in conjunction with the video clip which was published in a post. Additionally, a script for the video that was published in the Facebook group was written for potential deaf members. When the desired number of respondents was not met after one week, a reminder was then sent out in the group with approval from the administrators.

After the second post was published in the Facebook group, more data was still needed to be collected. The next stage was to then reach out to a diverse group of people in one of the thesis writers Facebook contacts. To collect data on this part, the same text that was published in the Facebook group was sent out to the contacts individually in a message. A period of five days was retained until data collecting was closed for analysis.

3.4 Data processing

When all data was collected it was compiled into the Microsoft Excel version 16 (Microsoft corp, WA, USA) and then exported to *Statistical Package for Social Sciences* (SPSS) 25.0 (IBM corp, Armonk, NY, USA) for further analysis.

Nominal and ordinal data is presented as number and percent. Differences between categories were assessed using χ^2 -test. Normally distributed continuous data is presented as mean and one standard deviation and non-normally distributed data is presented as median and interquartile range. Student's T-test was used to compare data in two independent groups. Statistical significance was set to $p < 0.05$.

The first part of the process was to give some of the response options a specific number. The simple reason behind this was to make the SPSS to understand our data. For example, sexes were given a number of 1 or 2, depending on if it was a man or a woman. When all data was coded, we had to make sure that the code itself had the right meaning according to the requirements of SPSS, i.e. to code the training group of number 1 (15-29 minute training per workout) to make sure SPSS calculated the right amount of training per each individual. The same thing was made in every category that had a value. Further, an appreciation on how much the participants had been training was performed. The reason behind this was to get as close to the truth as possible. But also, a code for the SPSS to work with.

Four questions affected how much the participants trained. Where two questions concerned training before and two during COVID-19. Individuals who did not exercise were given a score of 0. At the same time as those who exercise 1-2 workouts per week, were given scores of 1.5. The same goes for those who exercised 2-3 and therefore got the average score 2.5. In total, there were six training categories where everyone got a middle value based on the number of workouts per week. The same was done with the questions that affected the number of minutes per workout. Where people who did not exercise got the score of 0. At the same time as those who exercised between 15-29 minutes, the mean value was 22.

When all data was coded and had value. SPSS was able to analyze data through Chi-Square Tests, to see significance (p) and the correlation value (r), in relation to the number of workouts and minutes per workout. Afterwards, we were interested in a Paired Sample t-test to see the mean value, standard deviation (\pm) and the significance between total training time before and during COVID-19. All 145 participants were also divided into three groups of number 0,1 or 2 depending on if they had increased, decreased or stayed on the same amount of training before as during COVID-19 for the qualitative analysis.

Another part of the process was to create an index value for each motivation regulation in BREQ-3. All 24 questions were linked to one of the six regulations (Figure 2). This was done by adding all questions in each motivation regulation together and therefore divide the amount of questions (4). This was done by Descriptive statistics in SPSS and gave mean and standard deviation to each regulation. Also, the number where multiplied by the predetermined weighted value (Amotivation = -3. External = -2. Introjected = -1. Identified = +1. Integrated = +2. Intrinsic = + 3) and gave us a motivation profile (i.e. Relative autonomy index) overall relation to participants training. After all variables where made and analyzed, Relative autonomy index and the variable difference in total training time before and during COVID-19, where correlated. To see how strong the correlation was and see if there was any significance.

To analyze the qualitative data to produce results for the third section, an analysis was made where data was divided in SPSS, between those who "decrease in total workout length", "no change in total workout length" and "increase in total workout length". Then, each group got a number for the ranking of data from the answers. Afterwards, a qualitative content analysis was used. It is a systematic coding process for research methods in qualitative text analysis received data through and defining themes or patterns to be identified. This section with elements of open questions was interpreted, item by item as Meaning units - Condensed meaning units - Codes - Theme/Category (Graneheim & Lundman, 2004).

Afterwards, a qualitative content analysis was used. It is a systematic coding process for research methods in qualitative text analysis where data is received and defining themes or patterns are to be identified. This section with elements of open questions was interpreted, item by item as Meaning units - Condensed meaning units - Codes - Theme/Category (Graneheim & Lundman, 2004).

An example on a Meaning unit is: "I've been closer to nature and parks therefore running and trail running has been easier to access." The next step of the process is Condensed meaning units: "closer to nature and parks", "running and trail running" and "easier to access". Thereafter, coding is performed as: "nature", "running" and "easier access". The last part of the analysis is to identify a Theme or a Category. In this case, the theme could be: "Increased accessibility for running outdoors".

3.5 Ethics

As the survey was shared online, participants were informed in the presentation video and within the text in the surveys about their freedom of participation (Bryman, 2011). By participating in the survey, participants agree to contribute their answers, and that their responses would be anonymous together with confidentiality and consensus. Participants were also informed that the collected data from the surveys were only to be used for the scientific purpose and solely for the writing of this thesis. Individual information from the data would not be accessible for anyone else than the researchers and followed by research ethics

(Vetenskapsrådet, 2017). Participants could decide to fill in their email address at the end of the survey if they chose to take part in the thesis upon academic approval.

4 Results

The overall purpose of this study was to study people's total training time before and during COVID-19. And see if motivation played a part. And to understand what obstacles or opportunities had been created in people's training during COVID-19. This section will first provide a descriptive overview of the statistics, to give the reader a better understanding of who this study has analyzed data on. Thereafter, each research question will be dealt with separately.

4.1 Descriptive statistics

Background information: A total of 145 people participated in the study, 92 women and 53 men. The age ranged from 15 to 78 and the average age was 39.3 ± 13.2 years and with a median age of 37 years. Four people did not declare their age. The majority of participants came from Western Hisingen (Figure 3) and the most common forms of exercise were strength training, walking and running (Figure 4)

Location of the participants

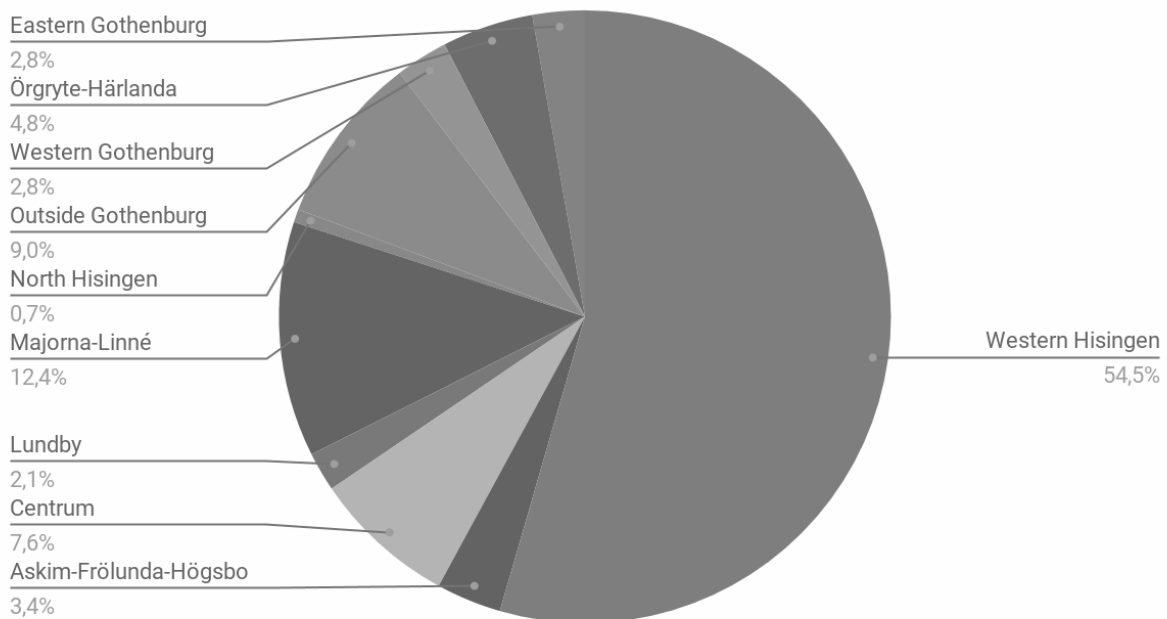


Figure 3. Location of the participants in percentage

Type of training of participants before COVID-19

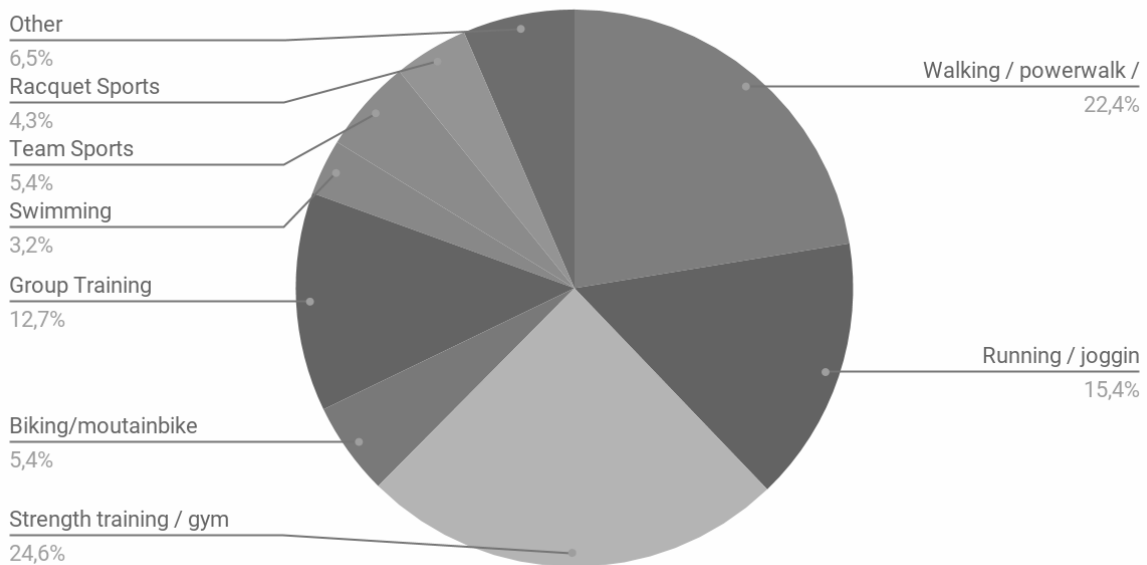


Figure 4. All types of training participants mentioned before COVID-19 as a percentage

Variable used in the study: In terms of the participants motivational profile towards training (i.e., Relative autonomy index), their self-determined motivation ranged from -7.5 to 24 points with a mean of 14.5 (± 6.4) points. The mean values for each motivation regulation index and standard deviation are shown in Table 1. The mean and standard deviation in *amotivation* and *External regulations* are low and increases in the other motivation regulations. Which might indicate the willingness to perform training on a group level.

Motivation index and profile				
	Minimum	Maximum	Mean	Std. Deviation
Amotivation	.00	2.50	.10	.30
External	.00	3.75	.40	.64
Introjected	.00	4.00	2.04	1.0
Identified	.00	4.00	2.97	.86
Integrated	.00	4.00	2.73	1.15
Intrinsic	.00	4.00	3.08	.99
Relative autonomy index	-7.50	24.00	14.53	6.38

Table 1. Each motivation index and the motivation profile - Relative autonomy index

In table 2 the number of workouts before and during COVID-19 are shown. The most common form of training, seen from the number of workouts, was 2-3 workouts per week and 4-5. These categories of workouts also had the largest decrease during COVID-19.

Table 3 shows average time per workout. Here 45-59 minutes per workout and 60-74 minutes were most common before COVID-19 and these two categories also had the largest decreases during the COVID-19.

In relation to the total amount of time in training per week, the participants, on average, engaged in 178 (± 131) minutes/week before COVID-19 and 175 (± 150) minutes/week during. In total, 46 participants had decreased in their total training time, 63 participants remained at the same level and 36 participants had increased the total amount of training.

Number of workouts per week		
Number of workouts	Number of Workouts during COVID-19	Number of Workouts before COVID-19
0	8	7
1-2	28	27
2-3	37	45
4-5	47	42
6-7	18	19
8+	7	5
Total	145	145

Table 2. Average number of workout/weeks, divided in groups

Average minutes per workout		
	Workouts during COVID-19	Workouts before COVID-19
Non training	8	6
15-29 min	16	7
30-44 min	28	22
45-59 min	52	65
60-74 min	24	30
75-89 min	10	10
90 min +	7	5
Total	145	145

Tabell 3. Average time per workout, divided in groups

Research question 1

In the first question, we were interested to see how people's training had been affected by COVID-19. The results showed that the *number of workouts* before and during did not differ significantly ($\chi^2 = 3.050$, $df = 5$, $p = .692$). For the variable *training time per workout*, there was a significant difference ($\chi^2 = 18.474$, $df = 6$, $p = .05$) as the participants engaged in shorter sessions during the COVID-19.

Total training time per week, decreased 3.2 minutes during compared to before COVID-19. This difference, however, was not significant ($p = .757$).

Research question 2

The second question this study seeks to answer concerns any relationship between total training time before and during COVID-19 and the motivation profile. Total training time and *Relative autonomy index* showed a weak correlation ($r = .120$) but which was not significant ($p = 0.151$). This is not surprising, given that there was no significant difference between before and during COVID-19 in total training time.

Research question 3

As there were no significant differences between the number of workouts per week or in total training time per week before and during the COVID-19, the qualitative data was analyzed with a point of departure in the time per workout variable. Here the participants were divided into three groups based on whether they had decreased, increased or had no change in their time per session before and during the COVID-19. Below we present the results for each of the three categories followed by a short summary.

When compiling the qualitative data with a *Qualitative Content Analysis*, answers were divided into three groups: *Decrease*, *no change*, and *Increase* in time per workout.

Decrease in total workout length

Respondents who presented a decrease in their motivation to physical activity felt that the effect from COVID-19 resulted in gyms reducing the scale of groups and the number of fitness classes which made it difficult to practice social distancing. They also faced fewer opportunities as team sports clubs and yoga studios closed. This led to a deficiency of available exercise opportunities and motivation.

However, they experienced an increase in accessibility for physical activities outdoors and at home due to more time. Several participants gave an ambiguous answer such as; Fewer people were training in the gym area. Furthermore, the results showed a positive trend towards outdoor running as well as the experience of comfort to practice at home.

No change in total workout length

The negative effect of COVID-19 was that gyms and team sports clubs cancelled training sessions or closed completely. Participants started to practice social distancing to avoid the spread of the virus and spent more time outdoors. The decrease in time spent with activities indoors was compensated with activities outdoors, resulting in a no net change in workout length.

Increase in total workout length

Participants who saw an increase in time spent for physical activity responded that COVID-19 gave rise to more time and higher accessibility. The frequency of physical activity increased

even though they spent less time at the gym to avoid spreading the virus. A trend of people working from home or being laid off from their jobs resulted in a positive effect on the motivation for their physical activity according to their responses in the open questions. Moreover, they experienced fewer people training at the gym, which again is an ambiguous answer but may mean that they have higher motivations to continue exercising.

To summarize the results, all three groups experienced an increase in time to exercise, spent less time at the fitness centers and more outdoors. However, the larger contrast between the groups was that the *Decreased* group experienced fewer opportunities due to cancelled sessions and closed fitness centers, and a tendency to worry more about spreading the virus. In contrast, the *Increased* group saw more opportunities with gained time to expand their workout routine. While the group that did *not change* had equivalent reasons from both groups for staying where they were.

4.2 Summary

There was no significant difference in total training time before or during COVID-19. However, there was a significant difference ($p=.005$) in the fact that the exercise time had decreased in the individual training session. Which was eliminated when it then multiplied by the number of workouts per week. The significance of the motivation for the total exercise did not show any strong significance (0.151) and a weak correlation (0.12).

However, the open answers in the qualitative results showed that those who had a decrease in total workout length experienced challenges such as fewer opportunities to attend group classes, practice social distancing and had sports clubs and training cancelled. The group with no change in total workout length tended to be more cautious with virus spreading, however, exercised more frequently outdoors. The group which gained in total workout length displayed an increase in the number of exercise sessions as they had greater opportunities and more time.

5 Discussion

5.1 Method discussion

Participants chosen for the online survey were members of the Facebook-group “Grannar i Torslanda” as well as a wider range of people from several neighbourhoods which were more diverse. The group and participants chosen made the convenience sample of participants simple as they could decide if and when they wanted to participate without informing us. However, to publish the survey in the group, it needed to be approved by the administrators of the group as well as negotiate when and if it was allowed to send out a reminder to the group. The published text together with the survey link in the Facebook group “Grannar i Torslanda” had also a video attached to it. The video contained a presentation and short information about us and our research. With the video presenting the writers and researchers behind this study, it might give participants' a greater confidence and trust in us. This could then lead to a greater chance for more participation, equivalent to larger data collection. Amongst the contacts sent out to the ones living in Gothenburg, preferably contrasted from Torslanda, to attain a wide general group of individuals, to spread towards a wide age span as well as gender, ethical background and social class.

The study is based on self-reported data BREQ-3 has been granted much evidence in the field of sports science and is strongly focused on SDT. This made the survey a logical choice

(Markland & Tobin, 2004). Further, in the second part of the survey, participants had to estimate their training, which can be considered from the background having their problems in confidence as one often tends to evaluate one's exercise as greater than what it actually might be.

When choosing this type of survey, there is a possible chance that the result has been affected by the system it is structured with. In the first part (Appendix 4) of the survey operated as an introduction together with three questions; age, gender and their home-neighbourhood in Gothenburg. The second part (Appendix 5, BREQ-3) of the survey questions were of a quantitative structure, 24 questions with each presented together with a 5-degree scale.

Several of these questions sounded very similar and made both us as researchers and the participants somewhat confused about the difference between the questions, which appeared when we did the pilot study before the official handout. However, an online survey as this is appropriate for collecting a large amount of data to our purpose of this research – a view of how a wider group of people in the society are being affected. In addition, online surveys were possibly the best choice to collect data from people during a world pandemic. This method was seen to be most suitable to receive large data as it increases the reliability and correlations between the components.

The third part (Appendix 6) of the survey contained quantitative self-written questions with elements of qualitative open questions. In this section, participants were given questions to reflect over how their physical activity has been affected by the world pandemic COVID-19. To combine all these parts of the survey was considered valuable in achieving the study's intent. This was an accessible option as the research was implemented during the COVID-19 pandemic. Correspondingly, to receive comparable answers, a survey such as this gives a smaller chance of outline and response errors.

5.1.1 Strengths and limitations

One limitation of self-reported data within surveys is that participants may have their training, physical activity and/or sedentary being under- or over-reported. Using more objective measurement techniques could avoid this. Yet, there were no resources or time to conduct such a report.

As the second part contained an even number of choices, it allows one to respond in the middle (number 3) when not being completely sure on what to write. This might have given a less honest answer from the participants. Whereas, a 6-degree scale might have given a more controlled and slightly changed answer, leaning towards a dominant side. It might have been easier to compile data if all questions were closed instead of some in the form of open questions. Still, to get the data we were searching for, we believe that having certain questions open was vital for the understanding of people's motivation in physical activity during the world pandemic.

A method such as this made it difficult to get participants online. Another challenge when reaching out to people on Facebook was that not all neighbourhoods had a Facebook group and therefore it is difficult to reach the whole of Gothenburg. Which then led to the second plan where surveys were individually sent out to our contacts in diverse neighbourhoods to get a wide range of participants.

Furthermore, other complications with our method were the difficulty to get approval from admins to send our survey out in Facebook groups. The number of questions might also be a

possible insufferable factor for the participants to participate. Our self-written questions might have affected the result when questions were asked in a certain way, for example in how much they trained and not through categories. Perhaps it would be easier to gain further accurate data if all participants would estimate their amount of exercise themselves instead of defined categories. However, this method possibly secures any misinterpretation.

Potential strengths would be that participants could view the survey online without our presence, which then could mirror a perception of no obligation to if and how one answers. The advantages of self-estimated data versus monitored are that it is in distribution to get more answers, which we were interested in.

5.1.2 Validity and reliability

When reviewing validity, researchers revise what measurements a study has taken, or what is asked for in a test that has strong validity (Djurfeldt, Larsson & Stjärnhagen, 2012). How the questionnaire responses are measured, that is, how significant and reliable they are, is involved within reliability.

The questionnaire of its third edition, is a well-tested questionnaire, which confirms a high validity, called the Behavioral Regulation in Exercise Questionnaire, as previously mentioned, has been used in this study. The survey is one of the most commonly used methods of evaluating behavioural regulation in physically active individuals, showing high validity, and strengthening the validity of the survey after confirmatory factor analysis in earlier research (Markland & Tobin 2004).

5.2 Results discussion

What has driven the components to its actual result might have several reasons. As COVID-19 started to spread in Sweden, schools were ordered to close temporarily. Physical education was therefore limited. At the same time, the majority of the country's sports associations stopped being active together with several fitness centers, which could be a factor in the results for people to change their workout behaviour. This factor could go both ways; either people would be less active as their opportunities in earlier habits of exercise changed and a lack of ideas or possibilities took place. For example, where parents do not have to drive their children to activities and might have to spend more time caring for them. On the other spectrum, some people took the opportunity to be more active with the sudden increase in leisure time. Some started to work from home or had to be laid off from jobs. As schedules vanished or were more flexible, one could find preferred suitable hours and increase their time for physical activity. All the hypothesized components above showed in our results and was the biggest differentiating factor pre and post COVID-19, hence why the qualitative results were summarized in total workout length.

What also might have been an affecting factor is the weather. As COVID-19 started to impinge on Sweden, the season was changing to summer, and the weather was on average very stable. People had the option to take more walks and runs in nature, motivating them with more possibilities to socialize and move outside of their original indoor venues. If the weather wouldn't have been as good as that of spring 2020, the result of this study may most likely have presented itself very differently.

Apart from that, other more common varieties of flu which are present during the colder periods in Sweden might perhaps have decreased, such as the winter vomiting disease. Due to people practicing a higher level of attention to hygiene, allied with social distancing, the winter

vomiting disease may have been controlled to a greater degree. The disease lasts for only a couple of days and people can then get back to physical activities.

Lastly, the results may not be a true representation of the broad spectrum of people with different levels of motivation, as the ones who were motivated enough to answer the survey may be those who already have a high degree of self-determination.

With a closer look at the result. It showed in the first research question that we cannot see any difference either before or during COVID-19, in relation to the total amount of exercise. Despite the fact that there have been a number of changes in laws, restrictions and recommendations. That has affected individuals' everyday lives. It can also be argued that the participants had a relatively high mean value in the motivation profile. Which, however, should not be seen as the whole truth, but showed that Deci and Ryan's (2000) theory of SDT is consistent with these findings. Another important aspect is that the majority of all participants lived in Western Hisingen, and probably in the area of Torslanda. Because that's where the questionnaire was sent out. According to Lundquist (2017), Torslanda is a socioeconomically strong area. Which probably had a big impact on the result. Because a strong social economy is linked to a larger amount of training (Centrum för idrottsforskning, 2019).

6 Conclusion

The conclusions we can draw from this study are that the total amount of training did not increase or decrease and showed no significance before and during COVID-19. Therefore, it was also difficult to see a correlation or significance between this variable and the motivation profile. However, there was a significant decrease in the number of minutes trained per workout. At the same time as the results of the qualitative data, showed an impact on individuals exercise routines during COVID-19. Those who had increased their training time per workout during COVID-19 were more likely to find solutions to maintaining their training. At the same time, those who decreased in their exercise time did not have the same solutions to continue their training.

Several other conclusions can be drawn. The limited number of participants and the socio-economic background is not representative of an entire population. Therefore, a larger study is needed. To be able to draw proper conclusions and see if there is any significant difference in the total amount of exercise. Therefore, correlate it with a motivation profile and see if there is a significance.

7 Further research

Research using both qualitative and quantitative methods within world pandemics in the light of physical activity level and exercise behaviour, would be of benefit to understand the effects on human behaviour focusing on physically and physiologically impacts. Further research in motivation on physical activity is not only vital for the already active population but then, to globally study how important and beneficial it is to continuously take care of one's health. Interesting research would be to analyze how the results from this research applied with motivation among employees who transitioned from working in an office to work at home were affected. Moreover, to observe if there is a correlation between genders and the forms of motivation.

8 References

- Bryman, Alan. (2011), *Samhällsvetenskapliga metoder*. Malmö: Liber
- Caspersen, C., Powell, K., & Christenson, G. (1985). Physical Activity, Exercise, and Physical Fitness: Definitions and Distinctions for Health-Related Research. *Public Health Reports (1974-)*, 100(2), 126-131.
- Centrum för idrottsforskning. (2019). *Idrotten och (o)jämligheten; I medlemmarnas eller samhällets intresse?*. Hämtad från Centrum för idrottsforskning: www.centrumforidrottsforskning.se
- Cooney, G. M., Dwan, K., Greig, C. A., Lawlor, D. A., Rimer, J., Waugh, F. R., McMurdo, M., & Mead, G. E. (2013). Exercise for depression. *The Cochrane database of systematic reviews*, (9), CD004366. <https://doi.org/10.1002/14651858.CD004366.pub6>
- Deci, E., & Ryan, R. (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry*, 11(4), 227-268.
- Djurfeldt, G., Larsson, R., & Stjärnhagen, O. (2010). *Statistisk verktygslåda samhällsvetenskaplig orsaksanalys med kvantitativa metoder* (2 uppl.). Lund: Studentlitteratur.
- Stanner, S. (2004). At Least Five a Week – a summary of the report from the Chief Medical Officer on physical activity. *British Nutrition Foundation Nutrition Bulletin*. London, UK. 29, 350–352.
- Eklom-Bak E, Olsson G, Eklom Ö, Eklom B, Bergström G, Börjesson M (2015) The Daily Movement Pattern and Fulfilment of Physical Activity Recommendations in Swedish Middle-Aged Adults: The SCAPIS Pilot Study. *PLoS ONE* 10(5): e0126336. doi:10.1371/journal.pone.0126336
- Folkhälsomyndigheten. (2020c). *Föreskrifter och allmänna råd om allas ansvar att förhindra smitta av covid-19 m.m.* Retrieved 2020-05-20 from www.folkhalsomyndigheten.se
- Folkhälsomyndigheten. (2020a). *Förslag: Ytterligare begränsningar av allmänna sammankomster*. Retrieved 2020-05-15 from www.folkhalsomyndigheten.se
- Folkhälsomyndigheten. (2020b). *Skydda dig och andra* from *smittspridning*. Retrieved 2020-05-15 from www.folkhalsomyndigheten.se
- Folkhälsomyndigheten. (2019). *Sverige. Fysisk aktivitet 2018*. Retrieved 2020-05-22 from www.folkhalsomyndigheten.se
- FYSS. (2015). *Rekommendationer om fysisk aktivitet för vuxna*. Stockholm: Yrkesföreningar för Fysisk Aktivitet (YFA).
- Goethals, L., Barth, N., Guyot, J., Hupin, D., Celarier, T., & Bongue, B. (2020). Impact of Home Quarantine on Physical Activity Among Older Adults Living at Home During the COVID-19 Pandemic: Qualitative Interview Study. *JMIR Aging*, 3(1), E19007.

Graneheim, U., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ. Today* 2004; 24: 105– 112.

Hopkins J, Hayasaki E, Zastrow M, Pulla P, Smith P, Garcia A.R. (2020) Covid-19: how doctors and healthcare systems are tackling coronavirus worldwide. *BMJ*, 2020;368:m1090 doi: <https://doi.org/10.1136/bmj.m1090>

Forsyth, A., Deane, F. P., & Williams, P. (2015). A lifestyle intervention for primary care patients with depression and anxiety: a randomised controlled trial. *Psychiatry Res.* 230(2):537–44. doi:[10.1016/j.psychres.2015.10.001](https://doi.org/10.1016/j.psychres.2015.10.001)

Kenfield, S. A., Stampfer, M. J., Giovannucci, E., & Chan, J. M. (2011). Physical activity and survival after prostate cancer diagnosis in the health professionals follow-up study. *Journal of Clinical Oncology.* 29:726–732. doi:[10.1200/JCO.2010.31.5226](https://doi.org/10.1200/JCO.2010.31.5226)

Larsson, M. (2017) *Motivationsfaktorer till fortsatt högintensiv träning* (Kandidatuppsats). Stockholm: Institutionen för idrotts- och hälsovetenskap, Gymnastik- och idrottshögskolan. Hämtad från <http://www.diva-portal.org/smash/get/diva2:1103636/FULLTEXT01.pdf>

Lin, J., Chan, S. K. W., Lee, E. H. M., Chung Chang, W., Tse, M., Weizhong Su, W., ...Chen, E. Y. H. (2015) Aerobic exercise and yoga improve neurocognitive function in women with early psychosis. *NPJ Schizophrenia* 1, (15047).

Lindwall, Magnus, Johnson, Urban, & Rylander, Pär. (2016). *Gruppdynamik inom idrott - Nycklar till världens bästa lag.*

Lindwall, M., Stenling, A., & Weman-Josefsson, K. (2019). *Motivation inom träning, hälsa och idrott : Ett självbestämmande perspektiv* (Upplaga 1 ed.).

Lundquist, &., & Göteborgs Stad. (2017). *Jämlikhetsrapporten 2017 : Skillnader i livsvillkor i Göteborg.*

McTiernan, A., Sorensen, B., Irwin, M.L., Morgan, A., Yasui, Y., Rudolph, R.E., ... & Potter, J.D. (2007), Exercise Effect on Weight and Body Fat in Men and Women. *Obesity*, 15:1496-1512. doi:10.1038/oby.2007.178.

Markland, David, & Tobin, Vanessa. (2004). A modification to the behavioural regulation in exercise questionnaire to include an assessment of amotivation. *Journal of Sport & Exercise Psychology*, 26(2), 191-196.

Motivation. (2020). I *Nationalencyklopedin*. Hämtad 2020-05-23 från <https://www.ne.se/uppslagsverk/encyklopedi/l%C3%A5ng/motivation>

Mullan, E., Markland, D., & Ingledew, D. (1997). A graded conceptualisation of self-determination in the regulation of exercise behaviour: Development of a measure using confirmatory factor analytic procedures. *Personality and Individual Differences*, 23(5), 745-752.

Peters, C., Lötzerich, H., Niemeier, B., Schüle, K., & Uhlenbruck, G. (1994). Influence of a moderate exercise training on natural killer cytotoxicity and personality traits in cancer patients. *Anticancer Research*. 14:1033–1036.

Reiner, M., Niermann, C., Jekauc, D., & Woll, A. (2013). Long-term health benefits of physical activity—a systematic review of longitudinal studies. *BMC Public Health*. 13:813.

Sanchez, T., Bahrami, M., Basch, C., Oksanen, A., Kaakinen, M., Latikka, R., . . . Koivula, A. (2020). Regulation and Trust: 3-Month Follow-up Study on COVID-19 Mortality in 25 European Countries. *JMIR Public Health and Surveillance*, 6(2), E19218.

Stanner, S. (2004). At Least Five a Week – a summary of the report from the Chief Medical Officer on physical activity. *British Nutrition Foundation Nutrition Bulletin*. London, UK. 29, 350–352.

Svenska Innebandyförbundet. *Information gällande coronavirus*. Retrieved 2020-05-20 from www.innebandy.se

Svenska Ishockeyförbundet. (2020). *Svenska Ishockeyförbundets styrelse har enhälligt beslutat att avsluta säsongen 2019/2020*. Retrieved 2020-05-20 from www.swehockey.se

Sveriges regering. (2020). *Förbud mot allmänna sammankomster eller offentliga tillställningar med fler än 50 deltagare*. Retrieved 2020-05-15 from www.regeringen.se

Sveriges regering. (2020). *Förordning om förbud mot att hålla allmänna sammankomster och offentliga tillställningar*. Retrieved 2020-05-15 from www.regeringen.se

Sveriges regering. (2020). *Regeringens arbete med anledning av nya coronaviruset*. Retrieved 2020-05-15 from www.regeringen.se

Sveriges regering. (2020). *Strategi med anledning av det nya coronaviruset*. Retrieved 2020-05-15 from www.regeringen.se

Sveriges Television. (2020). *Tidslinje: Tre månaders sedan första dödsfallet*. Retrieved 2020-05-14 from www.svt.se/nyheter/utrikes/tidslinje-tre-manader-sen-forsta-dods-fallet

Vetenskapsrådet. (2017). *God forskningssed*. Stockholm: Vetenskapsrådet.

Volkers, K. M. & Scherder, E. J. (2011). The effect of regular walks on various health aspects in older people with dementia: Protocol of a randomized-controlled trial. *BMC Geriatrics* 11 (38) 1-11.

Wilson, P., Rodgers, W., Loitz, C., & Scime, G. (2006). “It's Who I Am ... Really!” The Importance of Integrated Regulation in Exercise Contexts¹. *Journal of Applied Biobehavioral Research*, 11(2), 79-104.

World Health Organization. (2020b). *Coronavirus*. Retrieved 2020-05-20 from <https://covid19.who.int/>

World Health Organization. (2020a). *WHO Coronavirus Disease (COVID-19) Dashboard*. Retrieved 2020-05-14 from <https://covid19.who.int/>

List of appendices

1. Script for video
2. Presentation
3. Presentation and information outside the group
4. Survey - part 1
5. Survey - part 2
6. Survey - part 3
7. Qualitative content analysis

9 Appendices

Appendix 1

Script for the video that was published in the Facebook group

Johan: *Hej, vi vill veta hur pågående Coronapandemi har påverkat din vardag. Mitt namn är Johan Wahlund.*

Rebecka: *Och jag heter Rebecka Latós. Vi pluggar idrottsvetenskap och ledarskap på Göteborgs Universitet. Just nu skriver vi vår kandidatuppsats och när vi alla sitter lite mer hemma, så hoppas vi ni skulle kunna lägga några minuter på att svara på våran enkät.*

Johan: *Den här enkäten är helt anonym och i samband med att vårt arbete blir godkänt, kommer all data att förstöras.*

Eftertext: *Tack på förhand*

Appendix 2

Text sent out in conjunction with the video clip

Hej på er!

Våra namn är Johan Wahlund och Rebecka Latoś och vi pluggar idrottsvetenskap och ledarskap på Göteborgs Universitet.

Vi har gjort en enkät för vårt arbete med kandidatuppsatsen. Den tar ca 7 minuter att besvara och vet att många av oss har lite mer tid i och med rådande situation. Se videon nedan för mer information och klicka in på enkäten för att delta.

Länk till enkät: ...

Appendix 3

Text sent to people outside the Facebook group

Hej Göteborg!

Jag och min uppsatspartner pluggar idrottsvetenskap och ledarskap på Göteborgs Universitet.

Vi är intresserad av hur din vardag har påverkats utav nuvarande situation gällande COVID-19. Vi vet att flera sitter hemma och kanske har lite mer tid och därför kunna besvara denna enkät som tar 6-7 minuter.

Du är helt anonym i denna enkät och all data kommer också att förstöras när uppsatsen är godkänd.

Tack på förhand!

Länk till enkät: ...

Survey, part 1

Introduction text:

Denna enkät innehåller frågor och påståenden. Med hjälp av dem vill vi ta reda på hur din vardag ser ut, i form av FYSISK AKTIVITET under dessa tider med hårdare restriktioner från myndigheterna. Enkäten tar ca 6 minuter att svara på och som deltagare i enkäten kommer du att vara helt anonym. Svaren som kommer in, kommer studeras i sin helhet och därför inte kunna spåras till just dig. Efter godkänt arbete kommer också all data att raderas.

Till varje påstående kommer en 0–4 skala där du ska kryssa i det nummer som passar bäst in på dig. Kryssa för siffran "0" om detta påstående inte passar in alls på dig, och siffran "4" om påståendet passar väldigt bra in på dig. Skulle påståendet passa delvis in på dig väljer du mellan siffrorna "1", "2" eller "3" beroende på hur starkt påståendet passar in på dig. Alla svar är obligatoriska för att kunna ta sig vidare till del två i denna enkät.

Var vänlig och läs frågorna noggrant och svara så sanningsenligt du bara kan. Tänk på att det inte finns några "rätt" eller "fel" svar utan det är hur du tycker som är det viktiga.

Introduction questions

1. Kön

- Man
- Kvinna
- Annat

2. Ålder

- Öppet svar

3. Vilken stadsdel bor du i?

- Utanför Göteborg
- Västra Hisingen
- Norra Hisingen
- Lundby
- Angered
- Västra Göteborg
- Östra Göteborg
- Askim-Frölunda-Högsbo
- Majorna-Linné
- Centrum
- Örgryte-Härlanda

Appendix 5

Survey, part 2, BREQ-3

Förklaring av begrepp

Begreppet: Fysisk träning

Planerad och strukturerad fysisk aktivitet som syftar till att bibehålla eller förbättra fysisk "fitness" såsom kondition och styrka. Innebär oftast ombyte till träningskläder.

Frågor

(Notis: Alla svar innehöll en 5-gradig skala som deltagarna fick svara efter)

1. Det är viktigt för mig att träna regelbundet
2. Jag förstår inte varför jag borde träna
3. Jag tränar för att det är roligt
4. Jag får dåligt samvete om jag inte tränar
5. Jag tränar för att det är förenligt med mina livsmål
6. Jag tränar för att andra människor säger att jag borde
7. Jag värdesätter fördelarna med att träna
8. Jag kan inte förstå varför jag skulle bry mig om att träna
9. Jag har roligt under mina träningspass
10. Jag känner mig ångerfull när jag missar ett träningspass
11. Jag ser träning som en del av min identitet
12. Jag deltar i träning för att mina vänner/familj/partner säger att jag borde
13. Jag tycker det är viktigt att göra lite uppoffringar för att kunna träna regelbundet
14. Jag ser inte meningen med att träna
15. Jag anser att träning är en tillfredställande aktivitet
16. Jag känner mig misslyckad när jag inte har tränat på ett tag
17. Jag ser träning som en viktig del av vem jag är
18. Jag tränar för att andra skulle bli missnöjda med mig om jag inte gjorde de
19. Jag blir rastlös om jag inte tränar regelbundet
20. Jag tycker träning är slöseri med tid
21. Jag känner nöje och tillfredställelse av att delta i träning
22. Jag skulle tycka illa om mig själv om jag inte tog mig tid för träning
23. Jag ser träning som något som är förenligt med mina värderingar
24. Jag känner mig pressad från mina vänner/familj till att träna

Appendix 6

Survey, part 3, Own questions linked to the question

Beskrivning av begrepp

Begreppet: Fysisk träning

Planerad och strukturerad fysisk aktivitet som syftar till att bibehålla eller förbättra fysisk "fitness" såsom kondition och styrka. Innebär oftast ombyte till träningskläder.

1. Hur väl stämmer dessa påståenden in på dig INNAN Coronapandemin?

Jag tränade i snitt...

- Tränade inte alls*
- Ca. 1–2 träningspass i veckan*
- Ca. 2–3 träningspass i veckan*
- Ca. 4–5 träningspass i veckan*
- Ca. 6–7 träningspass i veckan*
- Över 8 träningspass i veckan*

2. Hur väl stämmer dessa påståenden in på dig INNAN Coronapandemin?

Jag tränade i snitt...

- Tränade inte alls*
- Ca. 15-29 minuter per träningspass*
- Ca. 30-44 minuter per träningspass*
- Ca. 45-59 minuter per träningspass*
- Ca. 60-74 minuter per träningspass*
- Ca. 75-89 minuter per träningspass*
- Över 90 minuter per träningspass*

3. Vilken typ av träning utövade du INNAN Coronapandemin?

Flera svar är möjligt

- Gång/promenad/power walk/ stavgång*
- Löpning/jogging*
- Styrketräning/gym*
- Cykel/mountainbike*
- Gruppträning (aerobics, gympa, step, zumba o.dyl.)*
- Simning*
- Lagidrott (Fotboll, innebandy, hockey, handboll o.dyl.)*
- Racketsport (Tennis, paddel, badminton, pingis, o.dyl.)*
- Annat*

4. Ifall du svarade "Annat", fyll då i vilken typ av träning nedan.

5. Hur väl stämmer dessa påståenden in på dig UNDER Coronapandemin?

Jag tränar i snitt...

- Tränar inte alls*
- Ca. 1–2 träningspass i veckan*
- Ca. 2–3 träningspass i veckan*
- Ca. 4–5 träningspass i veckan*
- Ca. 6–7 träningspass i veckan*

- *Över 8 träningspass i veckan*

6. *Hur väl stämmer dessa påståenden in på dig UNDER Coronapandemin?*

Jag tränar i snitt...

- *Tränar inte alls*
- *Ca. 15-29 minuter per träningspass*
- *Ca. 30-44 minuter per träningspass*
- *Ca. 45-59 minuter per träningspass*
- *Ca. 60-74 minuter per träningspass*
- *Ca. 75-89 minuter per träningspass*
- *Över 90 minuter per träningspass*

7. *Vilken typ av träning utövar du UNDER Coronapandemin?*

Flera svar är möjligt

- *Gång/promenad/power walk/ stavgång*
- *Löpning/jogging*
- *Styrketräning/gym*
- *Cykel/mountainbike*
- *Gruppträning (aerobics, gympa, step, zumba o.dyl.)*
- *Simning*
- *Lagidrott (Fotboll, innebandy, hockey, handboll o.dyl.)*
- *Racketsport (Tennis, paddel, badminton, pingis, o.dyl.)*
- *Annat*

8. *Ifall du svarade "Annat", fyll då i vilken typ av träning nedan.*

9. *Vilket påstående stämmer in på dig*

- *"Jag känner att det är ENKLARE att få till min träning idag än innan Coronapandemin"*
- *"Jag känner att det är SVÅRARE att få till min träning idag än innan Coronapandemin"*
- *"Jag känner ingen skillnad"*
- *"Det är både SVÅRARE och ENKLARE att få till min träning idag än innan Coronapandemin"*

10. *Jämfört med normala omständigheter. Vad/vilka hinder/möjligheter har pågående Coronapandemin lett till i din träning?*

Upplever du inga hinder eller möjligheter, skriver du det eller lämnar blankt svar.

11. *Vill du få studien skickad till dig efter godkänt arbete?*

Fyll i din mejladress i svarstexten nedan ifall du vill ta del av vår studie, i samband med att den blir godkänd. Tack för att du deltog och ta hand om dig själv och andra.

Appendix 7

Survey part 3, Qualitative content analysis

Meaning units (regular text)

Condensed meaning units (Underline)

Codes (Bold)

Theme/Category (Bold & Italic)

Survey response #71:

Negative: I **haven't felt comfortable being in a closed gym environment**. I haven't been at my place of work which is close to gyms.

Positive: I've been **closer to nature and parks** therefore **running** and trail running has been **easier to access**.

“Increased accessibility for running outdoors”