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Physical activity level and stress among the students in Satakunta
University of Applied Sciences - a quantitative study

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The purpose of this thesis was to compare the stress levels to physical activity levels with the students in Satakunta University of Applied Sciences. The studied period was autumn 2012. Other goals were to find out how the students experience their stress level, and what causes them stress. Also the physical activity level and the attitudes towards physical exercising were to be studied. An additional purpose was to find out if there is a need for further education and promotion of physical activity possibilities in Pori and would there be a need for physical activity groups for students organized by SAMK.

The research in this bachelor thesis was performed in a quantitative way. The questionnaire was formed by the researcher in an e-form (e-lomake) and it was sent to the participants through the school's e-mail system.

The questionnaire was sent to 2 groups on each campus in Pori, altogether to 149 students. The response rate was 25, 5% with 38 answers. It appeared that during the autumn term 2012 many of the participants experienced stress and the results showed that the stress levels were quite high (53% over the level of 7 in the scale from 1 to 10). The study showed that those who exercise the most and those who exercise the least experienced most stress during autumn term 2012. It was also clear that the participants experienced that they had not got enough information about the exercise possibilities in Pori in the beginning of their studies and there is a need for organized student exercise groups.

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1 INTRODUCTION

“You have always been taking care of yourself, you exercise, you have time to exercise and you know how to relax. Then you start to study, you have succeeded to get in the degree you wanted, then the study rhythm increases. You have also some part time job, you don’t have that much time to be social, and you don’t have time to exercise anymore. Then you wonder why you can’t sleep, eat, concentrate on your studies...” (Lätti 2008, 14) This is how one university student describes her story how she got extremely stressed during her studies in a university. This is not a unique story of one person; there are many other stories such as the earlier described one, and not only in study life. Nowadays stress is known to be a similar threat to health as obesity (Repo 2009).

As stress and prolonged stress among people continues to be one of the health risk topics of today, there is also a well-known way to fight it: physical exercise. (Repo 2009). Exercise works for every age group. For working aged people it can give balance to the pressures from work life and also something refreshing to do. For the society physically active working aged population means mentally and physically well doing and less sick working people. (Vuori 2011, 639).

The purpose of this thesis was to find information about stress and also about the benefits of physical activity. There are many ways to fight stress, but in this thesis the main emphasis was on physical activity as a source of releasing stress. I as a student have been experiencing stress while performing my studies and I felt that physical exercising helped me. Through these experiences the interest towards the physical activity attitudes, exercise amounts as well as the stress levels grew.

2 STRESS

Throughout life the human body has been experiencing stress and it is designed to react for it. Stress can have positive or negative effects on our lives. Positive type of stress, called eustress helps us to meet some challenges in our daily life. The negative type of stress is called distress (Derrickson & Tortora 2009, 675). Stress becomes negative when there is no relaxation between the stressful situations and the body gets no rest.

Sources of stress, “stressors”, come from a wide range of sources. They are not just objective, such as extreme heat or noise. According to an interactional perspective on psychological stress, it “arises from an imbalance between our perceived capabilities and perceived situational demands” (Taylor 2000, 10-11). The responses to different stressors vary between different people and sometimes the same person can experience the same stressor pleasant or unpleasant (Derrickson & Tortora 2009, 675).

The stress factors can be categorized in different ways according to different sources. Ahonen and Sandström (2011, 146) divide the stressors into four main groups:

- physiological stressors (pain, diseases, noise),
- psychological stressors (fear and anxiety to the memory of earlier negative experiences, feeling of not being in control of something),
- social stressors (getting into a marriage, breaking up with a spouse, public performance etc.) and
- stress affecting into cardio-vascular system and metabolism of the body (physical strain, extreme cold or heat, sudden loss of blood).

Some of these stressors, such as the social ones, can be experienced either on a negative or a positive way.

Another kind of categorizing stressors is to divide them into two main groups: life events and chronic stressors. Life events happen suddenly and are usually some kind of changes. Change is not always a bad thing, but the feeling of not being in control

triggers the negative feelings of stress. People face chronic stressors every day and they vary in a large range which makes them difficult to measure. Life event stressors and chronic stressors go hand in hand many times which can result in problems in mental well-being (Lätti 2008, 6).

2.1 Stress responses

The body reacts on stressors. The three stress responses are called the fight-or-flight response, the resistance reaction and exhaustion.

The fight-or flight response is activated by nerve impulses from the hypothalamus to the sympathetic part of the automatic nervous system (ANS). In this response the body is prepared for immediate physical activity. Large amounts of glucose and oxygen are brought to the organs such as the brain, heart and skeletal muscles, which are the ones to act in a sudden, even threatening situation. Body functions like digestive, urinary and reproductive activities are inhibited during fight-or-flight response because in that situation they are nonessential. There are also other changes in the body happening during this response. For example the reduction of blood flow to kidneys is promoting the release of a hormone called renin. The release of renin sets the renin-angiotensin-aldosterone pathway into motion, which is causing the release of a hormone called aldosterone. When aldosterone is released the kidneys are restraining Natrium, which eventually leads to elevated blood pressure. The fight-or-flight response is a short-term response to stress.

The other stage of stress responses is called the resistance reaction. This stage is helping the body to fight the stress after the effect from fight-or-flight response has dissipated. This stage lasts longer than the first one and it is initiated by the hormones released from the hypothalamus. These hormones involved in the process are called corticotropin-releasing hormone (CRH), growth hormone-releasing hormone (GHRH) and thyrotropin-releasing hormone (TRH). The released hormones are setting on processes that supply the body with glucose, fatty acids, amino acids to produce adenotriphospate (ATP) to repair damaged cells, and cortisol to reduce inflammation.

If the resistance reaction fails to combat the experienced stressor the body moves into the third stage of stress responses, the exhaustion stage. In this stage the body is experiencing prolonged exposure to high levels of cortisol and other hormones released in the resistance reaction. This causes wasting of muscles, suppression of immune system, and failure of the pancreatic beta cells and ulceration of the gastrointestinal tract. Also pathological changes might occur. (Derrickson & Tortora 2009, 676).

2.2 The effects of stress

Stress and burnout have become the headlines of literature and media. The negative effects of stress are discussed increasingly (Bengtsson 2004, 7). Stress can be experienced in many ways and the effects of stress are more or less personal. Stress is not something to be taken lightly, because long lasting stress can have even severe consequences. There are many symptoms and warning signs which indicate of experienced stress. They can be physical, which include pains and aches, nausea, dizziness, loss of sex drive and rapid heartbeat. Emotional symptoms would include moodiness, loss of temper, general unhappiness and inability to relax. Cognitive symptoms can include memory problems and problems in concentration. Behavioural symptoms of stress can include changes in eating habits, sleeping problems or nervous habits such as nail biting (Segal, J., Segal, M., Smith 2013).

2.2.1 Neurobiological effect of stress

Stress affects to our body also on neurobiological level. For example physiological stress activated by moderate physical exercising launches the physical stress reactions in the body. The physical stress factors, stressors, create hormonal changes in the body, which help the body to adjust and cope with the physical stress. When the brain's capacity to cope with physical stress improves, coping with other kinds of stressors such as psychological stress improves as well.

Endocrine system circulates hormones and regulates the activity and growth of target cells in our body. The endocrine system also regulates the metabolism in the body with the hormone secretion. Hormones are secreted through endocrine glands (pituitary, thyroid, parathyroid, adrenal and pineal glands) and through several organs and tissues that have hormone secreting cells but are not classified as endocrine glands, for example hypothalamus, pancreas, ovaries etc. The hormones travel in the blood circulation and through that act on their target cells (Derrickson & Tortora 2009, 642, 643).

When a human has chronic psychological stress the hypothalamus-pituitary-adrenal cortex axis (HPA-axis) in hypothalamus is working too much. When the HPA-axis is working too much it can be measured from the blood plasma that for example the level of a hormone called cortisol is too high. When there is a lot of cortisol in the blood the cortisol receptors in hypothalamus are combining it much more and therefore there is a high cortisol concentration in hypothalamus. Hypothalamus is normally decreasing the activity of the HPA-axis but with too much cortisol in it, its function is disturbed. This causes even more anxiety and stress to the person. Regular aerobic physical activity is decreasing the activity of the HPA-axis and the secretion of cortisol (Ahonen & Sandström 2011, 147).

2.3 Chronic stress

Chronic stress is a state of long lasting chronic psychological stress. The typical characteristics of it are also cynicism and decreased occupational self-esteem. Chronic stress is a common state in Finland. It can appear in people in any occupation. The incidence in Finland according to population survey performed in early 2000 25, 3% with mild burnout, and severe burnout 2, 5% of the whole population. Long lasting chronic stress is also called burn out.

The primary symptoms of chronic stress are mental and physical fatigue and stress, sleeping problems and disturbed function in the organ systems. It has been examined

that people with otherwise normal physical health but experiencing mild burnout have been measured to have developing problems in the body's endocrine system.

The body's stress hormones have been measured to be abnormally increased or decreased, especially the cortisol levels. Juva & Hublin (2011, 263) also describe in their book that according to a Finnish study people with severe chronic stress can often have other mental disorders such as depression, anxiety or problems with alcohol. Half of the people with severe burnout have musculoskeletal problems and one fourth have cardio-vascular problems.

The fatigue in this kind of state is both mental and physical and it does not go away after a day or a weekend. People with chronic stress have lost their joy and interest for their work and they question the importance of their work. They might also feel that they are not performing well enough and they are starting to lose some of the control they have on their work.

There is a little current information about the correlation between chronic stress and cognitive performance. According to initial studies people with chronic stress symptoms have problems with concentration and some memory problems. It is still unknown how problems with cognitive performance arise but the neurobiological model of chronic stress syndrome can be modified also to people with burnout. The stress hormones effect on a part in brain called amygdala, which is controlling the emotions, and also to another part of the brain called hippocampus, which is responsible for the memory and learning functions (Juva & Hublin 2011, 263).

2.4 Stress among students

Stress among third degree students have been studied a lot recently (Poutanen & Selinummi 2013, 14, May & Casazza 2012, 1). There is a lot of pressure on students as well as on everybody on today's society. According to the health survey performed by the Finnish Student Health Service (YTHS) the experienced stress among students has increased during the years 2000 – 2004. In 2000 22% of the participated men experienced heavy stress and 28% of the female participants. In 2004 the numbers were

25% of the men and 34% of the female (Lätti 2008, 5). The high stress prevalence among students is alarming, because the symptoms of stress include both physical and mental symptoms and disturbances. According to student survey a 53% of the Finnish third degree students have some kind of health problems that affect their study performance. In Finland this means over 100 000 students (Website of Tilaustokeskus 2011).

There are many stress indicators for college students, not just the pressures of academic performance. Other stressors are for example tuition and book expenses, living arrangement adjustments and time constraints. Also the social changes in a student's life are huge. For many, the student years in college or university are the ones when the transition from adolescence to adulthood takes place (Pedersen 2012). A person can move out from home for the first time, they start to develop their autonomy and identity independent from the family and start to take care of their housing and economy (Bigham et al. 2012). All these changes in life can be experienced stressful. Especially with today's economic situation the students are getting a lot of pressure and stress from that area with rising costs and also unstable future working markets (Diaz et al. 2011).

3 PHYSICAL ACTIVITY

3.1 The effects of physical activity on physiological wellbeing

Physical activity is a term for volitional muscle activity controlled by the nervous system. Physical activity increases body metabolism and creates physiological events in the body, such as increase of heart rate (Vuori 2005, 18 – 19). Physical activity and physically demanding tasks during work day and at home have decreased during years. Along with this change the meaning of physical exercising as the maintainer of good health and physical condition have increased and emphasized in the minds of people (Fogelholm 2007, 45).

Physical exercising affects primarily the organs and organ systems, which are affected by the physical strain. These are mainly bones, muscles, joints, tendons, lungs, heart and the blood circulation. Physical activity has also an effect on the organs that are responsible for the regulation of the metabolism, regulation of the hormonal and neural systems in the body and energy production (Alen & Rauramaa 2011, 31). Physical exercising maintains our body functions and it strengthens and improves physical qualities. Physical exercising has an effect also on motor skills. Regular physical activity increases the body's energy consumption, which has a positive effect on the function and health of organs (Alen & Rauramaa 2011, 30). The biological effect of physical exercising on the body is direct but it does not last forever if the exercising is not continued regularly. The effects of regular physical activity reflect also to the synapse level and genes. It can have also an effect on brain in the amount of capillary arteries and neural regeneration (Ahonen, Sandström 2011, 146).

3.1.1 Recommendation for health-enhancing physical activity

According to Finnish UKK-institute the recommendation for health-enhancing physical activity for adults aged 18 to 64 years is to improve or maintain aerobic fitness by being active several days a week, for total of at least 2h 30 min of moderate activity or 1h 15min of vigorous activity. In addition to these it is important to increase muscular strength and improve balance at least 2 times a week (UKK –institute physical activity pie 2009, Figure1). This remodeled recommendation puts more emphasis on the importance of muscular fitness to health. The revision is based on a broad review of scientific literature and research (website of UKK-institute 2010).

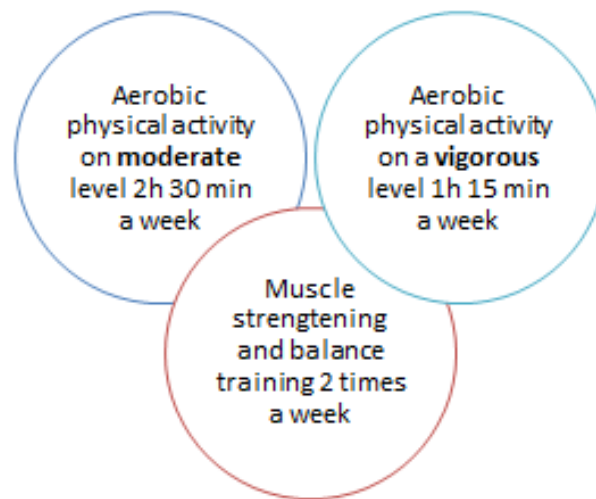


Figure 1. Weekly physical activity recommendation modified from UKK-institute physical activity pie.

Examples for aerobic physical activity done on a moderate level are: berry picking, fishing, hunting, heavy house & yard work, cycling, walking, Nordic walking, everyday physical activities, commuting to work and physically active games. Vigorous level activities could be for example Nordic walking, hill or stair climbing, fitness swimming, water running, aerobics, cycling, running, cross-country skiing, racket games and running ball games. Muscle strengthening and balance exercises include strength training, sequence training, balance training, ball games, skating, stretching, dancing and aerobics (UKK –institute physical activity pie 2009, appendix 3).

3.2 The effects of physical activity on psychological wellbeing

Psychological wellbeing is as vital to a human being as the physical wellbeing. It has been researched that those people who do physical activity often are more satisfied to their lives than those people who don't do physical activity. Especially aerobic exercising performed many times a week has been proved to be the most effective when

it comes to enhancing mental wellbeing and performance (Ahonen & Sandström 2011, 142). The pleasure and satisfaction that comes from physical exercising has been connected to beta-endorphins (hormones that for example decrease the feeling of pain). Nevertheless not everybody gets satisfaction from physical exercising due to various possibilities such as personality differences (Ahonen & Sandström 2011, 147).

Physical exercising has been used as a way of therapy when treating people with depression and chronic stress. For example in the control of daily stress physically active people manage better than physically passive people (Fogelholm 2007, 46). It has been studied that physical activity reorganizes the brain that the stress response is reduced and anxiety is less likely to interfere with normal brain function (Website of ScienceDaily, 2013). It has also been suggested that physically more active people feel themselves more energetic compared to the physically in-active ones. Secondly the hormonal changes and the changes in the body's metabolism caused by stress are smaller with physically active people. It can also be that exercising takes your thoughts away from the stressors (Fogelholm 2007, 46).

Regular physical activity (performed with regular patterns during the week, during many months) has been proved to have a positive effect also on the cognitive capacity. It has been studied with men and women over 55 years that regular physical exercising done on a moderate level including aerobic exercising, strength training and stretching had the biggest effect on the cognitive performance. The test group did physical exercising three times a week, 45 minutes at a time for six months (Ahonen & Sandström 2011, 143). This study showed that it is beneficial to exercise versatile the aerobic and strength capacities not forgetting the importance of stretching. During the recent years researchers have been paying more attention to the correlation between children's school performance and level of physical activity and the effect of physical activity has been seen to be improving the capacity to concentrate on the school tasks. Some studies have showed that regular physical activity has an effect on learning capacity and mood level (Ahonen & Sandström 2011, 146).

3.3 Researches about physical activity and stress

The correlation between physical activity and stress has been studied a lot in different studies with both humans and animals. These studies have shown for example that regular physical activity reorganizes the brain so that its response to stress is reduced. This was shown in a study done in Princeton University with two groups of mice. The other group got unlimited access to running wheel and the other group had no running wheel. After 6 weeks of time the mice were exposed to cold water (physical stressor) and their brains reacted differently from the start. The researchers studied on a gene and neuron level that the brain cells of the active mice did not leap into excitement state in response to the stressor (Website of ScienceDaily 2013).

Another study was made with U.S military men. In more detailed the study examined the association of physical activity with prospectively assessed post-traumatic stress disorder (PTSD) symptoms in a military cohort. The study showed that those military men who reported of lower physical activity levels were more likely to screen positive for PTSD. Men who exercised vigorously for at least 20 minutes twice on a weekly basis had significantly decreased odds for new onset symptoms of PTSD in a military cohort (LeardMann et al. 2011).

Another study was done with 47 young women with different physical activity levels. The researchers wanted to know how do these females react to psychological stressor and especially if there is a difference between those who exercise and those who don't. The women were categorized in three different groups: those who exercise rarely or not at all, those who exercise on a moderate level and those who exercise on a vigorous level. The participants underwent the Trier Social Stress Test for groups (TSST – G) where physiological and psychological stress responses were compared during and after stress induction. The study showed that those who exercise on a vigorous level had lowered reactivity when exposed to physiological stress. However the response to psychological stress went partly to different direction so that the more physically active ones reported a higher mood decrease. The researchers suggested that the findings for psychological stress response need to be further explored in experimental studies (Heinrichs et al. 2013).

4 RESEARCH METHODS

4.1 Quantitative approach

Quantitative research method is based on numbers and percentages. The results are organized by numbers and usually demonstrated with charts and tables. The information for quantitative studies is collected from different statistics or with structured questionnaires. The results are usually tried to generalize to a bigger population. The current situation of the studied phenomenon is usually a result of a quantitative research but the deeper connections about why things are the way they are remains unsolved. The quantitative approach allows more participants to the study when the answers are quicker to categorize and analyze (Heikkilä 1998, 16).

The questions of the questionnaire used in this study are closed-ended questions which mean that each question has choices for answering. The purpose of closed-ended questions is to simplify the handling and analyzing of the results. When the participant has many answer choices to choose from, it is called multiple choices. Quick answering time and the statistical analyzing of the results are the benefit of multiple choices. The disadvantages of multiple choices can be that the participants answer without considering all the choices first and that some of the questions may lack of some answer choice. In semi-structured questions some (usually just one) of the answer choices are so called open choices, which means that the participants has the opportunity add an own choice or to explain something with his/hers own words. This a good option if the researcher is unsure if all the answer choices are represented (Heikkilä 1998, 50-52).

4.2 Sampling

In this study probability sampling was used as a sampling method. Probability method is any method of sampling that utilizes some form of random selection (website of Web Center for Social Research Methods 2006). The advantage of probability sampling is that it ensures a reliable sample in a quantitative research. One of the disad-

vantages is that a sampling error is possible. As an example, the average age of the participants might not be the average age of the population (Rooney 2012). The random sampling method that was used was the stratified random sampling. This method increases the accuracy by ensuring that all groups are represented in the same sample in the same proportions as they are in the population (Burns 2000, 90). The population of this study was all the students in Satakunta University of Applied Sciences. There were 2 groups randomly drawn from each campus (stratum). The groups that started their studies in the spring term 2013 were excluded from the study because of their short time in this school. Another group excluded from the study was one group from a physiotherapy degree because they answered to the pilot questionnaire.

4.3 Collection of the data

The questionnaire was created with E-form in order to utilize the good format and make the collection of the data easier. The E-form collects and organizes the information from the questionnaires to Excel form. The Tixel program together with Excel is used to create graphs and charts from the results. The use of E-form makes it easy for the participants to use because they don't have to send the questionnaires back from their own e-mail address which would also not make the participants anonymous for the researcher.

The questionnaire (appendix 1 and 2) was planned and implemented by the researcher and a pilot test was performed for one group in a physiotherapy degree program. A pilot questionnaire is useful to perform because it can bring useful information about the structure of the questionnaire and the feedback about the questions can bring information about for example how understandable and useful they are (Heikkilä 1998, 22).

4.4 Hypothesis

Based on the theory about the studied connections between stress and physical activity the hypothesis was that physically in-active students have more stress than those who do physical exercising on a weekly basis 3 or more times a week. In the guideline of Finnish Käypähoito it says that the recommended physical activity in a week for 18 to 64 year olds is 2h 30min of moderate physical activity performed for example 5 x 30 minute sessions or 1h 15min of vigorous physical activity performed for example in a 3 time sets (website of Käypähoito 2013).

Another hypothesis was that the students in SAMK are not aware of all the possible exercise possibilities in Pori due to poor promotion and there would be a need for organized exercise groups for students.

5 PROCESS OF THESIS

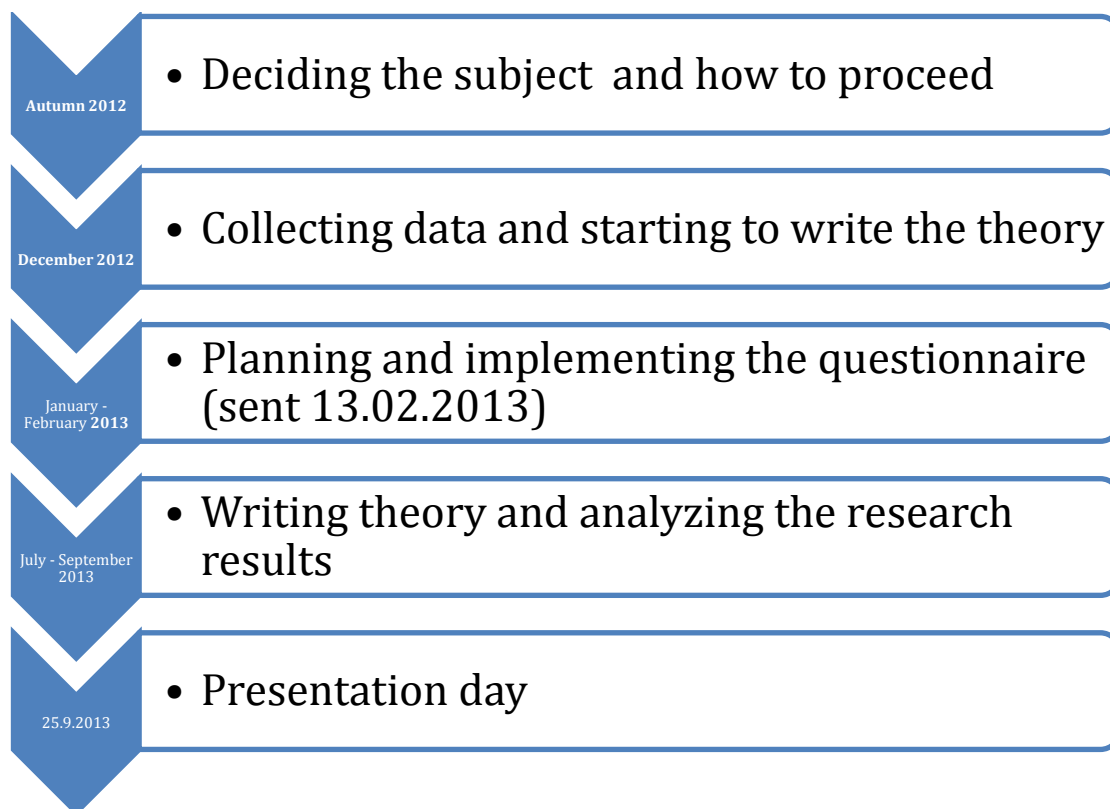


Figure 2. Process of thesis

6 RESULTS

After selecting 6 groups by a lottery there were altogether 149 participants in the survey. The questionnaire was sent through SAMK's e-mail on 13th of February 2013. After a week there were 39 replies. One reply had to be excluded from the study due to unclear answers in one part of the questionnaire. This makes a 25, 5% response rate.

6.1 Background information

A majority (66%) of the participants was female and 34% were male. A bit over half of the participants came from Tiedepuisto A campus (55%), which holds the IBS, Business Administration, Tourism, Information technology and Media and Communications –degrees (Website of Satakunta University of Applied Sciences). From Tiedepuisto B there were 26% of the participants and the rest 18% came from Tiilimäki campus.

6.2 Physical activity

Four of the participants exercised more than 4 times a week. In the second end of the scale there were 5 participants exercising one time a week or less than that. In the middle there were 16 (42%) participants exercising 3 to 4 times a week and 13 (34%) participants exercising from 1 to 2 times a week (chart 1).

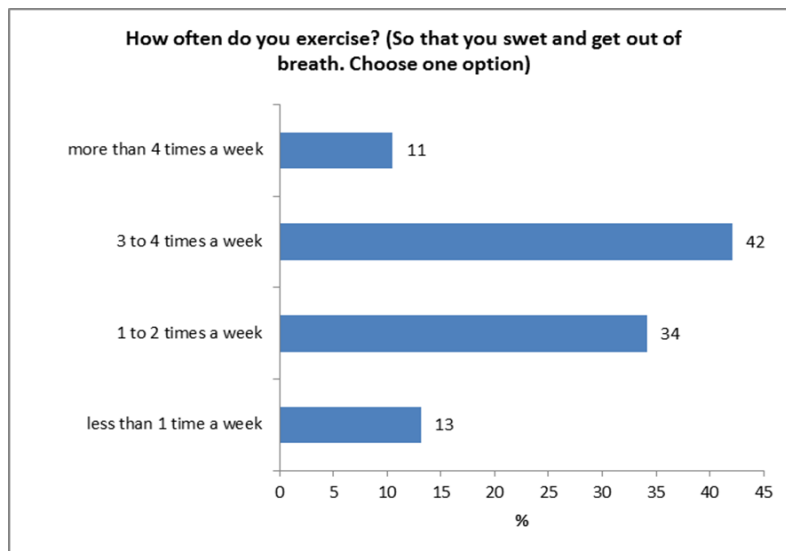


Chart 1. “How often do you exercise?”

Majority of those who exercise 1-2 times a week or less than that (55%) said that they don’t have time for exercising because of school work or other reason. A bit less than that (36%) explained that they don’t have money to exercise (chart 2).

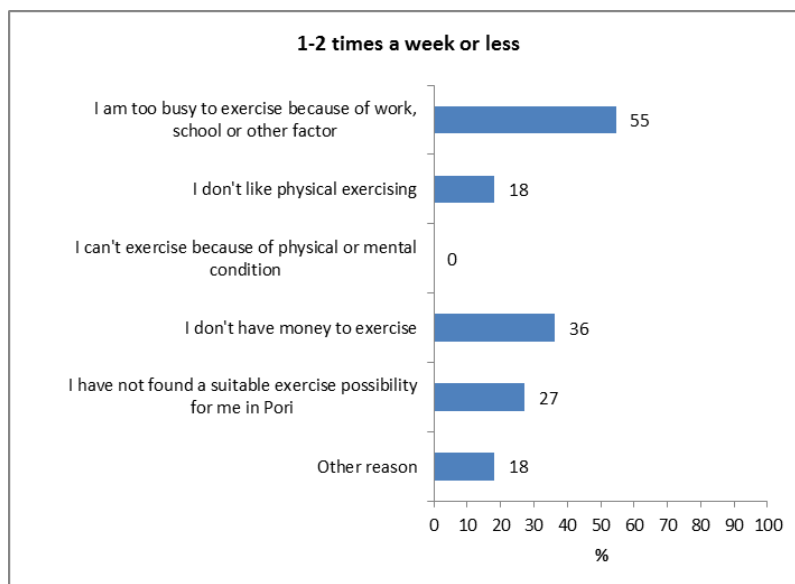


Chart 2. “If you exercise 1 to 2 times a week or less, what are your reasons for it? (You can choose max 2 options)” (N=11)

Other reasons were that they have not found any good exercise possibilities for them (27%) and 2 participants simply don't like exercising. The participants also describe their reason why to exercise 2 times a week or less to be laziness, lack of time and simply not being interested of exercising.

Two biggest reasons to exercise 2 to 3 times a week or more were the health benefits of physical exercising and the participants want to affect the way they look (chart 3).

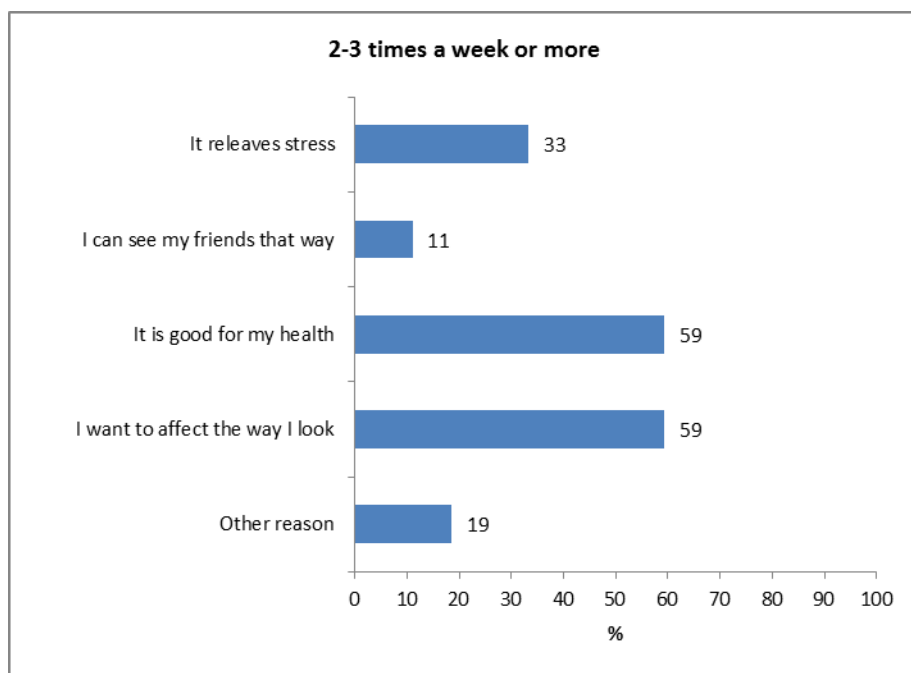


Chart 3. “If you exercise 2 to 3 times a week or more than that, what are your reasons for it? (You can choose max 2 options)” (N=27)

The third biggest reason was the stress –relieving affect. Some of the participants described their reasons also to be that exercising is fun and afterwards you feel better.

When beginning their studies in SAMK only 8 of the participants got enough information about the exercise possibilities in Pori. Almost half of the participants (47%) felt they could have gotten more information and the rest (32%) of the participants answered that they did not get enough information about the exercise possibilities.

Over half of all the participants (58%) would like there to be some exercise groups for students organized by for example SAMK. Only 6 (16%) participants don't want there to be any exercise groups organized for students and 10 participants (26%) might want there to be these kinds of groups.

6.3 Stress

Half of the participants experienced stress sometimes during the autumn 2012. A bit less than that (39%) experienced stress for many times and only 4 participants experienced no stress during autumn 2012.

Over half of the participants described their stress being on a high level during autumn semester 2012. At the scale from 1 to 10 this means stress on a level from 7 to 10. Only 7 participants described their stress being on a level of 3 or less (Chart 4).

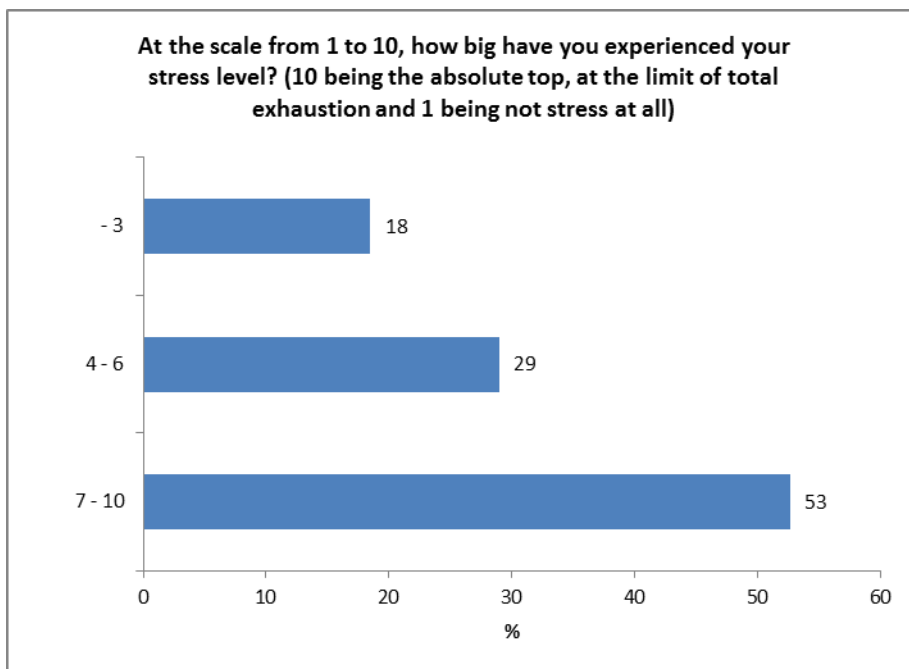


Chart 4. Experienced stress levels in autumn 2012. (N=38)

The biggest stressors for over half of the participants were school work and money issues. Work was the third biggest stressor and family life or friends are the least stressing factor.

The biggest symptom of stress was tiredness (53%). The other major symptoms for the participants were anxiety, sleeping problems and headache. The participants described their symptoms also as “thinking of unnecessary things which I can’t influence”, depression, and moodiness towards other people and gritting.

It appeared from the results that those who exercise the most and the least experienced the biggest levels of stress during autumn term 2012 (chart 5).

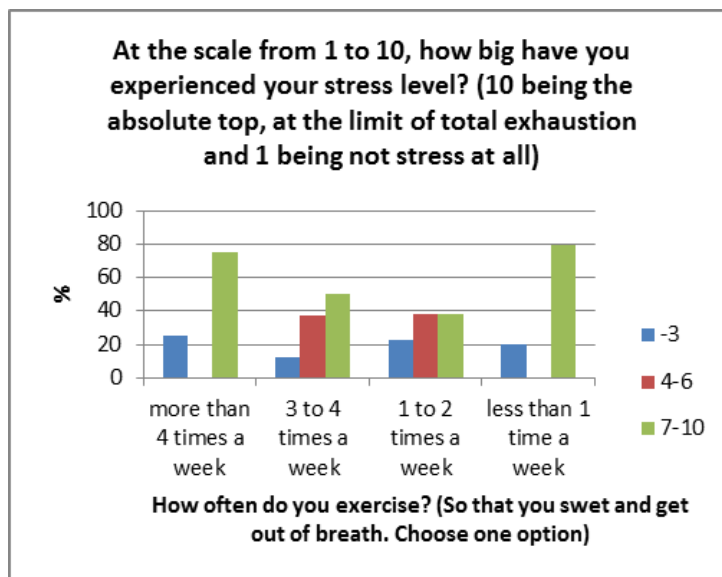


Chart 5. Stress levels at scale from 1 to 10 and physical activity level (N=38).

The ones who exercise from at least a once a week to maximum of four times a week experienced somewhat the same levels of stress without any significant differences. Nevertheless it seems that the ones who exercise 1 to 2 times a week experienced little less of stress at the highest level from 7 to 10.

7 CONCLUSIONS

7.1 Research results

The rather low response rate (25, 5%) was somewhat expected according to studies about online survey response rates. It has been studied that the response rates in online surveys all in all are lower than for example in paper-handed ones. One study compared the response rates of 8 different studies and it showed that the response rate in online surveys was 33% and in paper-based surveys the response rate was 56% (Nulty 2008, 302-303). In this study the answering period was one week. If the questionnaire would have been sent again for the study population it might have increased the response rate. However due the lack of time of the researcher this was not carried out.

It appeared from the results that those who exercise the most and the least experienced the biggest levels of stress during autumn term 2012. They experienced their stress on the level of 7 to 10 at the scale from 1 to 10. School work, money issues and work were the main stressors for these two groups. The hypothesis suggested that the ones who exercise less than 3 times a week were to experience more stress than those who exercised weekly that amount. It was not expected that the ones who exercise the most (4 times or more a week) would be experiencing a lot of stress. This study does not show the reasons for it so one can only guess at this point when any further investigations haven't been made about the subject. It might be so that when you exercise more than 4 times a week it makes your weekly schedule so busy and there is no time to rest between school and exercising. Exercising might also take time from your school work which creates more stress about school. It was also shown from the study that those who exercise 3 to 4 times a week or 1 to 2 times a week experienced stress and the difference between the stress levels was not significant. This finding also does not completely support the hypothesis about physically active students experiencing less stress than those who are physically less active. According to this study it seems that "golden mean" is the best way to go.

The amount of stress that the students were experiencing was quite high during autumn term 2012. Almost all of the participants experienced stress many times or sometimes (89%). The stress levels were also high, over half of the participants experiencing the highest levels of stress (7-10) in the scale of 1 to 10. School, work and money issues were the biggest stressors for the students also in this study as well as in many other studies around the world as mentioned before in the theory part.

Stress about school, work and money is understandable, and also something that can't be affected too much. What can be affected are the coping methods against stress. Poutanen and Selinummi piloted a stress managing course as a free elective course for medical students in Helsinki University in 2011. The meaning of this course was to give the students multiple tools to fight stress and also to try to affect to the stressors that are effectible. They also used peer support as a form of discussion groups for students. The feedback from this course was good and encouraging and the participants answered that they could utilize the methods later on in their studies (Poutanen & Selinummi 2013, 14-16). I believe there would be a need for these kinds of courses also in other universities and universities of applied sciences in Finland.

As I suggested in my hypothesis, there is a need for further information about the exercise possibilities in Pori. A majority (79%) of all the participants felt that they did not get enough information or they could have gotten more information about the exercise possibilities in Pori in the beginning of their studies. I would also belong to this percentage as I recall the beginning of my studies and the very limited information I got about the exercise possibilities. Some teachers give some tips about the possibilities they are aware of, but the information is not very organized.

A very positive finding is that a little bit over half (53%) of the participants exercise 3 times a week or more. Still 84% of all the participants answered they would want or they might want there to be these kinds of physical activity groups. As a student of SAMK I am aware that there is at least one gym on each campus so from that aspect the organizing of some kind of activities would not be impossible. Maybe with this kind of activity the rest of the ones who exercise one time a week or less would engage themselves to some group activity.

7.2 Reliability of the study

Validity and reliability are important concepts when it comes to evaluating the reliability of a research instrument as well as the reliability of the whole study. Validity describes the competence of the research instrument to measure the things it is supposed and designed to measure. As for reliability it describes the constancy and stability of the study. A reliable study is not sensitive for external factors and the instrument supposed to give somewhat the same result when repeated (Karjalainen 2010, 23).

Every time when having a questionnaire it is possible that some of the participants don't understand correctly the questions. A pilot questionnaire is good way to try to avoid unclear content of the questionnaire as the pilot participants evaluate the effectiveness and clearness of the content (Heikkilä 1998, 61). There was only one questionnaire disqualified from the study due to unclear answers which made it impossible to include it.

The questionnaire form was made in two languages. It was done in English and also in Finnish so that all the students would be able to answer the questionnaire. The English version of the questionnaire was sent to one group in the physiotherapy degree program as a pilot test and it was modified afterwards. The Finnish version of the questionnaire has the same content as the English one, but the Finnish version was not pilot tested, although it is highly recommended (Heikkilä 1998, 61). This results in few grammar mistakes and also an interpretation error in two questions. Due to poorly formatted questions the person who exercises twice a week has the option to choose from two different categories, which was not supposed to be possible. Nevertheless the attitudes towards physical activity are shown in this, but the exact percentages remain unclear. This in my opinion decreases the validity of this study in this particular part. Other parts are not affected by this error.

“Jos harrastat liikuntaa VÄHEMMÄN KUIN 1-2 KERTAA VIIKOSSA, mitkä ovat syynsi siihen? (voit valita maksimissaan 2 vaihtoehtoa)”

Translation: If you exercise less than 1-2 times a week, what are your reasons for it? (You can choose maximum of 2 choices).

”Jos harrastat liikuntaa 2 -3 KERTAA VIIKOSSA TAI ENEMMÄN mitkä ovat syysi siihen? (voit valita maksimissaan 2 vaihtoehtoa)”

Translation: If you exercise 2-3 times a week or more, what are your reasons for it? (You can choose maximum of 2 choices).

The anonymity of the participants was held in each stage of the study. The anonymity was promised and informed in the opening letter of the questionnaire. The questions were also made so that the participant can't be recognized by his/her answers. In order to maximize the amount of the participants there was two movie tickets promised to one of the participants through a lottery. Some of the participants voluntarily gave their e-mail address in order to take part to the lottery.

7.3 Suggestions for future bachelor theses

As the study showed, there is a need for improved education about the exercise possibilities in Pori. I think it would be extremely beneficial for the new students, who might come from totally different city, to get a proper information package about all the physical exercise possibilities in Pori with adequate information about the location, supply, prices and possible student discounts. This could also be nice marketing for the enterprises who offer physical activity services.

Another suggestion based on the research results, that someone would put on a start a student physical activity groups in SAMK. The supply is very poor compared to some Universities in Finland. There would be space to keep different kinds of activity groups and surely there would be many instructors available from the physiotherapy degree or from SAMK's service center Soteekki. If physically active working age population means mentally and physically well doing and less sick working aged people (Vuori 2011, 639), maybe physically active students mean mentally and physically well doing and less sick students?

The third suggestion is that it could be beneficial to study the stress levels of the students and the reasons of their stress more deeply. It is clear that the students of today are facing a lot of pressure from different directions and in order to fight against stress, it is essential to study the factors and connections behind it.

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What causes you stress? (you can choose max 2 options)

- Nothing causes me stress
- School work
- Family life or Friends
- Money issues
- Work

What kind of symptoms of stress have you experienced? (you can choose max two options)

- Headaches
- Anxiety
- Sleeping problems
- Tiredness
- Stomach problems
- have had no symptoms
- Other reason: (you can write to the text field below)

Other reason:

Please fill in your name and e-mail address if you want to take part to the lottery (2 tickets to Finnino)

Name

E-mail address

Tietojen lähetys

Tallenna

Thank you for your time!

Oppilaskysely liikunta-aktiivisuudesta ja stressitasosta

Lomake on ajastettu: julkisuus alkaa 13.2.2013 15.00 ja päättyy 19.2.2013 15.00

Tämä kysely on osa fysioterapian opinnäytetyötäni "Liikunnan vaikutukset Satakunnan Ammattikorkeakoulun opiskelijoiden stressitasoon".

Vastaja ei voi tunnistaa kyselystä.

Taustatiedot

Sukupuoli

- Mies
 Nainen

Opiskelukampus

- Tiilimäki
 Tiedepuisto A (Liiketalous)
 Tiedepuisto B (Tekniikka)

Liikunta aktiivisuus

Kuika usein harrastat liikuntaa? (Siten, että hengästyit ja hikoilet, vähintään 30 minuuttia kerrallaan. Valitse yksi vaihtoehto)

- yli 4 kertaa viikossa
 3 - 4 kertaa viikossa
 1 - 2 kertaa viikossa
 Vähemmän kuin kerran viikossa

Jos harrastat liikuntaa VÄHEMMÄN 1-2 KERTAA VIIKOSSA, mitkä ovat syysi siihen? (voit valita maksimissaan 2 vaihtoehtoa)

- Minulla ei ole siihen aikaa koulun, työn tai muun tekijän vuoksi
 En pidä liikunnasta
 En pysty harrastamaan liikuntaa fyysisen tai mentaalisen syyn vuoksi
 Minulla ei ole rahaa harrastaa liikuntaa
 En ole löytänyt minulle mielekästä liikuntavaihtoehtoa Porista
 Muu syy, mikä (voit kirjoittaa alapuolelle olevaan tekstikenttään)

muu syy:

Jos harrastat liikuntaa 2 -3 KERTAA VIIKOSSA TAI ENEMMÄN mitkä ovat syysi siihen? (voit valita maksimissaan 2 vaihtoehtoa)

- Se helpottaa stressiä
 Se on keino tavata ystäviäni
 Liikunta on hyväksi terveydelleni
 Haluan vaikuttaa ulkonäkööni
 Muu syy, mikä (voit kirjoittaa alapuolella olevaan tekstikenttään)

muu syy:

Aloittaessasi opiskelusi SAMK:ssa, saiko tarpeeksi tietoa Porin liikuntamahdollisuuksista?

- Kyllä
 Olsin voinut saada enemmänkin
 En saanut

Toivoisitko, että esimerkiksi SAMK tarjoaisi enemmän opiskelijoille suunnattuja liikuntaryhmiä?

- Kyllä
 Ehkä
 En

Stressitaso

Koitko edeltävän lukukauden aikana stressiä?

- Kyllä, usein
 Kyllä, joskus
 En kokenut

Asteikolla 1 - 10, millä tasolla koit stressin? (10 viittaa korkeimpaan mahdolliseen stressi tasoon, 1 viittaa ettei ole ollenkaan stressiä)

- 1 2 3 4 5 6 7 8 9 10

Mikä aiheuttaa sinulle stressiä? (valitse maksimissaan 2 vaihtoehtoa)

- Mikään ei aiheuta minulle stressiä
 Koulu ja siihen liittyvät asiat
 Perhe-elämä ja ystävät
 Raha
 Työ

Millaisia stressin oireita olet kokenut? (voit valita maksimissaan 2 vaihtoehtoa)

- Päänsärky
 Ahdistus
 Uniongelmat
 Väsymys
 Vatsaongelmat
 Minulla ei ole ollut oireita
 Muu oire, mikä (voit kirjoittaa alapuolella olevaan tekstikenttään)

Muu syy:

Jätä tähän yhteystietosi, mikäli haluat osallistua kahden Finnkinon elokuvaipun arvontaan. Arvonnän voittajalle ilmoitetaan henkilökohtaisesti sähköpostin kautta.

Nimi

Sähköposti

Tietojen lähetyks

Tallenna

Kiitos ajastasi!

