The behavioral and psychological context of exercise dependence

Ph.D. Thesis

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Introduction

The amount of physical activity in our daily lives has been reduced to an unhealthy minimum over the last decades due to the change of labour characteristics, e.g sedentary work. Several studies have shown that mental and physiological benefits of physical activity are almost undisputed. Scholars concluded previously several times that integrating physical activity in one's regular lifestyle is crucial in protecting health. The importance of body shape gets wider attention in European cultures. The consumer society has a crucial influence on people's values shaped by the media. People's attention to regular exercise is strongly linked to physical appearance and the pressure of being slim. The message of "solely thin, young and good looking people can be successful" may be addressed with sports, which can help in reaching this goal. The society needs to pay attention to adolescents, who are vulnerable to such a social pressure during the identity and personality formation of this life phase. Therefore, the changes of cultural ideals of the body images may have a stronger influence on youth than adults. The risk of developing unhealthy sporting habits may be higher among them.

Although regular exercise has shown to have beneficial effects on one's well-being, researchers found that exercise may lead to a form of dependence or abuse of that in some individuals.

In general, this category describes a condition in which the practice of a moderate or intense exercise becomes a compulsive behavior. Specifically, exercise dependence (ED) manifests as a strong desire to perform physical activity in one's leisure time, becoming uncontrollable and expressed in the forms of physiological symptoms (e.g., tolerance, abstinence) and/or psychological symptoms (e.g., anxiety, depression).

It also can have a negative influence to once social life, and/or to it's economic situation. Research into ED began about 40 years ago, yet not indicated in official diagnostic system, like DSM-V. Connecting to it's specifics, it can be categorized as a behavioral addiction. Seven major dimensions are needed to be observed during when identifying ED (Hausenblas et al., 2002):

- Withdrawal
- Continuance
- Tolerance
- Lack of Control
- Time
- Reduction of Other Activities
- Intention Effect

It is important to clarify if ED is the primary problem in the compulsive exercising, and it comes from the psychological and/or physiological needs, or it's occured by some other dysfunction, typically with an eating disorder. In that case excessive exercising is done for loosing weight or so on.

In Hungary there have been done a few researches to indetify the prevalence of ED. As far as we know only one study has ever been carried out using a national representative sample, where 0.3-0.5% of the sample were found to be in risk of ED (Paksi et al.,2009). Initially, researches were conducted in college and university students, where 1-3% met the criterion of ED (Szabo & Griffiths, 2007). Other studies examined between athletes, for instance triathletes. These found that more than 20-50% of them could have been at risk (Youngman, 2007; Blaydon & Lindner, 2002). Latter examination between recreational exercisers, like people using fitness and wellness facilities showed that ED varied to 6-30% (Costa & Oliva, 2012, Lejoyeux et al.), 2012).

As we mentioned ED has a strong relationship to eating disorders, and reserchers suppose that there are some gender characteristics, as the dominance of women. Despite of these assumption still there isn't any evidence in that question.

In the course of aging it can be seen that the amount of sporting is getting lower. This tendency can be seen also in the measure of ED. We hypothesize that it can be due to the commitments of adulthood, like family and work. On the other hand grown-ups have more complex coping mechanisms, and also a balanced self-esteem. Researchers have found that people exercising addictivly can be characterized as low self-esteem, perfectionism, and also with trait anxiety and high levels of sensation seeking (Szabó et al., 2010; Hausenblas & Giacobbi, 2004; Lichtenstein et al., 2013).

The explanatory models of ED highlight that exercise can be interpreted as a response to dealing with stress. As training helps in it effectively it can be an adequate coping mechanism, until it doesn't turnes into a compulsive behavior (Szabó, 2010). In time it outcrops during withdrawal effects when it's going to be hard to reduce it. It turns to be a vicious circle, where lower amount of exercising goes together with irritability, sleeping problems and also craving for leasue time activity.

As long we refer ED to a behavioral addiction it can be cured with similar methods used to other addictive problems, like motivational interwiew, cognitive-behavior therapy.

Objectives

Our main goal in this research was to investigate the phenomenon of *exercise dependence*. We found it an important thing to explore, since it is not a widely known field, although connected to our cultural norms. We were also focusing on the point what are the main risk factors behind to much exercising. Those knowledges can help us to workout a suitable prevention program that we are convinced has to start in early childhood as a primer prevention. Secondary prevention and rehabilitation is also necessary. As ED can be investigated in the line of body disturbances, which is a typical problem in our culture, we counted it to be important, if there can be seen stronger link to women experiencing ED. In eating disorder adults are most likely to being at risk. As far as ED has a strong realtionship to it, we wanted to study if there can found similar tendencies by the age. Our study is trying to make parallelism between ED as a behavioral addiction and recreational drug using, as far it is also a problem in young adults.

Hypothesis

Socio-demographic characteristics

H1: We surmise to find higher level of ED among women.

H2: We suppose that in younger group of age will be higher levels of ED, than in olders.

Exercise dependence

H3: Our assumption is to have the higher chance of ED among people exercising more (as the amount of sport by week, also by sporting hours) than others.

H4: We hypothesize that in the group of high risk for ED will be more person to being single. We also assume that the chance of ED among persons living in a relationship will be lower.

H5: We surmise that higher level of education can be a protective factor against ED.

H6: We used the amount of money spent for sporting habits as an indicator of resources. We hypothesize that the greater money one can spend for the exercising the greater risk the person can have.

Sporting habits

H7: We distinguished cardio (dinamic, long distance - at least half an hour or much more, like 24h by ultra runners) and static (like weight lifting) types of exercises. We surmise that in dinamic types of sports can be find higher levels of ED.

H8: We hypotesize that people sporting in structured space can be in lower risk of ED, than others sporting in an unstructured space.

H9: We think people sporting in groups will get higher levels of ED, than exercising alone.

Drug using

H10: We surmise in the group of high risk for ED persons will take more likely drugs, like cigarett, alcohol, and other illegal drugs.

Body satisfaction

H11: We hypotesize that a person with higher body dissatisfaction will get higher rates on ED. We have created an index for weight discrepancy. We assume the higher the level of discrepancy, the higher the level of ED will be.

Personality traits

H12: We surmise that younger people will have lower self-esteem. We also think that the lower measure of self-esteem means the higher level of ED.

H13: We assump that the lower amount of addictive exercising, the higher lewel of positive feeling of well-being can be found.

H14: We hypotesized that older people will get lowr rates on sensation seaking scale; also we think we will find a positive connection between sensation seeking and high levels of ED.

Methods

Our research was carried out with a quantitative method. The present study was conducted in 2010 among fitness center users. We chose our sample from 17 fitness and wellness centers in Budapest. The participation was voluntary, selection criteria were people under 18 years of age and exercising more than once in two weeks. Our participants yielded consent to take part to fill in our questionnaire with providing their contact details. In 24 hours they received an e-mail with a password to enter the online survey. It took approximately 20 minutes to complete

the survey. Our final sample consisted of 1743 people, 58.6% of them were female, the mean age was 31.7 (SD=8.491), the youngest person was 18, and the oldest one was 61 year old.

Our questionnaire consisted of different parts, namely, demographic questions, e.g. age, gender, residency, weight and height. In the second part we assessed the sporting habits, such as the frequency, the kind of sport they practise. We also measured the existence of eating disorders. As the final part of the survey, fitness users were asked to fill in two standardized questionnaires, the Exercise Addiction Inventory (EAI) (Terry et al., 2004) and the Exercise Dependence Scale-21 (EDS) (Hausenblas & Symons Downs, 2002). Additonal to these scales self-esteem, well-being and sensation seeking were also measured. Furthermore we measured body dissatisfaction with the Eating Disorder Inventory (Garner et. al., 1983), and the SCOFF scale (Morgan et al., 1999)

Results

At the focus of our research was exercise dependence. After excluding people suffering eating disorders our final sample included 1439 people.

Two tests focusing on ED – EDS and EAI – were analysed. Based on the scale scores three groups were separated: dependent, symptomatic and non-dependent /asymptomatic. On EAI the results showed 7.9% of the people showed exercise dependence (dependent group), 76.9% scored into the symptomatic range and 15.2% into the asymptomatic group.

On the other hand, EDS scale showed similar rates, 2.2 % of the sample belonged to the dependent group, 69.3% to the symptomatic and 28.5% to the non- dependent group. Concerning the prevalence of ED – symptomatic group we think it is crucial to focus on this group, and to intervene, prevent and support them. These people show some symptoms of exercise dependence – but are not dependent yet - however they also have a higher chance to get into the dependent category, to become addicted.

According to our results there can't be seen any differences by gender (EAI: $u=251091.5$, $p=0.627$; EDS: $u=253079.0$, $p=0.905$) (H1). Regarding to the literature inconsistent outcome on gender differences varying on ED could be found. Usually it depends on the scale of measuring ED, that's why it can be an artefact of the instrument design.

In the next step of the analysis the relationship between age and exercise dependence were explored. We can state, younger people – aged under 30 - are in higher risk for ED ($r_{S,\ EAI}=-0.064$, $p=0.016$; $r_{S,\ EDS}=-0.177$, $p\leq0.001$) (H2). It may be connected with younger life state, having less duties, e.g. cost of living, work-life balance. The identity of young people is on the

way of progress, so sport can be a good way to define themselves. Also they are more vulnerable for the message of consumer society's pressure to being thin and good-looking. In that connection sport can help in reaching this goal.

The level of education seemed to be a protective factor in our research. 65% of the sample has a university or college degree. In terms of education the higher level of studies, the lower scores people got on ED ($r_{S,\ EAI}$=-0.094, p≤0.001; $r_{S,\ EDS}$=-0.148, p≤0.001) (H5). Addictive exercising may linked to having worse coping mechanisms, poorer ways to deal with stress. One way to improve in it is to studying in higher education. As having more problems to deal with during education the skills are improving also. These skills may help to deal with other problems in one's life.

We also measured the financial status of our sample, as far the amounts of money spent on exercising could be really high. According to it the exercise addict person is more likely to spend lots of money to his/her passion, than his/her economics could let for him/her. Our results showed that our hypothesis was right (EAI: r_s =0.158, p≤0.001; EDS: r_s =0.170, p≤0.000) (H6). People spending 5,000-30,000 HUF to sporting habits have the higher chance to be in risk for ED.

Looking at the amount of sport activity, we can state the growing number of weekly exercising and also the sporting hours are in parallel with the growing risk of ED (weekly exercise frequency: EAI: r_s =0.213, p≤0.001; EDS: r_s =-0.269, p= p≤0.001; sporting hours: EAI: r_s =0.177, p≤0.001; EDS: r_s =0.292, p≤0.001) (H3). Frequency of sporting – more than two times a week – resulted in to act as significant predictor in higher risk for ED. Addictive level of exercise can occure both pyhisical (e.g. fatigue fracture, inflammation) also psychological problems (irritability, sleeping disturbances, deconcentration) in one's life. Not only health problems, but also family and friedship disturbances can be demaged by ED, and also existential (school or work) problems can happen.

More than the half of our sample lives in a relationship (62.5%), and 35% is single. Living in a relationship seemed to have a protective impact opposite to ED (u_{EDS}=219379.0, p=0.011) (H4). We state it supports the health psychology's findings toward to relationships' protective effects against to any kind of life problems.

Not just the realtionship, but also exercising in a group can be a protective factor. 62.4% of the sample stated, they are sporting rather together with others, and 37.5% prefer to exercise alone. As the results showed those people doing sports alone are in greater risk to having high level on ED (EAI: u=236046.5, p=0.034; EDS-HU: u=223508.5, p≤0.001) (H9). We surmise in that case

there isn't any social protection, there isn't any person who would draw their attention, that they are going on a bad path.

As far as ED has a strong relationship to body satisfaction, weight perception, we thought it could be important to measure also these indicators as well. The average body mass index (BMI) of our sample was 23.6 (SD: 3.63), means normal weight. Our discrepancy index showed the satisfaction with the weight of the sample. It turned out, they wanted to lose (or gain) 4.9 kg. Statistical analyses showed that there can't be found any relation between the discrepancy index and ED (EAI: r=-0.027, p=0.315; EDS: r=-0.003, p=0.919), it means ED is a separate phenomenon, beside eating disorders (H11). Satisfaction to bodyshape is connected to weight goals. We can verify, the higher level on ED the higher the level of body dissatisfaction will be (EDS: r=0.092, p=0.001) (H12). It seems that through sporting people can grow their body-conscious. Getting a feedback about exercising, to being in a dinamic shape, when they don't have to worry, it is considered as a healthy lifestyle, until the level of sporting doesn't reaches a compulsive level.

We hypotesized that drug users will be found more likely in the group of addictive exercisers. Our analyses showed to be truth in the case of using/or trying amphetamines, cocaine, steroides, taking alcohol and medical drugs together and also in taking sedantary and barbiturate pills (H10). To much exercising can be described as an impulsive behavior as well as drug consumption. We surmise this is a greater risk for younger age group, as they got weaker coping mechanisms. In that case higher levels of sporting can be a dangerous alternative for coping harms, just like drugs turnes to be as one.

The level of self-esteem increased in this research parallel to the judgement of well-being (r=0.407, p=0.000). Also it has a connection to body satisfaction (r=0.306, p=0.000). If percepted well-being decreased the amount of body satisfaction lowered as well (r=0.200, p=0.000). We took age as an important factor in the risk of ED, that's why we also measured it in the connection of personality traits. We can state that people aged under 30 have significantly lower self-esteem than older people (u=229221.0, p=0.002). Also statistically significant relation could be detected between higher level of ED and lower self-esteem (H12). We conceive that to much exercising may be in relation with wobbliness in personality, which can be the base of negative perception of oneself.

Sensation seeking wasn't investigated before according to ED. It can be devided into 4 traits: adventure-seeking, experience-seeking, disinhibition and boredom. The attitude of sensation seeking is a typical feature of youngsters, as it was proved to be in our research. In all traits mentioned before younger people had higher levels than elderly ones (t_e=4.514;

p=0.000;t_a=9.915; p=0.000; t_b=7.087; p=0.000; t_i=2.717; p=0.007) (H14).Our hypothesis were verificated, higher levels on sensation seeking means greater risk for ED. We found significant impact for ED with the trait of adventure-seeking and experience-seeking.

Conclusions

The amount of physical activity in our daily lives has been reduced to an unhealthy minimum over the last decades. Several studies have shown that the mental and physiological benefits of physical activity are almost undisputed. Public attention to regular exercise is strongly linked to physical looks. The importance of body shape gets wider attention in our culture. The consumer society has a crucial influence on people's values shaped by the media that everybody must be slim. The changes of cultural ideals of the body image may have stronger influence on youngsters. The risk of developing unhealthy sporting habits may be higher among them.

Although regular exercise has been shown to have beneficial effects on one's well-being, researchers have found that exercise may lead to a form of dependence or abuse in some individuals. Exercise dependence (ED) manifests as a strong desire to perform physical activity in one's free time, which becomes uncontrollable and it is expressed in the form of physiological symptoms (e.g., tolerance, abstinence) and/or psychological symptoms (e.g., anxiety, depression).

Based on the previous studies, the objective of the present paper is to investigate the phenomenon of ED and to explore the volume and frequency of exercise dependence in a Hungarian sample of subjects using fitness and wellness facilities regularly.

Our questionnaire consisted of different parts, namely, demographic questions, like age, gender, residency, weight and height. In the second part we assessed the sporting habits of the subjects, such as frequency, the kind of sport they practise. We were using validated measurement instruments of exercise dependence (EDS-HU) and Exercise Addiction Inventory (EAI). We were interested in other components of personality, as body dissatisfaction (Eating Disorder Inventory), self-esteem (Rosenberg scale), personal well-being (WHO Well Being Inventory) and sensation seeking (Brief Sensation Seeking Scale).

The survey was conducted in Budapest, with the participation of 17 fitness centers. Our final sample consisted of 1743 subjects (58.6% were female) mean age = 31.7 (SD = 8.49). In our analysis we only counted people without an existing eating disorder (measured with SCOFF test), since it is an important term of ED. In that way our final sample included 1439 people.

On the EAI scale the results showed that 7,9 % of the sample belonged to dependent group, 76,9% to the symptomatic. On the other hand, on EDS scale we found similar rates, 2,2% of the people showed exercise dependence, 69,3% scored in the symptomatic range. It means that the incidence of ED is higher among regular fitness facility goers than in normal population. Gender differences were not found in the sample although we were hypotesized the dominance of women. We found that young people (aged under 30) are at greater risk. It might be because they also have poorer abilities in stress management and coping mechanism. Their self-esteem is also lower, but they scored higher points on sensation seeking.

In terms of the relationship between obligatory forms of exercise dependence and the frequency of sporting habit we have found that the more the person exercises the higher the prevalence of the dependence becomes.

Due to their activities, these groups of people are at elevated risk for ED, thus it is highly important to raise their awareness of this phenomenon of ED, its negative impact on physical and mental health. EDS and EAI tools can contribute to the early detection of ED and support the prevention and intervention processes. In sport and leisure facilities, these tools are useful for screening, but many addicted exercisers perform their activity in informal settings, e.g. simply going out for a run on their own. Assuming that “only” about two to seven percent of the exercising population may be affected by exercise addiction and that the majority of exercises addicts are “lone wolfs”, the use of the questionnaires may have further limited value in assessment. Introducing these screening tools to the GPs could also contribute to reveal this hidden disease.

List of Publications

Publications related to this thesis

Book chapter

Menczel Zs. A megedzett étvágy. In: Gyömbér N., Kovács K., Imre Tóvári Zs., Lénárt Á.,Hevesi K., Menczel Zs. Fejben dől el. Sportpszichológia mindenkinek. Noran Libro, Budapest, 2012: 240-250.

Peer-reviewed publications

1. Menczel Zs., Griffith M. D., Vingender I., Eisinger A., Farkas J., Magi A., Mervó B., Kökönyei Gy., Demetrovics Zs.. (2016) Exercise dependence in amateur competitor and non-competitor recreational exercisers. Int J of Mental Health & Addiction, pp. 1-8 (in press).
2. Menczel Zs, Kovács E., Eisinger A., Magi A., Vingender I., Demetrovics Zs. (2014). Exercise dependence among Hungarian fitness center users: preliminary results. New Medicine. 18(3): 103-108.
3. Menczel Zs., Kovács E., Vingender I. (2011) A testedzésfüggőség: egy újabb viselkedéses addikció a modern evés- és testképzavarok sorában. Addiktológia Hungarica.10(4): 301-317.
4. Liptai-Menczel Zs. (2010). A fitness-jelenség. Új ifjúsági szemle. 8.(3): 85-93.

Other publications of the candidate

1. Petke Zs., Csorba J., Mészáros J., Vingender I., Farkas J., Demetrovics Zs., Kovács Zs., Menczel Zs., Pataki Z., Simor P., Havasi A., Melles K., Márványkövi F., Rácz J. (2012). Bupenorphine/naloxone szubsztitúció alatt álló ópiátfüggők pszicoszociális tüneteinek változásai hathónapos terápia során. Neuropsychopharmacologia Hungarica. 14.(1): 7-17.
2. Petke Zs., Mészáros J., Vingender I., Demetrovics Zs., Farkas J., Kovács Zs., Menczel Zs., Havas A., Simor P., Rácz J. (2011). Early dropout after one month of Buprenorphine/Naloxon maintenance therapy. New Medicine. 15(2): 72-75.
3. Petke Zs., Csorba J., Mészáros J., Vingender I., Farkas J., Demetrovics Zs., Balázs H., Hoffman K., Kovács Zs., Menczel Zs., Pataki Z., Simor P., Havasi A., Melles K., Márványkövi F., Rácz J. (2011). Kezelésben maradásra ható tényezők vizsgálata metadon- és buprenorphine/naloxone terápiában részesülő opiátfüggőknél. Addiktologia Hungarica. 10(1): 5-31.

4. Bollók S., Menczel Zs., Vingender I. (2010). Representations of the Social Body and Drog Use. New Medicine. 14(2): 54-62.
5. Kozma N., Menczel Zs., Pados Z., Tóth E. (2007). Ifjúságsegítő civilszervezetek iskolai beágyazódásának vizsgálata. Új ifjúsági szemle. 5(2): 83-94.