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EXERCISE, ANABOLIC STEROID DEPENDENCE, MUSCLE DYSMORPHIA, PERFORMANCE ENHANCEMENT DRUG ABUSE

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ABSTRACT

Visuality, which has come to the fore in recent years and the habits it brings, also reveal both physical and psychological syndromes. Behaviours such as training addiction, anabolic androgenic steroid use, and performance-enhancing drug use cause muscle dysmorphia syndrome. In this comprehensive evaluation, both the training addiction caused by muscle dysmorphia and the psychological effects of steroids and performance-enhancing drugs used to become more muscular were compiled. Muscle dysmorphia and its accompanying syndromes, which have not yet been classified into the disorder category by the American Psychiatric Association, are quite common. Pharmacological treatment and cognitive behavioural therapy come to the fore for body perception disorder, which is the closest disorder to this syndrome. More evidence-based controlled randomized studies are needed to evaluate muscle dysmorphia and similar syndromes in the disease category.

Keywords: Exercise addiction, Anabolic androgenic dependence, Performance enhancement drugs abuse, Muscle dysmorphia, Body dysmorphic disorder

ANTRENMAN, ANABOLİK STEROİD BAĞIMLILIĞI, PERFORMANS ARTTIRICI İLAÇ KULLANIMI, KAS DİSMORFİSİ

ÖZ

Son yıllarda oldukça ön plana çıkan görsellik ve beraberinde getirdiği alışkanlıklar bazı fiziksel rahatsızlıkları ve psikolojik sendromları da ortaya çıkarmaktadır. Antrenman bağımlılığı, anabolik androjenik steroid kullanımı, performans arttırıcı ilaç kullanımı gibi davranışlar kas dismorfisi sendromunu meydana getirmektedir. Bu kapsamlı derlemede gerek kas dismorfisinin getirdiği antrenman bağımlılığı, gerekse daha kaslı olmak için kullanılan steroid ve performans arttırıcı ilaçların psikolojik etkileri değerlendirilmiştir. Henüz Amerika Psikiyatri Derneği tarafından hastalık kategorisinde sınıflandırılmamış kas dismorfisi ve beraberindeki sendromlar oldukça yaygın görülmektedir. Bu sendroma en yakın olan beden algı bozukluğu rahatsızlığı için farmakolojik tedavi ve bilişsel davranışçı terapi ön plana çıkmaktadır. Kas dismorfisi ve benzeri sendromların hastalık kategorisinde değerlendirilmesi için daha fazla kanıta dayalı kontrollü randomize araştırmalara ihtiyaç duyulmaktadır.

Anahtar Kelimeler: Antrenman bağımlılığı, anabolik andrejonik steroid bağımlılığı, performans arttırıcı ilaç bağımlılığı, kas dismorfisi, beden algı bozukluğu, vücut geliştirme

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INTRODUCTION

1. Literature Review

1.1. Exercise Addiction

It has been proved that regular exercise improves both physical and psychological health (WHO, 2016). However, being keen on excessive unstoppable exercise may call forth side effects, improving sensitivity to physical exercise damage or sociable and professional dysfunction. Emesis, nausea, apopsychia, chest distress, hypoglycaemia, chest pain, and sudden death are some of the examples of the acute exercise injuries caused by overtraining (Shepherd, 2001). Musculoskeletal pain and injury and malfunction of the persons immune system are also other possible consequences of overexercise. This phenomenon has been called as Exercise addiction (EA). EA has been conceptualized as not being able to control one's exercise behaviour that becomes a further compulsive behaviour in which the symptoms are managed to manifest (Berczik, Szabo & Griffiths, 2021; Szabo, 2010). Due to the lack of peer reviewed evidence, EA has not been listed under the mental disorders in the Diagnosis and Statistical Manual of Mental Disorders (DSM) even though it has been suggested to be classified under the behavioural addiction during the council discussions of the DSM-5 board (APA, 2013). Exercise dependence (Adams, 2009), compulsive exercise (Murray, Maguire, Russel & Touyz, 2012), exercise abuse (Calogero & Pedrotty, 2004), obligatory exercise (Thome & Espelage, 2007) used as other terms for explaining the EA ever since. This review aimed to discuss the theoretical models of EA and other related syndromes with its relations to diagnostic criteria. It also debates the comorbidity with the other kind of disorders with its fundamental motivators for differentiate the repeated ongoing recreational exercise and competing sports from EA (Chen, 2016).

1.2. EA's Diagnosis

Beakeland has first mentioned the idea of EA while investigating the deficiency of sleep quality due to exercises in 1970 (Beakeland, 1970). Enrolled individuals were getting paid for the attendance of the research, but they were willing to be continued on exercising even though they were not going to get any extra payment for it. Ever since this situation has got much more attention and called exercise addiction. Variety of research models has been used on this subject. Behavioural addictions' theoretical model contains following symptoms: (i) *prioritization,* training is the most important thing in life, (ii) *modification of mood,* training is the main coping strategy for dealing with unexpected events and emotional regulation, (iii) *forbearance*, to stop yearning, person rises the amount of exercise, (iv) *discontinuation*, creates anxiety, depression, anhedonia, irritability when the person discontinues the exercise and also it develops issue on coping with professional and social duties, (v) *recurrence*, person is to return to the earlier pattern of training (Brown, 1997; Brown, 1991; Aidman & Woolard, 2003; Allegre, Souville, Therme & Griffiths, 2006). In DSM-IV-TR, Downs and Hausenblas determine the EA under the substance abuse criteria that aligned with the behavioural addiction norms (Hausenblas & Downs, 2002; Downs & Hausenblas, 2009). With the knowledge of the physical, social, and psychological issues, individuals with EA continue of the overtraining and ongoing exercise in which with the key elements (i) no control, (ii) discontinuation, (iii) lessen other activities, (iv) forbearance, many hours of overtraining, (v) prolongation (APA, DSM-4, 2000). Previous research has proved that EA has got varying influences as risk factors. The findings show that it is relatively sparse in the general population with a percentage from 0.3-0.5% to 3% (Monok, Berczik & Urban, 2012; Sussman, Lisha & Griffiths, 2011). The numbers are altering among the professionals and the regular exercisers. The influences of high risk for EA were 0.9-3.2 according to findings of Monok et al (Monok, Berczik & Urban, 2012). With the number of 6.9%, it was much higher among students at the sports college, 3.6% is a usual exercisers rate for being at the risk for EA according to estimation of Szabo and Griffiths (Szabo & Griffiths,2007). Moreover, few other research suggests that the average range is much higher as 22-50% within the exercisers' risks to become EA (Lojeyeux, Avril, Richoux, Embouzza & Nivoli, 2008; Anderson, Basson, Geils, &Farman, 1997).

1.3. Anabolic Androgenic Steroid Dependence

Androgenic anabolic steroid (AAS) use's prevalence rate among young men is unexpectedly as high as 6% (Sagoe, Molde, Andreassen, Torsheim & Pallesen, 2015). High genetic quality, masculinity and health are the markers of general perceived physical strength (Sell, Lukazsweski & Townsley, 2017) in which develop an incentive use of AAS. Moreover, dysmorphic body image has been found to be associated with the pre-phase of starting the ASS within abusers (Smith, Bujs, Hon, Heijer & Ronde, 2021). It has been well established that infertility, hypogonadism, acne, and gynecomastia are somatic adverse impacts of using AAS (Horwitz, Andersen & Dalhoff, 2019). In addition, it has been reported that some psychiatric effects of using AAS are depression, aggressiveness, and mania (Pope, Wood, Rogol, Nyberg, & Bhasin, 2014). Nakeeran and colleagues (2022) has concluded a study to show that consuming high level of long-term testosterone use is highly associated with major depression and suicidal attempts. Hypothalamic-pituitary-gonadal axis is affected by ASS and therefor injecting the exogen (ASS) lower the endogenous manufacturing of testosterone, follicle stimulating hormone and luteinizing hormone (Rahnema, Lipshultz, Crosnoe, Kovac & Kim, 2014). Within last 10 years of studies have shown other associations between mental health and testosterone; firstly, hypogonadal men's psychology improve drastically after inducing testosterone replacement therapy and secondly, prostate cancer men's deprivation of androgen therapy is linked with depression (Hartengs & Kuiper, 2004; Nead, 2019; Walter, 2019; Fisher et al., 2019; McHenry et al., 2014). And the third is, ASS abusing cause after effect on former users in which their testosterone plasma is low, and they face higher level of depressions symptoms, these findings have been conducted by Rasmussen and colleagues (2016). Few studies have been explored that ASS may cause to induce the alteration of the nervous system therefor its functionality. The other new studies have shown that amygdala grows, and less visual spatial functions have been associated with the weightlifters who has long term use of ASS, when compared with the weightlifters with no ASS history (Kaufman et al., 2015). Moreover, thinner cortex in various regions and less total grey matter, cerebral cortex and putamen are also linked to the long-term usage of ASS (Bjørnebekk et al., 2017). With all this knowledge, we can conclude that ASS abusing causing variety of mental health problems and new studies are on the way to shed light on the neuro-physiatric consequences as well (Windfeld-Mathiasen et al., 2022).

1.4. Performance Enhancement Drugs Abuse

Both professional athletes and none-professional pastime athletes are keen on using variety of supplement and performance enhancement drugs (PED) to look astonishing in a society where people strive for perfection and a great look is all important aspect of being a valuable part of that society (Mooney et al., 2016). This phenomenon once was for professional athletes now pervade for all kinds of sports persons in all ages, and thus develops a public mental and physical health problems (Mazzoni, Barroso & Rabin, 2017). The nutritional supplements that have been used by the professional athletes are well governed and researched, but the rest of the other supplements and PED's in which used by the public has been lack of governmental check and evidence-based research (GAO, 2002; Reuter & Pardo, 2016; Corazza & Urrestarazu, 2017). Suplementing prevelance among those persons related to sports activities has been increasing over time (Morrison, Gizis & Shorter, 2004). There is an estimation that %85 of athletes and other sports pro or no pros are supplementing in their daily exercise and training routines (Maughan, Depiesse & Geyer, 2009). The benefits and the risks factors of supplementing has been known for some time like proteins, creatine, and pharmacological steroids. But we do not know much about the other untested underground lab manufactured PEDs in which it brings a great deal of concern for the public, and this growing consumption of by body builders, sport related non pros and gym rats are expending in all age groups including adolescents (Verroken, 2000; Müller, 2010; Molinero & Marquez, 2009; 2014; Kamber & Mullis; Corraza et al., 2013). The term performance enhancing drugs is an alliance of variety of different drugs from anabolic steroids to sex enhancing performance drugs, to growth hormones, peptides, and all other related drugs for variety of goals including gaining mass, loosing fat and weight loss (Bates & McVeigh, 2016). Though these products have been available for athletes

and body builders for many years (World Anti-Doping Agency, 2016; Evans-Brown, McVeigh, Perkins & Bellis, 2012; Bates & McVeigh, 2016), with the advancement of internet and easy accessibility to these products by the general populations causing a sly and dangerous health and mental issues within the society (Coomber et al., 2014). PEDs have been marketed in a tricky misleading way like ''healthier'', ''natural'', ''safer'' as they are good alternatives to medicines and as if they are new age psychoactive substances (Corazzaet al., 2013). PEDs have been used by public without consulting neither to a medical doctor nor to a practitioner or physician, thus the users do not even know the possible consequences and or they are not aware that the drugs that are not even tested pharmaceutically. The estimation of these PEDs that are 26% to 42% out of all drugs may be fake (Thevis et al., 2008; Graham et al., 2009).

1.5. Muscle Dysmorphia

Muscle dysmorphia has been originally called a disorder as classifying criteria under the eating disorder as reverse anorexia. Since then, it has been continuously classified under varies other disorders in which no consensus has been clarified yet (Walsh, 2007). There have been numerous majority studies published on the muscle dysmorphia in women whose evaluate themselves big, fatty, or unacceptably dysmorphic (Cash & Pruzinsky, 2002). Though, few study has been concluded (Garfinkel, Kennedy & Kaplan, 1995) on this for men and it is a continuously exploring field (Olivardia, Pope & Hudson, 2000). As men has become more interested in muscle mass, want to look big and muscular (Pope et al., 1997; Pope, Phillips & Olivardia, 2000) and consequently has more muscle dysmorphia phenomena, even some research claims that the range is from early adolescents to all the way to late adults with age range from 10 to 60 (Jacobi & Cash, 1994; Ricciardelli, McCabe & Banfield, 2000). Male body image disturbance prevalence has been increasing over time and has come to the point in which men dysmorphia is at the similar level as women (Garner, 1997; Murray et al., 2010). Body dissatisfaction in men, in the context of powerful desire to develop masculine physic, may develop of muscle dysmorphia (Grieve, 2007).

Muscle dysmorphia has been originally described and identified in a study for male body builders in 1993 by Pope and colleagues (Pope, Katz & Hudson, 1993). Within this study, Pope and colleagues identified the characteristics of the anorectic symptomology with the sample of male bodybuilders. Within the study, they found that the prevalence of previous anorexia nervosa was much higher than the general population. Though male bodybuilders' anorexic characteristics were opposite form from the standard anorexia nervosa, which is the standard anorexia, the person desires to look skinny and small, but in these male bodybuilders group, the dysmorphia is for ''I am not big enough'' and desire a bigger and more muscular look. Also, people who developed this reverse anorexia, do not want to socialize, and avoid being seen in public or wear heavy clothes under the sun in the summer so that they cannot be seen and perceived with their small body (Murray et al., 2010).

In the context of cognition, the feature of muscle dysmorphia is one's willing to become more masculine even though one's physic is already above the average (Pope, Phillips & Olivardia, 2000). Muscle dysmorphia is usually related with the body image dysmorphic disorder in which it is common to other kinds of body image disorders. Within this dysmorphic body image disorder, individuals spend around 5 hours in a day of their perceived look, the lack of their masculinity and all related obsessive thoughts. When comparing muscle dysmorphia to other kind of body dysmorphic disorders, the persons who have muscle dysmorphia has a greater inside than the persons who has other kinds of dysmorphias, to be exact, the persons who has muscle dysmorphia has 42% very good inside while over 50% is fair inside (Olivardia, Pope, & Hudson, 2000). For the behavioural context, muscle dysmorphia is related to excessive workout routine and high level of anxiety if the workout has been missed and lack of social and professional life responsibilities due to the prioritized workout, proper strict diet and resting etc. Some case reports concluded that muscle dysmorphia may quit jobs that have demands to affect the working out activities or even avoid going to job interviews if it does not suit with the daily workout routine and related duties (Olivardia, 2007). Also, men with muscle dysmorphia have got a rigid diet that they calculate the grams and calories in every item that they consume

and have difficulties eating out at the restaurants if the calories and grams kind of information are not at present (Mossley, 2009).

1.6. Psychological interventions for Body Dysmorphic Disorder

Looking at the literature, to our best of knowledge, there has been no psychological interventional clinical controlled trial has been done specifically for EA, and or AAS dependence, and or Muscle dysmorphia yet. Thus, in this part of the review it has been aimed to explain the closest disorder ''Body dysmorphia disorder (BDD)'' to EA, AAS dependence and muscle dysmorphia. For BDD, there has been quite a big number of studies done both one on one, group and online containing comparison CBT and other psychological interventions (Wilhelm et al., 2011; Philips & Hollander, 2008; Veale, 2004; Wilhelm, Buhlmann, Hayward, Greenberg, & Dimiaite, 2010; Wilhelm & Neziroğlu, 2002). Within the literature, CBT has come up as the most common studied with randomized clinical trials or controlled trails and thus mentioned as the most effective psychological intervention within the schools of psychology for BDD. BDD is a dissatisfied condition in which one's perceived looking is dysmorphic or somehow weird in a way that one is desperately think everybody is mocking him/her. Thus, limiting socializing, avoiding public interactions even with the relationships thinking that one's nose, skin, and hair is so weird in which as people around him or her instantly notice that. Few compulsive behaviours correlate with BDD, like regularly checking on the mirror, making up or somehow camouflage those areas both with dressing and or wearing's. BDD has got high prevalence with depression and suicide attempts (Phillips, 1997).

1.7. Cognitive Behavioural Therapy for Body Dysmorphia Disorder

There is evidence that BDD is responding well to the pharmacotherapy specifically SRI's (Phillips, 1994). There are studies on psychotherapies that may work with BDD in theoretical perspectives. Randomized controlled trials have been increasing with CBT interventions (Veale, 1996; Wilhelm, 1999). Exposure with response prevention change the core beliefs that emphasizes the persons' dissatisfaction of his or her body by focusing on cognitive processes like self-focused attention and rumination. Although both behavioural and cognitive techniques of CBT over isolation and other issues of BDD are documented (Marks, 1988; McKay, 1997), there is much room to fill in terms of combined treatment with pharmacology. Nevertheless, CBT may result in lower relapses rate that those found in pharmacotherapy trials (McKay, 1999). Although the pathogenesis of BDD is not well understood, both psychotherapy and pharmacology have a normalising effect on brain morphology and behavioural change (Boxter, 1992; Ipser, Sander & Stein, 2010). CBT has been used for a long term and a short-term intervention for BDD and has been studied on 6 and 12 months follow ups as well (Rosen, 1995). It has been shown that long term treatment is both possible with CBT only and pharmacology and CBT (McKay, 1997).

CONCLUSION

The emerging health issue has been rising among public all kinds of age group from 12 to 65, as image of the body gets more and more important aspect of life due to the social media and other visual channels. New syndromes come along with development of Muscle dysmorphia in which it causes physical and mental health problems. Muscle dysmorphia is comorbid with exercise addiction, steroid use and performance enhancing drug abuse. In this study, it has been aimed to discuss key characteristics of these phenomenon in both physical and psychological context. Also, it has been discussed body dysmorphic disorder and its relationship with the muscle dysmorphia along with the cognitive behavioural therapy for its recovery. As the muscle dysmorphia has not been accepted as a disorder on its own due to the lack of evidence, it has been focused on the treatment of the closest and most related disorder to muscle dysmorphia which is BDD. CBT and pharmacological treatments are well studied and have promising results

for BDD. It can be concluded that we need more randomized controlled trails for muscle dysmorphia to be classified under the DSM criteria.

REFERENCES

Adams, J. (2009). Understanding exercise dependence. *Journal of Contemporary Psychotherapy*, *39*, 231-240.

Aidman, E. V., & Woollard, S. (2003). The influence of self-reported exercise addiction on acute emotional and physiological responses to brief exercise deprivation. *Psychology of Sport and Exercise*, *4*(3), 225-236.

Allegre, B., Souville, M., Therme, P., & Griffiths, M. (2006). Definitions and measures of exercise dependence. *Addiction research & theory*, *14*(6), 631-646.

Allegre, B., Therme, P., & Griffiths, M. (2007). Individual factors and the context of physical activity in exercise dependence: A prospective study of 'ultra-marathoners'. *International journal of mental health and addiction*, *5*, 233-243.

American Psychiatric Association, DSM-5 Task Force. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5™* (5th ed.). American Psychiatric Publishing, Inc.. https://doi.org/10.1176/appi.books.9780890425596

American Psychiatric Association, A. P., & American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders: DSM-IV* (Vol. 4). Washington, DC: American psychiatric association.

Anderson, SJ, Basson, CJ, Geils, C. & Farman, R. (1997). Personality style and mood states associated with a negative addiction to running. *South African Journal of Sports Medicine*, *4*(4), 6-11.

Baekeland, F. (1970). Exercise deprivation: Sleep and psychological reactions. *Archives of General Psychiatry*, *22*(4), 365-369.

Bates, G., & McVeigh, J. (2016). Image and performance enhancing drugs. *National IPED INFO Survey*.

Baxter, L. R., Schwartz, J. M., Bergman, K. S., Szuba, M. P., Guze, B. H., Mazziotta, J. C., ... & Phelps, M. E. (1992). Caudate glucose metabolic rate changes with both drug and behavior therapy for obsessive-compulsive disorder. *Archives of general psychiatry*, *49*(9), 681-689.

Berczik, K., Szabó, A., Griffiths, M. D., Kurimay, T., Kun, B., Urbán, R., & Demetrovics, Z. (2012). Exercise addiction: Symptoms, diagnosis, epidemiology, and etiology. *Substance use & misuse*, *47*(4), 403-417.

Bjørnebekk, A., Walhovd, K. B., Jørstad, M. L., Due-Tønnessen, P., Hullstein, I. R., & Fjell, A. M. (2017). Structural brain imaging of long- term anabolic-androgenic steroid users and nonusing weightlifters. Biological Psychiatry, 82, 294–302.

Brown, R. I. F. (1997). A theoretical model of the behavioural addictions–applied to offending. *Addicted to crime*, 13-65.

Kerr, J. (1994). *EBOOK: Understanding Soccer Hooliganism*. McGraw-Hill Education (UK).

Calogero, R. M., & Pedrotty, K. N. (2004). The practice and process of healthy exercise: an investigation of the treatment of exercise abuse in women with eating disorders. *Eating disorders*, *12*(4), 273-291.

Cash, T. F. (2005). The influence of sociocultural factors on body image: Searching for constructs. *Clinical Psychology: science and practice*, *12*(4), 438.

Chen, W. J. (2016). Frequent exercise: A healthy habit or a behavioral addiction?. *chronic diseases and translational medicine*, *2*(04), 235-240.

Coomber, R., Pavlidis, A., Santos, G. H., Wilde, M., Schmidt W., & Redshaw, C. (2014). The supply of steroids and other performance and image enhancing drugs (PIEDs) in one English city: Fakes, counterfeits, supplier trust, common beliefs and access. Performance Enhancement & Health, 3(3), 135–144. https://doi.org/10.1016/j.peh.2015.10.004

Corazza, O., & Roman-Urrestarazu, A. (2017). Novel psychoactive sub- stances: Policy, economics and drug regulations. Berlin: Springer (forthcoming).

Downs, D. S., Hausenblas, H. A., & Nigg, C. R. (2004). Factorial validity and psychometric examination of the Exercise Dependence Scale-Revised. *Measurement in physical education and exercise science*, *8*(4), 183-201.

Evans-Brown, M., McVeigh, J., Perkins, C., & Bellis, M. A. (2012). *Human enhancement drugs: the emerging challenges to public health*. North West Public Health Observatory.

Fischer, S., Ehlert, U., & Amiel Castro, R. (2019). Hormones of the hypothalamic-pituitary-gonadal (HPG) axis in male depressive disorders—A systematic review and meta-analysis. Frontiers in Neuroendocrinology, 55, 100792.

GAO. (2002). Dietary supplements for weight loss: Limited federal over- sight has focused more on marketing than on safety. Retrieved from http://www.gao.gov/products/GAO-02-985T

Garfinkel, P. E., Kennedy, S. H., & Kaplan, A. S. (1995). Views on classification and diagnosis of eating disorders. *The Canadian Journal of Psychiatry*, *40*(8), 445-456.

Garner, D. (1997). Body image survey results. *Psychology Today-New York-*, *30*, 30-45.

Graham, M., Ryan, P., Baker, J. S., Davies, B., Thomas, N. E., Cooper, S. M., ... Kicman, A. T. (2009). Counterfeiting in performance and image enhanc- ing drugs. Drug Testing and Analysis, 1(3), 135–142. https://doi.org/ 10.1002/dta.30

Grieve, F. G. (2007). A conceptual model of factors contributing to the development of muscle dysmorphia. *Eating disorders*, *15*(1), 63-80.

Hausenblas, H. A., & Downs, D. S. (2002). How much is too much? The development and validation of the exercise dependence scale. *Psychology and health*, *17*(4), 387-404.

Horwitz, H., Andersen, J. T., & Dalhoff, K. P. (2019). Health consequences of androgenic anabolic steroid use. *Journal of internal medicine*, *285*(3), 333-340.

Ipser, J. C., Sander, C., & Stein, D. J. (2009). Pharmacotherapy and psychotherapy for body dysmorphic disorder. *Cochrane Database of Systematic Reviews*, (1).

Jacobi, L., & Cash, T. F. (1994). In pursuit of the perfect appearance: Discrepancies among self-ideal percepts of multiple physical attributes 1. *Journal of Applied Social Psychology*, *24*(5), 379-396.

Kamber, M., & Mullis, P. E. (2010). The worldwide fight against doping: From the beginning to the World Anti-Doping Agency. Endocrinology and Metabolism Clinics of North America 39: 1–9.

Kaufman, M. J., Janes, A. C., Hudson, J. I., Brennan, B. P., Kanayama, G., Kerrigan, A. R., Jensen, J. E., & Pope, H. G. (2015). Brain and cognition abnormalities in long-term anabolic-androgenic steroid users. Drug and Alcohol Dependence, 152, 47–56.

Lejoyeux, M., Avril, M., Richoux, C., Embouazza, H., & Nivoli, F. (2008). Prevalence of exercise dependence and other behavioral addictions among clients of a Parisian fitness room. *Comprehensive psychiatry*, *49*(4), 353-358.

Marks, I., & Mishan, J. (1988). Dysmorphophobic avoidance with disturbed bodily perception: A pilot study of exposure therapy. *The British journal of psychiatry*, *152*(5), 674-678.

Maughan, R. J., King, D. S., & Lea, T. (2004). Dietary supplements. Journal of Sports Sciences, 22(1), 95–113.

Mazzoni, I., Barroso, O., & Rabin, O. (2017). Anti-doping challenges with novel psychoactive substances in sport. *Novel Psychoactive Substances: Policy, Economics and Drug Regulation*, 43-56.

McHenry, J., Carrier, N., Hull, E., & Kabbaj, M. (2014). Sex differences in anxiety and depression: Role of testosterone. Frontiers in Neuroendocrinology, 35, 42–57.

McKay, D. (1999). Two-year follow-up of behavioral treatment and maintenance for body dysmorphic disorder. *Behavior modification*, *23*(4), 620-629.

Molinero, O., & Márquez, S. (2009). Use of nutritional supplements in sports: risks, knowledge, and behavioural-related factors. Nutr Hosp, 24(2), 128–134.

Mooney, R., Simonato, P., Ruparelia, R., Roman-Urrestarazu, A., Martinotti, G., & Corazza, O. (2017). The use of supplements and performance and image enhancing drugs in fitness settings: A exploratory cross-sectional investigation in the United Kingdom. *Human Psychopharmacology: Clinical and Experimental*, *32*(3), e2619.

Morrison, L. J., Gizis, F., & Shorter, B. (2004). Prevalent use of dietary sup- plements among people who exercise at a commercial gym. International Journal of Sport Nutrition and Exercise Metabolism, 14(4), 481–492.

Mosley, P. E. (2009). Bigorexia: bodybuilding and muscle dysmorphia. *European Eating Disorders Review: The Professional Journal of the Eating Disorders Association*, *17*(3), 191-198.

Murray, S. B., Maguire, S., Russell, J., & Touyz, S. W. (2012). The emotional regulatory features of bulimic episodes and compulsive exercise in muscle dysmorphia: A case report. *European Eating Disorders Review*, *20*(1), 68-73.

Murray, S. B., Rieger, E., Touyz, S. W., & De la Garza García, Lic, Y. (2010). Muscle dysmorphia and the DSM-V conundrum: Where does it belong? A review paper. *International Journal of Eating Disorders*, *43*(6), 483-491.

Nackeeran, S., Patel, M. S., Nallakumar, D. T., Ory, J., Kohn, T., Deibert, C. M., Carto, C., & Ramasamy, R. (2022). Testosterone therapy is associated with depression, suicidality, and intentional self-harm: Analysis of a national federated database. The Journal of Sexual Medicine, 19, 933–939.

Nead, K. T. (2019). Androgens and depression: A review and update. Current Opinion in Endocrinology, Diabetes & Obesity, 26, 175–179.

Neziroglu, F. A., & Yaryura-Tobias, J. A. (1993). Body dysmorphic disorder: phenomenology and case descriptions. *Behavioural and Cognitive Psychotherapy*, *21*(1), 27-36.

Olivardia, R., Pope Jr, H. G., & Hudson, J. I. (2000). Muscle dysmorphia in male weightlifters: A case-control study. *American Journal of Psychiatry*, *157*(8), 1291-1296.

Olivardia, R. (2007). Muscle Dysmorphia: Characteristics, Assessment, and Treatment.

Pope Jr, H. G., Gruber, A. J., Choi, P., Olivardia, R., & Phillips, K. A. (1997). Muscle dysmorphia: An underrecognized form of body dysmorphic disorder. *Psychosomatics*, *38*(6), 548-557.

Pope Jr, H. G., Katz, D. L., & Hudson, J. I. (1993). Anorexia nervosa and "reverse anorexia" among 108 male bodybuilders. *Comprehensive psychiatry*, *34*(6), 406-409.

Pope, H., Phillips, K. A., & Olivardia, R. (2000). *The Adonis complex: The secret crisis of male body obsession*. Simon and Schuster.

Pope Jr, H. G., Wood, R. I., Rogol, A., Nyberg, F., Bowers, L., & Bhasin, S. (2014). Adverse health consequences of performance-enhancing drugs: an Endocrine Society scientific statement. *Endocrine reviews*, *35*(3), 341-375.

Rasmussen, J. J., Selmer, C., Østergren, P. B., Pedersen, K. B., Schou, M., Gustafsson, F., Faber, J., Juul, A., & Kistorp, C. (2016). Former abusers of anabolic androgenic steroids exhibit decreased testoster- one levels and hypogonadal symptoms years after cessation: A case- control study. PLoS One, 11, e0161208.

Ricciardelli, L. A., McCabe, M. P., & Banfield, S. (2000). Body image and body change methods in adolescent boys: Role of parents, friends and the media. *Journal of psychosomatic research*, *49*(3), 189-197.

Sagoe, D., McVeigh, J., Bjørnebekk, A., Essilfie, M. S., Andreassen, C. S., & Pallesen, S. (2015). Polypharmacy among anabolic-androgenic steroid users: A descriptive metasynthesis. Substance Abuse Treatment, Prevention, and Policy, 10, 12.

Sell, A., Lukazsweski, A. W., & Townsley, M. (2017). Cues of upper body strength account for most of the variance in men's bodily attractiveness [Internet]. Proceedings of the Royal Society of Biological Science, 284(1869), 20171819.

Shepherd, C. (2001). Pacing and exercise in chronic fatigue syndrome. *Physiotherapy*, *87*(8), 395-396.

Smit, D. L., Buijs, M. M., Hon, O., Heijer, M., & Ronde, W. (2021). Positive and negative side effects of androgen abuse. The HAARLEM study: A one-year prospective cohort study in 100 men. Scandinavian Journal of Medicine & Science in Sports, 31, 427–438.

Sussman, S., Lisha, N., & Griffiths, M. (2011). Prevalence of the addictions: a problem of the majority or the minority?. *Evaluation & the health professions*, *34*(1), 3-56.

Szabo, A., & Griffiths, M. D. (2007). Exercise addiction in British sport science students. *International Journal of Mental Health and Addiction*, *5*, 25-28.

Szabo, A. (2010). *Addiction to Exercise: A Symptom Or a Disorder?*. Nova Science Publishers, Incorporated.

Thevis, M., Schrader, Y., Thomas, A., Sigmund, G., Geyer, H., & Schänzer, W. (2008). Analysis of confiscated black market drugs using chromatographic and mass spectrometric approaches. *Journal of analytical toxicology*, *32*(3), 232-240.

Thome, J. L., & Espelage, D. L. (2007). Obligatory exercise and eating pathology in college females: Replication and development of a structural model. *Eating Behaviors*, *8*(3), 334-349.

Veale, D., Gournay, K., Dryden, W., Boocock, A., Shah, F., Willson, R., & Walburn, J. (1996). Body dysmorphic disorder: a cognitive behavioural model and pilot randomised controlled trial. *Behaviour research and therapy*, *34*(9), 717-729.

Verroken, M. (2000). Drug use and abuse in sport. Baillières Best Pract. Res. Clin. Endocrinol. Metab 14:1–23.

Chen, W. J. (2016). Frequent exercise: A healthy habit or a behavioral addiction?. *chronic diseases and translational medicine*, *2*(04), 235-240.

Walsh, B. T. (2007). DSM-V from the perspective of the DSM-IV experience. *International Journal of Eating Disorders*, *40*(S3), S3-S7.

Wilhelm, S., Otto, M. W., Lohr, B., & Deckersbach, T. (1999). Cognitive behavior group therapy for body dysmorphic disorder: a case series. *Behaviour research and therapy*, *37*(1), 71-75.

Windfeld-Mathiasen, J., Christoffersen, T., Strand, N. A. W., Dalhoff, K., Andersen, J. T., & Horwitz, H. (2022). Psychiatric morbidity among men using anabolic steroids. *Depression and anxiety*, *39*(12), 805-812.

World Anti-Doping Agency. (2016). Therapeutic use exemption guidelines. Retrieved from https://wada-main-prod.s3.amazonaws.com/ resources/files/wada-tue-guidelines-v8.0-en.pdf

WorldHealthOrganization(WHO).PhysicalActivity.http://www. who.int/mediacentre/factsheets/fs385/en/. Accessed November 20, 2016.

EXTENDED ABSTRACT

GENİŞLETİLMİŞ ÖZET

ANTRENMAN, ANABOLİK STEROİD BAĞIMLILIĞI, PERFORMANS ARTTIRICI İLAÇ KULLANIMI, KAS DİSMORFİSİ

Giriş ve Araştırma Amacı: Günümüzde görsel medyanın ve sosyal medya platformlarının hızla ilerlemesi, toplumun estetik algısında ve bireylerin günlük yaşam alışkanlıklarında dönüştürücü bir rol oynamaktadır. Bu ilerleme, kişilerin kendi beden algıları üzerinde derin bir etkiye sahiptir ve özellikle genç nesiller arasında, idealize edilen vücut imgelerine duyulan takıntının artmasına yol açmaktadır. Kas dismorfisi sendromu, bu bağlamda, egzersiz bağımlılığı ile başlayan ve giderek katı diyet uygulamaları, Anabolik androjenik steroidler ile performans artırıcı ilaçların kötüye kullanımı gibi sağlık risklerini barındıran bir davranış zincirine dönüşen psikolojik bir durum olarak karşımıza çıkmaktadır.

Bu derleme çalışmasının amacı, kas dismorfisi sendromunun yarattığı sağlık sorunlarına ve bu sendromun bireylerin fiziksel ve psikolojik sağlığı üzerindeki etkilerine dikkat çekmektir. Ayrıca, bu sendromun belirtileri, sebepleri ve yaygınlığı ile mücadele yöntemleri üzerine mevcut literatürün kapsamlı bir analizini sunarak, kas dismorfisi sendromunun karakteristik özelliklerini ve bu sendromla mücadelede kullanılabilecek potansiyel stratejileri ortaya koymayı hedeflemektedir. Araştırmanın sonucunda, sosyal medyanın kişisel sağlık üzerindeki etkilerine dair daha derin bir anlayış geliştirilmesi ve bu alanda farkındalığın artırılması amaçlanmaktadır.

Literatür İncelemesi:

Egzersiz bağımlılığı, kas dismorfisi sendromunun temel taşlarından birini oluşturur. Yoğun egzersiz programlarına sıkı sıkıya bağlı kişiler, günlerinin önemli bir kısmını spor salonlarında geçirirler. Bu bağlılık, zamanla kişisel, sosyal ve mesleki yaşamlarının üzerinde baskın bir etkiye sahip olabilir. Spor salonunda geçirilen saatler arttıkça, kişiler iş görüşmeleri, sosyal etkinlikler ve ailevi yükümlülükler gibi önemli yaşam alanlarını ihmal edebilirler. Bu tür bir bağımlılık, yaşamın diğer alanlarındaki performansı ve ilişkileri ciddi şekilde etkileyebilir ve bireylerin sosyal işlevselliğini sınırlayabilir.

Diyet uygulamaları da kas dismorfisi sendromunun bir başka yönünü oluşturur. Özellikle sosyal etkileşimler ve yemek yeme alışkanlıkları üzerinde derin bir etki yaratan katı diyetler, bireylerin sosyal hayatlarını ve beslenme çeşitliliklerini önemli ölçüde kısıtlayabilir. Kas dismorfisi olan bireyler, beslenmelerini o kadar kontrol altında tutarlar ki, bu durum toplumsal faaliyetlere katılımlarını ve sosyal etkileşimlerini engelleyebilir.

Anabolik androjenik steroidler ve performans artırıcı ilaçların kötüye kullanımı da kas dismorfisinin belirgin özelliklerindendir. Bu maddelerin kullanımı, arzu edilen vücut görünümüne ulaşma hedefine yönelik bir arayışa dönüşebilir. Bireyler, genellikle doğal yollarla elde edilemeyecek bir kaslılık ve vücut gelişimini hızlandırmak için bu tür ilaçlara başvururlar. Ancak, bu ilaçların kullanımı ciddi sağlık riskleri taşır ve uzun vadede hem fiziksel hem de psikolojik zararlara yol açabilir.

Kas dismorfisi, henüz yeterli kanıt bulunmaması nedeniyle Amerikan Psikiyatri Birliği (APA) tarafından bağımsız bir bozukluk olarak tanınmamıştır. Bunun yerine, genellikle vücut dismorfik bozukluğu veya yeme bozuklukları gibi mevcut kategoriler altında incelenir. Bu durum, kas dismorfisinin benzersiz özelliklerinin ve tedavi yaklaşımlarının daha fazla araştırma ve dikkat gerektirdiğini göstermektedir. İlgili alanlarda yapılacak daha fazla çalışma, kas dismorfisi sendromunun daha iyi anlaşılmasını ve etkili müdahale yöntemlerinin geliştirilmesini sağlayacaktır.

Metodoloji ve Bulgular:

Kas dismorfisi, ideal vücut imajına takıntı ve egzersiz yapma, diyet gibi kompulsif davranışları geliştirme ile karakterizedir. Kas dismorfisini bir bağımlılık veya obsesif-kompulsif bozukluk altında kategorize edebilmek için APA'nın daha fazla kanıta ihtiyacı vardır, örneğin daha fazla randomize kontrollü klinik deneylere. Literatüre bakıldığında, kas dismorfisinin tedavi yönünde bazı iyileşmeler görülmüştür; buna göre bilişsel davranışçı terapi, standart farmakoterapi ile uygulanmış ve olumlu sonuçlar elde edilmiştir. Bilişsel davranışçı terapi, sıkıntı, anksiyete ve depresyon gibi semptomları azaltır. Ayrıca, kas dismorfisi sendromlarıyla ilişkilendirilen temel inançlar, kompulsif davranışlar, takıntılı düşünceler, gerçekçi olmayan hedefler üzerinde çalışmaya da yardımcı olur.

Sonuçlar ve Öneriler:

Kas dismorfisi, yeme bozuklukları, bağımlılık bozuklukları, anabolik androjenik steroid kötüye kullanımı, obsesif-kompulsif bozukluk ile ilişkilendirilmiş ve çok boyutlu fenomeni içerisinde kendi özelliklerine sahiptir. Bu fenomen dahilinde, kas dismorfik kişiler diğer bozuklukların semptomlarını gösterebilir fakat gerçekte bu bozukluklardan biri altında olmayabilir çünkü kendi boyutlu özelliklerine sahiptir, örneğin, bağımlılık ve takıntılı düşünceler ile kompulsif davranışlar gibi. Kas dismorfisi için bilişsel davranışçı terapi, standart farmakolojik tedavi ile birlikte kullanılmıştır. Klinik deneyler uygulanmış ve kas dismorfisi semptomlarını azaltmıştır. Kendi başına sınıflandırılabilmesi veya doğru bozukluk altında yer alabilmesi için daha fazla klinik kontrollü deney yapılmalıdır. Daha fazla araştırma, uzun vadede bu sınıflandırma fenomenine ışık tutacaktır.

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