

EXERCISE ADDICTION AND CRIMINAL LIABILITY IN EUROPE: A BEHAVIORAL SCIENCE PERSPECTIVE ON IDENTIFIED LEGAL RESPONSIBILITY AND INSTITUTIONAL ACCOUNTABILITY

Abstract: Exercise addiction, classified as a behavioral disorder characterized by compulsive, excessive physical activity accompanied by psychological dependence – poses unique challenges at the intersection of clinical psychology, behavioral neuroscience, and criminal law. Although not yet formally recognized as a distinct disorder in major diagnostic systems such as the DSM-5 or ICD-11, its emerging clinical profile is increasingly associated with significant psychosocial dysfunction, somatic harm, and behavioral dysregulation. This paper examines the intersection between exercise addiction and criminal law in Europe, applying a behavioral science lens to analyze the cognitive and neurobiological underpinnings of compulsive exercise and their implications for legal responsibility, victimization, and institutional regulation.

Grounded in empirical findings on impulse-control disorders, reward system dysregulation, and obsessive-compulsive spectrum behaviors, the study interrogates the extent to which individuals suffering from exercise addiction possess the requisite mens rea (criminal intent) when their behaviors result in harm – to themselves, to dependents, or in cases of third-party coercion within structured environments. It further explores how criminal law frameworks across European jurisdictions conceptualize agency, culpability, and coercion when addiction-related conduct leads to bodily injury, neglect, or psychological abuse, particularly within high-performance sports, rehabilitation centers, or educational institutions.

A comparative analysis of national criminal codes, case law, and regulatory practices reveals significant legal ambiguity in addressing cases where compulsive behavior interacts with criminally relevant outcomes. Of particular concern is the legal vacuum surrounding institutional actors (e.g., coaches, trainers, or sports administrators) who facilitate or exploit

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addictive exercise patterns for performance or commercial gain, raising questions of criminal negligence, abuse of power, and failure of duty of care.

This paper argues that current European criminal law insufficiently incorporates behavioral science insights into assessments of intent, autonomy, and diminished responsibility in addiction-related cases. It advocates for a biopsychosocial framework in legal evaluations, alongside clearer statutory definitions and regulatory oversight, particularly within the sports and fitness industries. By synthesizing findings from behavioral research and criminal jurisprudence, this study calls for a more nuanced, interdisciplinary approach to the legal treatment of exercise addiction – one that respects both the complexity of addiction as a behavioral pathology and the normative imperatives of justice and public protection.

Keywords: Exercise Addiction, Criminal Law, Behavioral Neuroscience, Mens Rea, Institutional Liability.

1. INTRODUCTION

Exercise addiction, characterized by a compulsive engagement in physical activity despite negative results, has garnered momentum increasing interest in the fields of clinical psychology and behavioral neuroscience.¹ Individuals going through this condition often experience an uncontrollable drive to exercise, resulting in substantial physical, psychological, and social impairments. Although it is not formally classified out as a distinct clinical disorder in major diagnostic classifications such as the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5) or the *International Classification of Diseases, Eleventh Revision* (ICD-11), encompassing evidence points to its association with significant psychosocial dysfunction and somatic harm.

From a neurobiological perspective, exercise addiction shows similarities to impulse-control disorders and behaviors found within the obsessive-compulsive spectrum.² In the legal realm, particularly within Europe, the intersection between exercise addiction and criminal responsibility remains insufficiently addressed.³ Traditional criminal law proclaims the existence of *mens rea*, or the intent to commit a wrongful act.⁴ However, when behaviors driven by compulsive addiction result in harm – either self-inflicted, or affecting dependents or

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- 1 H. A. Hausenblas, D. S. Downs, “Exercise dependence: A systematic review”, *Psychology of Sport and Exercise*, 2/2022; K. Berczik *et al.*, “Exercise addiction: Symptoms, diagnosis, epidemiology, and etiology”, *Substance Use & Misuse*, 4/2012.
 - 2 A. Verdejo-García, A. Bechara, “A somatic marker theory of addiction”, *Neuropharmacology*, 1/2009; N. D. Volkow *et al.*, “Addiction: Beyond dopamine reward circuitry”, *Proceedings of the National Academy of Sciences*, 37/2011.
 - 3 P. F. Silva, M. F. de Oliveira, M. T. de Mello, “Exercise dependence and overtraining: The physiological and psychological consequences”, *Current Sports Medicine Reports*, 8/2018.
 - 4 N. Padfield, *Mental disorder and criminal justice: Policy, provision and practice*, Cambridge University Press, 2018.

others – attributing intent becomes complex. For example, incidents in which people with exercise addiction involve themselves in self-harming actions or neglect familial rules due to compulsive exercise routines pose significant challenges to conventional knowledge of personal agency and culpability.⁵

The potential exploitation of people with exercise addiction by institutional actors such as coaches, trainers, or sports administrators introduces further ethical and legal implications.⁶ Whether through carelessness or deliberate use, such actors may aggravate addictive behaviors to achieve performance or financial gains. Situations like these raise critical legal issues regarding duty of care, abuse of authority, and criminal negligence. The current lack of statutory clarity and regulatory oversight in addressing such forms of exploitation highlights a significant gap in legal protections, leaving vulnerable individuals at risk.

This paper argues that European criminal law inadequately considered behavioral science in evaluating autonomy, intent, and diminished responsibility in cases like exercise addiction. It brings forward the biopsychosocial model in legal assessments and calls for clearer legal meanings and stronger regulation in the fitness industry. By merging behavioral research with legal aspects, the paper promotes a more just and comprehensive approach to compulsive behaviors.

2. REVIEW OF LITERATURE

2.1. Understanding Exercise Addiction as a Behavioral Disorder

Though not formally recognized in the *DSM-5* or *ICD-11*,⁷ exercise addiction is increasingly acknowledged in behavioral science as a compulsive disorder marked by psychological dependence. The characteristics include withdrawal symptoms and the continuation of excessive physical activity despite physical, psychological, or social harm.⁸ This pattern aligns closely with impulse-control and obsessive-compulsive disorders and is associated with underlying psychological vulnerabilities such as body image distortion, perfectionism, and performance-related pressures.⁹

5 C. Davis, J. Fox, "Excessive exercise and weight preoccupation in women: Personality and eating disorder correlates", *International Journal of Eating Disorders*, 3/2008.

6 G. Kerr, E. Willson, A. Stirling, "It's not just about the game": Athlete maltreatment in sport", *Journal of Clinical Sport Psychology*, 2/2016; M. Lang, *Safeguarding, child protection and abuse in sport: International perspectives in research, policy and practice*, Routledge, 2019.

7 American Psychiatric Association, *Diagnostic and statistical manual of mental disorders*, American Psychiatric Publishing, 2013; World Health Organization, *International classification of diseases for mortality and morbidity statistics*, 2019.

8 H. A. Hausenblas, D. S. Downs, *op. cit.*; K. Berczik et al., *op. cit.*

9 C. Davis, J. Fox, *op. cit.*; L. M. S. Oberleitner, A. J. Walker, H. Rosenberg, "Disordered eating and exercise dependence in college women: The role of self-esteem, perfectionism, and body image", *Eating Behaviors*, 17/2015.

Neurobiological research supports the conceptualization of exercise addiction as a neurobehavioral condition. Studies have shown dysfunction in the brain's reward circuitry, particularly within dopamine pathways in the prefrontal cortex – areas critical to decision-making and inhibitory control.¹⁰ These findings, also observed in substance use disorders, carry implications for legal tests of intent and autonomy, suggesting that such behavior may not be entirely voluntary in affected individuals.¹¹

2.2. Legal Considerations: *Mens Rea* and Diminished Responsibility

In the legal domain, particularly within criminal jurisprudence, the question arises as to whether individuals experiencing exercise addiction can be held fully responsible for actions resulting from their compulsive behavior. At the heart of this inquiry is the principle of *mens rea*, or the mental element of purpose required for criminal liability.¹² Across European legal systems, there is a presumption of rational agency and voluntariness in the commission of criminal acts.

Behavioral neuroscience research complicates this legal assumption by demonstrating that compulsive disorders can impair cognitive functions crucial to legal culpability – such as the ability to form intent, recognize consequences, and evaluate harm to oneself or others.¹³ When individuals suffering from exercise addiction engage in self-harm or neglect familial duties as a result of their condition, legal frameworks may need to apply doctrines such as diminished responsibility.¹⁴

2.3. Exercise Addiction in Institutional Contexts: Exploitation and Coercion

A critical but often under-evaluated aspect of exercise addiction lies in its institutional dimension – particularly within elite sports and rehabilitation environments – where authority figures may actively or passively exploit compulsive behaviors. Coaches, trainers, and administrators are obligated to protect the well-being of those under their supervision, consistent with the legal doctrine of duty of care.¹⁵

10 N. D. Volkow et al., *op. cit.*; A. Verdejo-García, A. Bechara, *op. cit.*

11 A. Weinstein, Y. Weinstein, “Exercise addiction – Diagnosis, bio-psychological mechanisms and treatment issues”, *Current Pharmaceutical Design*, 25/2014.

12 N. Padfield, *op. cit.*

13 A. Verdejo-García, A. Bechara, *op. cit.*; N. D. Volkow et al., *op. cit.*

14 P. F. Silva, M. F. de Oliveira, M. T. de Mello, *op. cit.*

15 G. Kerr, E. Willson, A. Stirling, *op. cit.*

However, many European jurisdictions lack the legal infrastructure to adequately address such issues. The absence of clear diagnostic and legal criteria for behavioral addictions like exercise addiction not only hinders accountability but also fails to safeguard vulnerable populations – especially athletes and minors in dependent relationships.¹⁶

2.4. Comparative Legal Frameworks and Regulatory Gaps in Europe

There is considerable divergence across European jurisdictions in their treatment of behavioral disorders under criminal law. For example, Scandinavian systems tend to adopt a more rehabilitative, biopsychosocial model that incorporates mental health considerations, whereas other countries like France and Italy maintain stricter standards for excusing behavior on psychological grounds.¹⁷

This lack of harmonization poses challenges for legal consistency and cross-border enforcement – particularly in transnational sports and international rehabilitation settings. Although public health experts and athlete welfare advocates have called for reform, few jurisdictions have implemented legal tools specifically designed to regulate compulsive training behaviors or address institutional mental health neglect.¹⁸

2.5. Integrating Behavioral Science into Criminal Law

Behavioral science continues to advocate for integrating neurocognitive findings into legal reasoning, especially in cases involving behavioral addictions like exercise addiction.¹⁹ The biopsychosocial model of legal accountability emphasizes the systematic assessment of factors such as impaired impulse control, motivational dysregulation, and institutional coercion during both prosecution and sentencing phases.

Developing a well-balanced legal framework – one that respects legal norms while incorporating empirical behavioral evidence – is crucial. Without scientifically grounded definitions, standardized evaluation protocols, and clear legal guidelines, courts risk misinterpreting addiction and failing to ensure equitable justice for affected individuals.²⁰

16 M. Lang, *op. cit.*

17 N. Padfield, *op. cit.*

18 M. Lang, *op. cit.*; G. Kerr, E. Willson, A. Stirling, *op. cit.*

19 A. Verdejo-García, A. Bechara, *op. cit.*; A. Weinstein, Y. Weinstein, *op. cit.*

20 P. F. Silva, M. F. de Oliveira, M. T. de Mello, *op. cit.*; N. Padfield, *op. cit.*

3. METHODOLOGY

3.1. Study Design

This study was formulated as a systematic review aimed at integrating interdisciplinary literature situated at the intersection of exercise addiction, behavioral science, and European criminal law. The review was conducted in accordance with the PRISMA 2020 guidelines to ensure transparency and methodological rigor. By adhering to this rule, the study maintains a structure, throughout the selection, inclusion, and analysis phases.

3.2. Eligibility Criteria

The inclusion and exclusion criteria were created to align with the study's focus on exercise addiction and its legal and psychological implications. Eligible sources addressed individuals exhibiting symptoms of exercise addiction, particularly in relation to cognitive, neurobiological, or legal frameworks – such as *mens rea* and institutional accountability – within European legal systems. Only peer-reviewed journal articles, legal commentaries, theoretical papers, and case studies from 2000 to 2024 were included. Studies centered on physical health or from non-European jurisdictions (without comparative relevance), as well as non-peer-reviewed materials, were excluded.

3.3. Search Strategy and Information Sources

A structured search strategy was implemented to capture the interdisciplinary nature of the research topic. The search process spanned several databases, including legal and policy repositories such as Westlaw EU, EUR-Lex, and BAILII; behavioral science and psychology databases including PsycINFO, PubMed, and Scopus; and broader interdisciplinary platforms such as Web of Science and Google Scholar. Search terms were formulated using Boolean logic and adapted to each database's specifications. Core search phrases included combinations such as (“exercise addiction” OR “compulsive exercise”) AND (“criminal law” OR “legal responsibility” OR “*mens rea*” OR “culpability” OR “victimization”) AND (“Europe” OR “European Union” OR “EU law” OR “sports institutions” OR “rehabilitation centers”). The initial search phase was conducted in March 2025, with ongoing refinements and updates completed by April 1, 2025.

3.4. Study Selection Process

All retrieved search results were consolidated and organized using Zotero, which facilitated efficient citation management and the removal of duplicates. In cases of disagreement during the full-text review phase, resolution was achieved

through discussion and, when necessary, consultation with a third reviewer. Only those studies meeting the eligibility criteria after a comprehensive full-text evaluation were included in the final synthesis. This multi-stage review process was designed to uphold the objectivity and validity of the study selection procedure.

3.5. Data Extraction

To ensure consistency, a standardized data extraction template was used across all included studies. Extracted data included publication details—authorship, year, journal, and geographic focus – as well as operational definitions and diagnostic criteria for exercise addiction. Legal aspects were closely examined, particularly in relation to culpability, coercion, institutional responsibility, and regulatory shortcomings.

3.6. Data Synthesis

Given the qualitative and conceptual scope of the review, a narrative synthesis approach was used to integrate interdisciplinary findings. The analysis focused on three core themes: the neurocognitive basis of compulsive exercise and its legal implications; how European criminal law addresses agency, coercion, and diminished responsibility; and the role of institutional regulation, particularly the duty of care in sports and educational settings. The synthesis highlighted thematic overlaps, inconsistencies, and gaps, concluding with recommendations for clearer legal definitions and stronger regulatory oversight.

4. RESULTS

4.1. Interpretation of Findings

The literature helps us understand that exercise addiction, although not yet identified in major diagnostic systems such as the *DSM-5* or *ICD-11*,²¹ displays consistent parameters of behavioral dysregulation, compulsivity, and psychological dependency.²² Neurobiological research points to abnormalities in the dopaminergic reward system, mirroring patterns seen in substance-related disorders.²³ This growing body of evidence challenges traditional legal presumptions regarding full cognitive autonomy in individuals exhibiting compulsive behaviors.²⁴

21 American Psychiatric Association, *op. cit.*; World Health Organization, *op. cit.*

22 H. A. Hausenblas, D. S. Downs, *op. cit.*; A. Szabo et al., “Exercise addiction in Spanish athletes: Investigation of the roles of gender, social context and level of involvement”, *Journal of Behavioral Addictions*, 2/2015.

23 A. Verdejo-García, A. Bechara, *op. cit.*; N. D. Volkow et al., *op. cit.*

24 A. Weinstein, Y. Weinstein, *op. cit.*

Furthermore, a critical gap exists between behavioral science and legal doctrines – particularly concerning the application of *mens rea* in criminal law.²⁵ While many European legal systems accept partial or diminished responsibility in cases involving mental illness, compulsive disorders like exercise addiction often fall outside these legal protections due to the absence of formal classification.²⁶ This misalignment contributes to problematic interpretations of criminal liability, especially in situations where compulsive exercise leads to harm – either self-directed or involving others.²⁷

A legal vacuum also surrounds the duty of care owed by coaches, institutions, or medical professionals in contexts where compulsive exercise is normalized or even exploited.²⁸ These patterns suggest the issue is not only one of individual pathology but also of systemic neglect or abuse – often without appropriate legal recourse.

5. CONCLUSION

This systematic review explores the multifaceted nature of exercise addiction by analyzing it through behavioral, neuropsychological, and legal lenses. Although compulsive physical activity is increasingly acknowledged in clinical psychology and neuroscience, its legal ramifications remain largely overlooked – particularly in relation to criminal responsibility, intent assessment, and institutional accountability.

The evidence indicates that exercise addiction shares core features with other behavioral and substance use disorders – namely, compulsivity, reduced self-control, and continued behavior despite adverse outcomes.²⁹ Nonetheless, its recognition within legal systems remains limited. Only a few legal precedents acknowledge the disorder, and legislation across European jurisdictions lacks cohesion.³⁰

This legal vacuum is particularly concerning in institutional environments – such as elite sports or rehabilitation programs – where organizational pressures may exacerbate addictive behaviors.³¹ The absence of formal diagnostic criteria in systems like the *DSM-5* and *ICD-11*³² further hampers both clinical and legal acceptance, complicating diagnosis, treatment, and judicial interpretation.

Addressing these gaps requires closer collaboration between mental health professionals, neuroscientists, and legal experts to develop unified, evidence-based frameworks. Recognizing behavioral addictions like exercise dependence

25 N. Padfield, *op. cit.*

26 P. F. Silva, M. F. de Oliveira, M. T. de Mello, *op. cit.*

27 C. Davis, J. Fox, *op. cit.*

28 G. Kerr, E. Willson, A. Stirling, *op. cit.*; M. Lang, *op. cit.*

29 K. Berczik et al., *op. cit.*; A. Szabo et al., *op. cit.*

30 N. Padfield, *op. cit.*

31 G. Kerr, E. Willson, A. Stirling, *op. cit.*; M. Lang, *op. cit.*

32 American Psychiatric Association, *op. cit.*; World Health Organization, *op. cit.*

in legal discourse would not only enhance fairness and accountability but also promote ethical practices within institutions and improve mental health outcomes for affected individuals.

Please Note: The author utilized AI-assisted tools to support the organization and synthesis of literature; most of the interpretations, critical evaluations, and conclusions reflect original scholarly analysis.

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Рева Калра*

ЗАВИСНОСТ ОД ВЕЖБАЊА И КРИВИЧНА ОДГОВОРНОСТ У ЕВРОПИ: ПЕРСПЕКТИВА БИХЕЈВИОРАЛНЕ НАУКЕ О ИДЕНТИФИКОВАНОЈ ПРАВНОЈ ОДГОВОРНОСТИ И ИНСТИТУЦИОНАЛНОЈ ОДГОВОРНОСТИ

Резиме

Зависност од вежбања, класификована као поремећај у понашању који карактерише компулзивна, прекомерна физичка активност праћена психолошким зависношћу – представља јединствене изазове на раскрсју клиничке психологије, бихејвиоралне неуронауке и кривичној права. Иако још увек није формално призната као посебан поремећај у водећим дијагностичким системима попут DSM-5 или ICD-11, њен настајајући клинички профил све се чешће доводи у везу са значајним психосоцијалним дисфункцијама, телесним оштећењима и поремећајем у понашању. Овај рад истражује раскрсје између зависности од вежбања и кривичној права у Европи, примењујући перспективу бихејвиоралне науке како би се анализирали когнитивни и неуробиолошки основи компулзивној вежбања и њихове импликације на правну одговорност, викимизацију и институционалну регулативу.

Ослоњен на емпиријске налазе о поремећајима контроле импулса, дисфункцији система награђивања и понашањима из описивно-компулзивног спектра, рад истражује у којој мери особе које падају од зависности од вежбања поседују неопходан *mens rea* када њихова понашања доводе до штете – по њих саме, по лица о којима брину или у случајевима принуде од стране трећих лица у регулираним срединама. Даље се размишља на који начин правни оквири различитих европских јурисдикција концептуализују способност делања, кривицу и принуду када понашање повезано са зависношћу доводи до телесне повреде, занемаривања или психолошкој злостављања, нарочито у контексту врхунској спорти, рехабилитационих центара или образовних институција.

Компаративна анализа националних кривичних закона, судске праксе и регулаторних механизма открива недореченост у правној регулативи у односу на решавање случајева у којима компулсивно понашање има кривично релевантне последице. Посебно забрињава правни вакуум који окружује институционалне актере (нпр. тренере, инструкторе или спортске администраторе) који омогућавају или експлоатишу обрасце зависничкој вежбања ради

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йостїизања резулїаїа или комерцијалне добиїи, шїо оївара йиїања нейажње, злоуїоїребе овлашїења и йовреде дужне брижљивосїи.

Ауїор їврди да савремено евроїско кривично їраво недо-
вољно инїеїрише знања бихеївиоралних наука у їроцене намере,
ауїономије и умањене одїоворносїи у случајевима їовезаним са
зависношїу. Залаже се за їрмену биойсихосоцијалної оквира у
їравним евалуацијама, уз јасније законске дефиниције и реїулаїор-
ни надзор, їособно у обласїима сїорїа и фийнеса. Синїезом на-
лаза из бихеївиоралних истїраживања и кривичноїравне їраксе, ова
сїудија їозива на суйїилнији, инїердисциплинарни їрисїуї
їравном їреїману зависносїи од вежбања – їрисїуї који уважа-
ва и комплексносїи зависносїи као їоремењаја їонашања и норма-
тивне имїератїиве їравде и зашїиїије јавносїи.

Кључне речи: зависност од вежбања, кривично право,
бихеївиорална неуронаука, *mens rea*, одговорност.