

# Sports, Exercise and Mental Health among Individuals with Disabilities: A Cross-Sectional Study

Dragan Glavaš<sup>1</sup>, Lara Puhovski<sup>1</sup>, Krunoslav Matešić<sup>1</sup>

<sup>1</sup>University Department of Psychology  
Catholic University of Croatia  
Zagreb, Croatia

Dragan Glavaš  
[dragan.glavas@unicath.hr](mailto:dragan.glavas@unicath.hr)  
ORCID: 0000-0002-5950-855X

Lara Puhovski  
[lara.puhovski8@gmail.com](mailto:lara.puhovski8@gmail.com)

Krunoslav Matešić  
[krunoslav@matesic@unicath.hr](mailto:krunoslav@matesic@unicath.hr)  
ORCID: 0000-0003-3568-2892

---

## Corresponding author:

Dragan Glavaš  
Catholic University of Croatia  
Ilica 244, 10000 Zagreb, Croatia  
[dragan.glavas@unicath.hr](mailto:dragan.glavas@unicath.hr)

---

## Abstract

**Background:** Engaging in physical activity (PA) offers substantial benefits for both physical and mental health, which is particularly significant for vulnerable populations, including individuals with disabilities. Research indicates that PA can enhance mental well-being in these groups, though more studies are needed to fully understand this relationship.

**Aim:** The aim of this study was to examine the differences in mental health indicators among individuals with disabilities, comparing those who participate in sports and exercise with those who do not.

**Methods:** We conducted an Internet-based cross-sectional study in 2024, using a nonprobability (convenience) sample. Participants reported their involvement in sports and exercise and completed scales to assess psychological well-being, life satisfaction, and positive and negative affects.

**Results:** The study included 120 adults with disabilities, with an average age of 43.13 years. The findings indicated that categorised athletes, uncategorised athletes, and recreationally active individuals reported higher life satisfaction ( $F(2,111)=8.60, p < 0.001, \eta_p^2=0.13$ ) and positive affect ( $F(2,104), p=0.001, \eta_p^2=0.12$ ) compared to physically inactive individuals, with categorised athletes reporting the highest levels of life satisfaction. Additionally, while negative affect was consistent across all groups, the results suggested that active uncategorised athletes and recreationally active individuals had higher psychological well-being than those who were physically inactive.

**Conclusion:** The study suggests that active participation in sports and recreational physical activities may play a significant role in enhancing the mental health of individuals with disabilities, potentially leading to greater life satisfaction and positive outcomes among athletes and recreationally active individuals. These findings support public health initiatives and policies that promote physically active lifestyles, which may contribute to improved mental well-being.

**Keywords:** physical activity, mental health, disabled persons, sports, life satisfaction, psychological well-being

## Introduction

Physical activity (PA) is widely recognised for its numerous health benefits, impacting both physical and mental well-being. However, a review of the literature highlights that the relationship between PA and mental health is complex, with findings that remain inconsistent. A review published by the John W. Brick Mental Health Foundation reported that 89% of studies over the past thirty years support the positive role of PA in improving mental health (1). Conversely, some research indicates contrary findings, suggesting that excessive physical activity may result in exercise addiction (2), negative body image and eating disorders (3), mood deterioration (4), and overtraining syndrome, potentially leading to clinical depression (5,6). Moreover, research examining the correlation between PA and diverse measures of psychological well-being has yielded conflicting findings, both within the general population (7-10) and among those with disabilities (11-15). While these contradictory findings may suggest a gap in understanding the effects of physical activity on mental health and overall well-being, they primarily highlight the complexity of different types of physical activity, as well as the varied practices and motivations associated with engaging in physical activity.

Sport represents a structured and organised type of PA, embodying the most formalised expression of such activities. Although it often implies an element of competition, the competitive nature of sports can be difficult to define, as the field of sports encompasses a wide range of activities that extend beyond traditional competitive formats (16). As such, it provides promising research avenues that might yield new insights into the relationship between PA forms and mental health. This holds particularly true for participation in sports and general PA among individuals with disabilities. Some empirical insights indicate a link between sport and numerous aspects of health, especially for individuals with physical and mental impairments (17). Additional data on individuals with disabilities highlight the substantial potential of sports and recreational activities

in enhancing mental health, providing psychosocial support, facilitating adaptation, and accelerating rehabilitation (11, 18, 19).

These insights are of both empirical and theoretical significance, especially given the numerous challenges individuals with disabilities face in participating in active sports and physical recreation. However, research on the participation of individuals with disabilities in sports and physical activity and its relationship with mental health remains limited.

In this study, we examined mental health indicators—specifically psychological well-being, positive and negative affect, and life satisfaction among categorized athletes, active uncategorized athletes and recreationists, and physically inactive individuals with disabilities. Based on various theoretical frameworks, including self-determination theory (20,21), self-efficacy theory (22), and dual-mode theory (23), alongside potential neurobiological systems and mechanisms influenced by PA (24-27), we hypothesised that categorised athletes, active uncategorised athletes, and recreationists would exhibit enhanced psychological well-being, life satisfaction, and positive affect, along with reduced negative affect, in comparison to inactive individuals with disabilities.

## Material and Methods

### *Study Design*

This was a cross-sectional study.

### *Ethics*

This study was part of a broader research project titled “Physical Activity and Psychological Well-being: From Habit to Identity,” which was funded by the Catholic University of Croatia and approved by the Ethics Committee of the Catholic University of Croatia (Document Class: 641-03/22-03/10; No.: 498-15-06-22-005).

The study adhered to the ethical standards established in the 1964 Declaration of Helsinki and its later revisions, as well as the General Regulation on the Protection of Personal Data (EU) 2016/679 (GDPR) and the

Law on the Implementation of the General Regulation on the Protection of Personal Data (NN 42/2018). Participants received information regarding the study's objectives, characteristics, protocol, and data analysis, and they were informed that they consented to participate by proceeding with the online form.

### *Participants*

The target population of this study included individuals with disabilities in Croatia engaged in various levels of sporting activities, as well as physically inactive individuals with disabilities. The study's sample was convenient and consisted of individuals who received an invitation letter from the partner institutions to participate in the research project. Among the participants, 38 were categorised as active athletes within one of the athlete categories in Croatia, 22 were active but uncategorised athletes, 23 were actively engaged in recreational sports and exercise, and 37 reported no involvement in sports or exercise. Due to the small number of participants in the active uncategorised athlete and active recreational groups, as well as their similar levels of involvement in sports, we combined these groups into a single category for analysis (active uncategorised athletes and recreationists).

### *Procedure*

A letter of invitation was composed, highlighting that the study targets all adult individuals with disabilities. It contained detailed information on the study, including its objectives and scientific and practical significance, and a link to the online questionnaire (created using the SurveyRock web platform). The Centre for Professional Rehabilitation in Zagreb invited its users to participate in the project and communicated this invitation to the Croatian Paralympic Committee, who subsequently motivated para-athletes to join the project. In the introductory section of the questionnaire, we emphasised the study's objective and provided participants with information regarding the confidentiality and anonymity of their data. Additionally, we indicated that the data would be assessed solely at the

group level. We highlighted the possibility for participants to withdraw from the study at any point without facing any consequences. At the end of this section, we informed the participants that by continuing (clicking the "next" button), they were giving their consent to take part in the study. The duration required to complete the questionnaire was up to 15 minutes. The research took place from June 6 until the end of June 2024.

In the initial part of the questionnaire, following the identification of disability types, participants indicated whether they are active categorised athletes, uncategorised active athletes, active recreationists (engaged in recreative sports or exercise), or predominantly physically inactive individuals. Upon providing responses on their sports and exercise involvement, participants responded on the scales assessing mental health indicators and general sociodemographic questions.

## **Measures**

### *Psychological well-being*

Psychological well-being was assessed using a shortened version of Ryff's (28,29) psychological well-being scale. This version includes 18 items that assess six dimensions of well-being: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, self-acceptance, and overall psychological well-being. Participants rated statements, for example: "I am good at managing the responsibilities of daily life," using a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree), where a higher score reflects a greater sense of psychological well-being. The sum of all item ratings represents the total score. The overall scale demonstrated good reliability, as indicated by an internal consistency coefficient (Cronbach  $\alpha=0.81$ ).

### *Satisfaction with life*

Life satisfaction was measured utilising the Satisfaction with Life scale (30). The scale consists of five items (e.g. In most ways, my life is close to my ideal) and assesses overall judgment of life satisfaction. On a seven-

point Likert scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”), respondents indicated the extent to which they agree with each item based on their overall perception of life satisfaction. The total score is the sum of all the ratings for each item. The internal consistency (Cronbach  $\alpha=0.88$ ) of the scale suggested high reliability.

### Positive and negative affect

The short form of positive and negative affect in the past week was administered to assess participants’ positive and negative affect schedule (PANAS) scale (31). The short PANAS scale consists of 10 items, with five assessing positive (e.g. enthusiastic) and five assessing negative affect (e.g. upset). Participants indicated to what extent they felt as each item suggests on a scale from 1 (very slightly or not at all) to 5 (extremely). The scores for positive and negative affect were calculated by summing the ratings of five items for each subscale. The reliability (internal consistency) of the positive (Cronbach  $\alpha=0.83$ ) and negative affect (Cronbach  $\alpha=0.88$ ) subscales was highly satisfactory.

### Data analysis

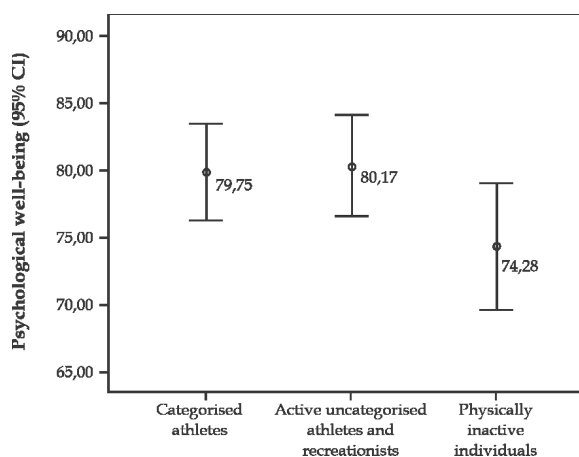
We used one-way ANOVA to examine mean differences in psychological well-being, positive and negative affect, and life satisfaction among active athletes, amateur athletes, active recreationists, and non-active individuals with disabilities. To explore differences between specific groups, we applied the Tukey HSD post hoc test.

### Results

The study sample consisted of 120 adult individuals with disabilities aged an average of 43,13 years (SD=14,65, range 18 - 72).

The analysis of variance indicated that the difference in psychological well-being among the three groups of participants approached statistical significance ( $F(2,109)=2.18$ ,  $p=0.064$ ,  $\eta_p^2=0.05$ ). Post hoc analyses showed that active uncategorised athletes and

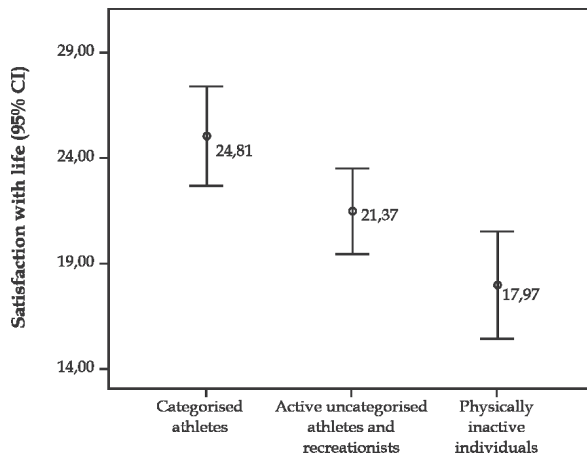
recreationists exhibited greater psychological well-being than physically inactive individuals, with a lower level of statistical significance ( $p=0.064$ ). The psychological well-being of categorised athletes was not statistically significant compared to that of physically inactive individuals ( $p=0.132$ ) or uncategorised athletes and recreationists ( $p=0.976$ ).



**Figure 1.** Psychological well-being of categorised athletes, active uncategorised athletes and recreationists and physically inactive individuals with disabilities

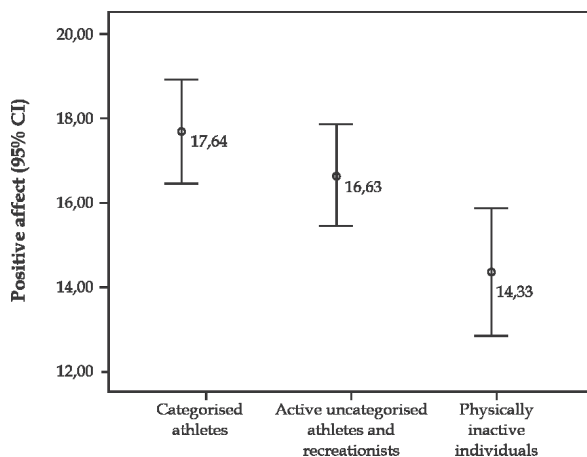
The results, furthermore, demonstrated a difference in life satisfaction among categorised athletes, active uncategorised athletes, recreationists, and physically inactive individuals ( $F(2,111)=8.60$ ,  $p<0.001$ ,  $\eta_p^2=0.13$ ). Post hoc analysis revealed that physically inactive individuals expressed lower satisfaction with life than categorised athletes ( $p<0.001$ ) and also compared to active uncategorised athletes and recreationists, albeit at a lower level of statistical significance ( $p=0.08$ ). Additionally, at a lower level of statistical significance, categorised athletes demonstrated greater life satisfaction than active uncategorised athletes and recreationists ( $p=0.07$ ) (Figure 2).

The results testing the difference in positive affect, showed that the positive affect between categorised athletes, active uncategorised athletes and recreationists, and physically inactive individuals varied significantly ( $F(2,104)$ ,  $p=0.001$ ,  $\eta_p^2=0.12$ ). Post hoc analysis



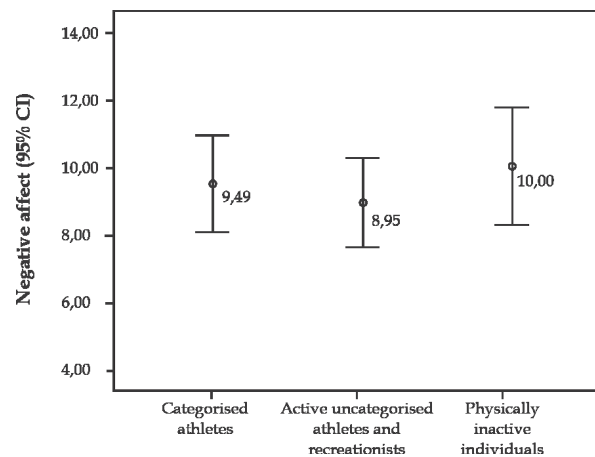
**Figure 2.** Satisfaction with the life of categorised athletes, active uncategoryed athletes and recreationists and physically inactive individuals with disabilities

revealed a lower positive affect in physically inactive individuals relative to categorised athletes ( $p = 0.001$ ) and active uncategoryed athletes and recreationists ( $p=0.016$ ) (Figure 3).



**Figure 3.** Positive affect of categorised athletes, active uncategoryed athletes and recreationists and physically inactive individuals with disabilities

Finally, the results indicated that negative affect did not differ significantly among the three participant groups, suggesting that categorised athletes, active uncategoryed athletes, and recreationists, as well as physically inactive individuals with disabilities, exhibited the same degree of negative affect ( $F(2,109)=0.65$ ,  $p= 0.522$ ,  $\eta_p^2=0.01$ ) (Figure 4).



**Figure 4.** Negative affect of categorised athletes, active uncategoryed athletes and recreationists and physically inactive individuals with disabilities

## Discussion

This study examined differences in mental health indicators between three groups of individuals with disabilities depending on their involvement in sports and exercise. Specifically, we tested whether psychological well-being, life satisfaction, and positive and negative affect differ among categorised athletes, active uncategoryed athletes and recreationists, and physically inactive individuals with disabilities.

The study's results confirmed the hypothesised increased life satisfaction and positive affect of categorised athletes, active uncategoryed athletes, and recreationists compared to physically inactive individuals with disabilities. This finding aligns with empirical evidence indicating that physical activity may positively impact mental health (1). It also supports the theoretical assumption that intrinsic involvement in sports and physical activities can yield enjoyment and satisfaction (32,33), with the potential activation of neurobiological systems through increased physical activity. Specifically, increased PA facilitates the release of monoamine neurotransmitters (i.e., serotonin, dopamine, norepinephrine) (24,25), stimulates the endocannabinoid system (26), and activates brain-derived neurotrophic factor (27), resulting in improved emotional states, enhanced stress regulation, reduced anxiety, and overall well-

being. Furthermore, our study's findings indicate that categorised athletes report higher life satisfaction compared to active uncategorised athletes and recreationists as well. This suggests that structured sports may be the factor that contributes to overall satisfaction by enhancing self-actualization, identity, and self-efficacy (22).

On the other hand, we did not confirm our hypothesis and find higher psychological well-being of categorised athletes compared to physically inactive individuals with disabilities, although results suggested that active uncategorised athletes and recreationists exhibit higher psychological well-being than physically inactive individuals with disabilities. This result might suggest an impact of additional demands inherent in competitive sports, which are absent in non-competitive activities, thereby generating further challenges for active athletes. Nonetheless, it is crucial to acknowledge that our findings indicate an increased likelihood for greater psychological well-being among active athletes in comparison to physically inactive individuals with disabilities. The hypothesis that categorised athletes and active uncategorised athletes and recreationists have a lower negative affect than physically inactive people was also not supported by our data. Although this result may be surprising considering the heightened positive affect observed in active athletes and recreationists, it is crucial to recognise that positive and negative affect represent independent dimensions of emotional experience rather than opposing extremes of a singular continuum (34).

Our findings are consistent with those of Popov et al., who found no significant correlation between weekly physical activity and negative affect (35). However, our data suggest that physically inactive individuals with disabilities may experience slightly higher levels of negative affect, though the effect size is small. This indicates the need for further research with larger sample sizes to better understand this relationship.

Our study offers valuable empirical data on the mental health of individuals with

disabilities who engage in sports and regular physical activity, addressing a research area that currently lacks extensive data.

While our study has notable strengths, such as representing 43% of elite, categorized athletes with disabilities in Croatia (36), several limitations should be addressed in future research. A larger sample size is necessary, with clear distinctions between active amateur athletes at the competitive level and recreational athletes with disabilities. Longitudinal research designs could help clarify long-term impacts and potential causal relationships. Additionally, future studies should consider variables like the distinctions between individuals with congenital and acquired disabilities, as existing research shows inconsistent findings in this area (37-39). Additionally, social factors, including peer interaction, social support, and team cohesion, warrant examination due to their demonstrated correlation with mental health and well-being (15,40). Moreover, our prior research indicated that mindset and belief in the benefits of PA serve as an important mechanism influencing the effects of PA (41,42) and sports involvement (43) on mental health and psychological well-being, thereby suggesting a promising research direction for studies involving individuals with disabilities. These studies, along with the studies that elucidate determinants of sustainable PA (44), are also of immense value for practical implications, both for general public health and for health policies related to people with disabilities.

Identifying the sustainability factors of regular PA and understanding the mechanisms through which PA enhances mental health can provide essential insights for cultivating the knowledge, skills, and tools necessary to effectively harness the benefits of PA for the mental health of individuals with disabilities.

## Conclusion

This study suggests that participation in active sports and recreational physical activities may benefit the mental health of individuals with disabilities, as indicated by increased life satisfaction and positive

affect among categorized athletes, uncategorized athletes, and recreationally active individuals, compared to those who are physically inactive. The evidence from this study, therefore, supports public health initiatives and policies that encourage sports and physical activity engagement among individuals with disabilities. By promoting opportunities for self-actualization and fostering active lifestyles, such initiatives can contribute to enhanced mental health outcomes in this population.

## Declarations

### Acknowledgements

"Physical Activity and Psychological Well-being: From Habit to Identity," a research project financed by the Catholic University of Croatia, encompassed this study.

### Authors' contributions

DG: conceptualisation and study design; DG, LP: data collection; DG, KM: statistical analysis; DG, KM: data interpretation; DG, LP: writing the first draft of the manuscript, DG, KM; revising the manuscript for critical intellectual content, LP: editing the manuscript in line with journal's guidelines. All authors approved the final version of the manuscript.

### Ethics consideration

The Ethics Committee of the Catholic University of Croatia approved the study protocol (Document Class: 641-03/22-03/10; No.: 498-15-06-22-005). Upon receiving all the necessary information regarding the study and anonymity in compliance with the General Data Protection Regulation (GDPR), the participants provided informed consent prior to their participation in the study.

### Funding

The Catholic University of Croatia financed the project "Physical Activity and Psychological Well-being: From Habit to Identity", which included this study.

### Competing interests

The authors have nothing to disclose and no conflict of interest to declare.

### Data sharing statement

The authors confirm that the data can be obtained by contacting the corresponding author.

## References

1. John W. Brick Mental Health Foundation. Move Your Mental Health: A Review of the Scientific Evidence on the Role of Exercise and Physical Activity in Mental Health. 2022. Available from: <https://www.johnwbrickfoundation.org/move-yourmental-health-report/>
2. Freimuth M, Moniz S, Kim SR. Clarifying exercise addiction: differential diagnosis, co-occurring disorders, and phases of addiction. *Int J Environ Res Public Health*. 2011;8(10):4069-81.
3. Rizk M, Mattar L, Kern L, Berthoz S, Duclos J, Viltart O, et al. Physical Activity in Eating Disorders: A Systematic Review. *Nutrients*. 2020;12(1):183.
4. Peluso MA, Guerra de Andrade LH. Physical activity and mental health: the association between exercise and mood. *Clinics (Sao Paulo)*. 2005;60(1):61-70.
5. Bouchard C, Blair SN, Haskell WL. Physical activity and health. Champaign, IL: Human Kinetics; 2012.
6. Hassmen P, Koivula N, Uutela A. Physical exercise and psychological well-being: a population study in Finland. *Prev Med*. 2000;30(1):17-25.
7. Busing K, West C. Determining the relationship between physical fitness, gender, and life satisfaction. *Sage Open*. 2016;6(4):1-10.
8. Eime R, Harvey J, Payne W. Dose-response of women's health-related quality of life (HRQoL) and life satisfaction to physical activity. *J Phys Act Health*. 2014;11(2):330-8.
9. Güven ŞD, Özcan A, Taşğın Ö, Arslan F. The relationship between health college students' physical activity status and life satisfaction. *Int J Acad Res*. 2013;5(4):327-31.
10. Huang H, Humphreys BR. Sports participation and happiness: Evidence from US microdata. *J Econ Psychol*. 2012;33(4):776-93.
11. Bačanac Lj, Milićević-Marinković B, Kasum G, Marinković M. Competitive anxiety, self-confidence and psychological skills in top athletes with and without disabilities: Pilot study. *Facta Univ Phys Educ Sport*. 2014;12(2):59-70.
12. Martin JJ. Multidimensional self-efficacy and affect in wheelchair basketball players. *Adapt Phys Act Q*. 2008;25(4):275-88.
13. Martin Ginis KA, Gee CM, Sinden AR, Tomasone JR, Latimer-Cheung AE. Relationships between sport and exercise participation and subjective well-being among adults with physical disabilities: Is participation quality more important than participation quantity? *Psychol Sport Exerc*. 2024;70:102535.
14. Martin Ginis KA, Jetha A, Mack DE, Hetz S. Physical activity and subjective well-being among people with spinal cord injury: a meta-analysis. *Spinal Cord*. 2010;48(1):65-72.

15. Shapiro DR, Martin JJ. Athletic identity, affect, and peer relations in youth athletes with physical disabilities. *Disabil Health J.* 2010;3(2):79-85.
16. Biddle S, Mutrie N, Gorely T. *Psychology of Physical Activity: Determinants, Well-Being and Interventions.* 3rd ed. Routledge; 2015.
17. Slavković S, Kibeček S, Tamaš D. Značaj sportskih i rekreativnih aktivnosti za osobe sa invaliditetom. *Sport Nauka Praksa.* 2021;11(1):15-24.
18. Hughes RB, Nosek MA, Howland CA, Groff JY, Mullen PD. Health promotion for women with physical disabilities: A pilot study. *Rehabil Psychol.* 2003;48(3):182-8.
19. Marić I, Lovrić F, Franjić D. Utjecaj rekreacijskih aktivnosti na mentalno zdravlje. *Zdravstveni Glasnik.* 2020;6(2):105-14.
20. Deci EL, Ryan RM. *Intrinsic Motivation and Self-Determination in Human Behavior.* Springer; 1985.
21. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol.* 2000;55(1):68-78.
22. Bandura A, Wessels S. *Self-efficacy.* Cambridge: Cambridge University Press; 1997.
23. Ekkekakis P. The study of affective responses to acute exercise: The dual-mode model. In: Stelter R, Roessler KK, editors. *New Approaches to Sport and Exercise Psychology.* Oxford, United Kingdom: Meyer & Meyer Sport; 2005. pp. 119-46.
24. Deslandes A, Moraes H, Ferreira C, Veiga H, Silveira H, Mouta R, et al. Exercise and mental health: Many reasons to move. *Neuropsychobiology.* 2009;59:191-8.
25. Ren J, Xiao H. Exercise for mental well-being: Exploring neurobiological advances and intervention effects in depression. *Life (Basel).* 2023;13:1505.
26. Matei D, Trofin D, Iordan DA, Onu I, Condurache I, Ionite C, et al. The endocannabinoid system and physical exercise. *Int J Mol Sci.* 2023;24:1989.
27. Chen ZY, Jing D, Bath KG, Ieraci A, Khan T, Siao CJ, et al. Genetic variant BDNF (Val66Met) polymorphism alters anxiety-related behavior. *Science.* 2006;314:140-3.
28. Ryff CD. Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J Pers Soc Psychol.* 1989;57(6):1069-81.
29. Ryff CD, Keyes CLM. The structure of psychological well-being revisited. *J Pers Soc Psychol.* 1995;69(4):719-27.
30. Mackinnon A, Jorm AF, Christensen H, Korten AE, Jacomb PA, Rodgers B. A short form of the Positive and Negative Affect Schedule: Evaluation of factorial validity and invariance across demographic variables in a community sample. *Pers Individ Dif.* 1999;27(3):405-16.
31. Diener E. Subjective well-being. *Psychol Bull.* 1984;95(3):542-75.
32. Deci EL, Ryan RM. *Intrinsic Motivation and Self-Determination in Human Behavior.* Springer; 1985.
33. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol.* 2000;55(1):68-78.
34. Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: The PANAS scales. *J Pers Soc Psychol.* 1988;54(6):1063-70.
35. Popov S, Volarov M, Rakočević N. The relationship between physical activity and mental health: Is more always better? *Primenjena Psihologija.* 2023;16(3):349-74.
36. *Zakon o Registru osoba s invaliditetom.* Narodne novine. 2022;(63).
37. Campbell E. Psychological well-being of participants in wheelchair sports: comparison of individuals with congenital and acquired disabilities. *Percept Mot Skills.* 1995;81:563-8.
38. Puce L, Biz C, Cerchiaro M, Scapinello D, Giarrizzo L, Trompetto C, et al. Young para-athletes display more hedonic well-being than people with disabilities not taking part in competitive sports: Insights from a multi-country survey. *Front Psychol.* 2023;14:1176595.
39. Puce L, Marinelli L, Girtler NG, Pallecchi I, Mori L, Simonini M, Trompetto C. Self-perceived psychophysical well-being of young competitive swimmers with physical or intellectual impairment. *Percept Mot Skills.* 2019;126(5):862-85.
40. Tough H, Siegrist J, Fekete C. Social relationships, mental health and well-being in physical disability: a systematic review. *BMC Public Health.* 2017;17(1):414.
41. Glavaš D, Pavela Banai I. Physical activity and mental health of employed adults: Mediation and moderation effects of beliefs in the benefits of physical activity. *Int J Environ Res Public Health.* 2024;21(7):854.
42. Glavaš D, Užarević K, Šakić Velić M. Physical activity and resilience – The role of self-perception of physical activity. In: 2nd International Scientific Congress of Student, Physical Exercises and Health, 4 Healthy Academic Society. 2024. pp. 198-204.
43. Glavaš D, Pandžić M, Grubor P. The power of mindset and its role in the psychological well-being of student-athletes, student-exercisers, and non-active students. In: International Scientific Congress of Student Sport, Physical Exercises and Health. 4 Healthy Academic Society. 2023. pp. 35-42.
44. Glavaš D, Čudina V, Domijan D. Self-efficacy and habit as the mechanisms underlying physical activity: a cross-sectional study. *Unicath J Biomed Bioeth.* 2024;1(1):11-8.