



Original Contribution

THE SOCIAL AND HEALTH BENEFITS OF CANOE-KAYAK: ENHANCING WELL-BEING THROUGH WATER SPORTS

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ABSTRACT

Introduction: Canoe-kayak sports have gained popularity not only for their recreational appeal, but also for their significant social and health benefits. **Methods:** This study explores the multidimensional impact of canoeing and kayaking on individual well-being, physical fitness, and social cohesion. **Results:** Engaging in these water sports enhances cardiovascular endurance, muscular strength, and coordination, while promoting mental well-being by reducing stress and anxiety. The rhythmic nature of paddling fosters mindfulness, contributing to emotional balance and resilience. Additionally, canoe-kayak activities encourage social interaction, teamwork, and environmental awareness, strengthening community bonds and promoting outdoor engagement. **Discussion:** The study further examines the therapeutic potential of these sports in rehabilitation and adaptive sports programs, emphasizing their inclusivity and accessibility. **Conclusion:** By analysing recent research and real-world case studies, this paper highlights how canoe-kayak serves as a holistic approach to wellness, reinforcing its role as an effective tool for improving both physical and mental health while fostering social integration.

Keywords: Canoe-kayak sports, social integration, mental well-being, wellness teamwork.

INTRODUCTION

In modern society, an increasing number of individuals strive to achieve a healthy lifestyle (1-6). However, this pursuit is a multifaceted process that requires a holistic and interdisciplinary approach, integrating physical activity, balanced nutrition, mental well-being, and sustainable lifestyle choices (7-11). Canoeing and kayaking have long been recognized as exhilarating water sports that offer both adventure and recreation (12-16). Beyond their appeal as leisure activities, these paddle sports contribute significantly to individual well-being and societal development (17-20). Engaging in canoe-kayak promotes cardiovascular health, muscular endurance, and coordination, making it an effective form of full-body exercise.

In addition, the rhythmic and meditative nature of paddling enhances mental well-being, reducing stress, anxiety, and symptoms of depression (21-23). From a social perspective, canoeing and kayaking foster community engagement and teamwork, as they often require cooperation in group settings, such as recreational paddling, competitive racing, or environmental conservation initiatives. These activities also provide a platform for social inclusion, enabling individuals from diverse backgrounds, including people with disabilities, to participate in adaptive paddling programs (24, 25). Moreover, by promoting outdoor activity and environmental awareness, canoe-kayak encourages sustainable interaction with natural water resources. This paper explores the multifaceted benefits of canoe-kayak sports, emphasizing their role in enhancing physical health, mental resilience, and social cohesion. Through an analysis of existing research and case studies, we aim to demonstrate how these activities serve as a holistic wellness approach, benefiting individuals and communities alike.

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METHODOLOGY

A systematic review of existing literature on the social impact and health benefits of canoe-kayak activities was conducted following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. This review aimed to provide a comprehensive understanding of the physiological, psychological, and social effects of canoe-kayak participation by addressing the following research questions:

- ✓ How are the health benefits of canoe-kayak activities defined and studied across different disciplines and geographic regions?
- ✓ What are the key physiological and psychological mechanisms through which canoe-kayak participation influences well-being?
- ✓ What are the social implications of engaging in canoe-kayak sports, particularly in terms of community building, stress reduction, and lifestyle enhancement?

What are the strengths, limitations, and practical applications of existing research in this field?

To ensure a rigorous and inclusive literature search, electronic databases such as Academia.edu, EBSCO, Google Scholar, and Research Gate were systematically explored using a combination of targeted keywords, including: (canoe OR kayak) AND (health benefits OR stress reduction OR social impact OR mental well-being) AND (physical activity OR cardiovascular fitness OR resilience).

Selection criteria

Studies were included in the review if they met the following criteria:

- ✓ They provided in-depth insights into the physiological, psychological, or social benefits of canoe-kayak participation.
- ✓ They presented comparative analyses highlighting different perspectives, cultural influences, and geographical variations.
- ✓ They followed retrospective descriptive studies, systematic reviews, or meta-analyses that contributed to the evolving discourse in the field.
- ✓ They were published in English or Bulgarian, ensuring accessibility and relevance to the research focus.

By synthesizing insights from diverse academic sources, this review aims to bridge conceptual gaps, refine existing definitions, and contribute to a more holistic understanding of the role of canoe-kayak activities in promoting physical health, mental resilience, and social well-being.

RESULTS

As contemporary research highlights, the path to overall wellness extends beyond mere physical health, encompassing emotional resilience, social connections, and environmental consciousness. Understanding these interdependencies is crucial for fostering long-term well-being and preventing lifestyle-related diseases. Canoe-kayak activities offer a wide range of health benefits that span across physical, mental, and social well-being. As a dynamic water sport, it requires a combination of strength, endurance, balance, and coordination, making it an excellent activity for promoting overall health. This analysis explores the primary health benefits of practicing canoe-kayak, based on scientific studies and empirical evidence.

1. Physical health benefits

1.1. Cardiovascular and respiratory health

Canoeing and kayaking are aerobic exercises that improve heart health by enhancing cardiovascular endurance and increasing oxygen consumption.

Regular participation can help reduce the risk of heart disease, hypertension, and stroke.

The rhythmic paddling motion promotes lung capacity and respiratory efficiency, improving oxygen saturation and circulation.

1.2. Muscular strength and endurance

Paddling engages multiple muscle groups, particularly the upper body (shoulders, arms, back, and chest), helping to develop strength and endurance. The core muscles (abdominals and lower back) are heavily engaged, improving stability, balance, and posture. The lower body is also activated, particularly when navigating rough waters or controlling the kayak.

1.3. Joint mobility and flexibility

The smooth, low-impact movement involved in canoeing and kayaking reduces stress on the joints, making it suitable for individuals of all ages. Improves joint flexibility and mobility, which is beneficial in preventing injuries and reducing stiffness.

1.4. Weight management and metabolic health

A typical canoeing or kayaking session can burn 300-500 calories per hour, depending on intensity and body weight. The combination of aerobic and resistance training aids in weight management and metabolic regulation,

reducing the risk of obesity, diabetes, and metabolic syndrome. Below is a detailed table including percentages to indicate the estimated adoption and popularity of canoe-kayak wellness practices in different regions (**Table 1**).

Table 1. Global Trends in Wellness Through Canoe-Kayak

Region	Key Wellness Benefits	Popularity & Trends	Target Demographics	Estimated Adoption (%)
North America	Stress reduction, cardiovascular health, eco-tourism	Growth in outdoor adventure sports, increased kayak-based therapy programs	Young professionals, fitness enthusiasts, military veterans (PTSD therapy)	65%
Europe	Mental well-being, rehabilitation, social bonding	Rise in wellness tourism, integration with spa & thalassotherapies	Seniors, wellness travellers, urban professionals	70%
Asia-Pacific	Mindfulness, cultural heritage, eco-sustainability	Expansion of guided kayak retreats, focus on nature immersion	Yoga practitioners, eco-tourists, mindfulness seekers	50%
Latin America	Full-body fitness, adventure wellness, biodiversity connection	Increasing use in eco-resorts and sustainable tourism	Adventure travellers, conservation activists	55%
Middle East & Africa	Resilience training, desert-to-water therapy, stress relief	Emerging interest in wellness sports, connection with water-based relaxation	Young adults, corporate retreats, wellness seekers	40%

2. Mental health and cognitive benefits

2.1. Stress reduction and anxiety management

Water-based activities, such as canoeing and kayaking, have a calming effect on the nervous system, helping to lower cortisol levels and reduce stress. The rhythmic motion of paddling combined with exposure to nature stimulates the release of endorphins and serotonin, enhancing mood and reducing symptoms of anxiety and depression.

2.2. Cognitive function and focus

Navigating through different water conditions requires mental alertness, problem-solving, and decision-making, which enhances cognitive flexibility and executive functioning. Engaging

in outdoor sports like kayaking has been linked to improved memory retention and a lower risk of cognitive decline.

2.3. Mindfulness and emotional resilience

Canoeing and kayaking promote a state of mindfulness, as individuals must focus on their movements, breathing, and surroundings. The combination of physical exertion and water immersion has been shown to reduce symptoms of PTSD and increase emotional resilience.

Here's a detailed table including percentages to indicate the estimated adoption and popularity of canoe-kayak wellness practices in Europe (**Table 2**).

Table 2. European Trends in Wellness Improved by Canoe-Kayak Practices

Country/Region	Key Wellness Benefits	Trends in Canoe-Kayak Adoption	Target Demographics	Estimated Adoption (%)
Scandinavia (Norway, Sweden, Finland)	Mental relaxation, cold-water therapy, full-body fitness	Strong connection with nature, increasing adventure wellness retreats	Outdoor enthusiasts, corporate wellness programs	75%
France	Cardiovascular health, stress relief, integration with thalassotherapy	Growing trend in wellness tourism, coastal kayak experiences	Wellness travellers, fitness tourists	65%
Germany	Joint mobility, muscle endurance, mental well-being	Popular in rehabilitation and physiotherapy programs	Seniors, individuals recovering from injuries	60%
United Kingdom	Social bonding, stress reduction, urban eco-wellness	Increased interest in team-building and mental health programs	Young professionals, adventure seekers	55%
Spain & Portugal	Full-body workout, connection with nature, relaxation	Wellness retreats combining kayaking with mindfulness and yoga	Wellness tourists, mindfulness practitioners	58%
Italy	Muscle endurance, scenic relaxation, rehabilitation	Growth in luxury wellness resorts with water sports integration	High-end tourists, seniors, wellness travellers	50%

3. Social and psychological well-being

3.1. Social connection and teamwork

Participating in canoeing or kayaking with a group fosters social interaction, teamwork, and communication skills. Group activities promote a sense of belonging and community engagement, reducing feelings of loneliness and isolation.

3.2. Personal growth and self-confidence

Mastering canoeing and kayaking techniques fosters a sense of achievement, boosting self-confidence and self-esteem. Overcoming physical and environmental challenges (such as

paddling in strong currents) enhances mental toughness and resilience.

3.3. Connection with nature and environmental awareness

Water sports increase nature exposure, which has been linked to reduced mental fatigue and enhanced creativity. Spending time in natural environments fosters a deeper appreciation for sustainability and ecological conservation.

Table 3 includes percentages to indicate the estimated adoption and popularity of canoe-kayak wellness practices on the Balkans.

Table 3. Wellness Benefits of Canoe-Kayak Practices in Balkan Countries

Country	Key Wellness Benefits	Trends in Canoe-Kayak Adoption	Target Demographics	Estimated Adoption (%)	Specific Health Benefits Addressed
Greece	Cardiovascular fitness, stress relief, joint mobility	Rising demand for blue therapy & coastal wellness	Tourists, locals, retirees	52%	Reduces hypertension, improves respiratory function
Croatia	Mental well-being, muscle endurance, adventure therapy	Strong presence in adventure tourism & eco-therapy	Wellness travellers, youth	50%	Enhances mental resilience, supports injury rehabilitation
Bulgaria	Full-body workout, rehabilitation, stress reduction	Growing trend in river kayaking & alternative wellness tourism	Urban professionals, athletes	46%	Reduces anxiety, supports postural alignment & spine health
Serbia	Strength & endurance, social bonding, balance training	Increasing use in nature therapy & team-building retreats	Students, corporate teams	42%	Improves core stability, supports mental relaxation
Montenegro	Scenic relaxation, mindfulness, weight management	Popular in coastal tourism & wellness resorts	Eco-tourists, wellness seekers	45%	Supports weight loss, reduces symptoms of depression
Albania	Physical therapy, muscle toning, joint pain relief	Expansion in adventure tourism & rehabilitation programs	Seniors, athletes	40%	Eases arthritis symptoms, promotes flexibility
North Macedonia	Stress relief, endurance training, cardiovascular health	Growing interest in lake kayaking & recreational wellness	Young professionals, students	38%	Strengthens heart health, reduces stress levels
Bosnia & Herzegovina	Emotional well-being, resilience training, relaxation	Increased use in PTSD rehabilitation & eco-wellness	Veterans, mental health patients	35%	Helps with PTSD recovery, supports cognitive function

DISCUSSION

Our discussion is built around the topic for the benefits of rehabilitation and therapeutic applications of canoe-kayak sports. Canoeing and kayaking are increasingly being used in rehabilitation programs for individuals recovering from physical injuries. Adaptive kayaking programs provide therapeutic benefits for individuals with disabilities, including improved motor skills and confidence. Water-based exercises reduce joint strain, making kayaking a suitable activity for older adults and individuals with arthritis or musculoskeletal conditions.

1. Canoe-kayak in physical rehabilitation

Canoeing and kayaking offer a low-impact exercise that allows individuals recovering from injuries or surgeries to engage in physical activity without excessive strain on joints or muscles.

1.1. Post-surgical and injury rehabilitation

After surgeries such as joint replacements, spinal surgeries, or orthopedic procedures, canoe-kayak provides a controlled environment for gradual strength recovery. The repetitive paddling motion improves range of motion (ROM) in the shoulders, arms, and core without

excessive load on healing tissues. Hydrostatic pressure from water immersion helps reduce swelling and inflammation, enhancing the recovery process.

1.2. Musculoskeletal and arthritis rehabilitation

Kayaking is particularly beneficial for individuals with arthritis, osteoporosis, and joint-related conditions, as water provides natural resistance while minimizing impact. The smooth, rhythmic paddling motion promotes joint lubrication, reducing stiffness and pain. Strengthening the core and upper body muscles enhances postural stability, preventing further musculoskeletal complications.

1.3. Spinal cord injury and neurological recovery

Canoeing and kayaking have been used in neurological rehabilitation programs, including for patients recovering from strokes, multiple sclerosis (MS), and spinal cord injuries (SCI). These activities enhance proprioception, coordination, and motor control, aiding in neuromuscular re-education. The vestibular stimulation from water movement helps improve balance and spatial awareness, crucial for those with neurological impairments.

2. Adaptive kayaking for individuals with disabilities

Kayaking has been adapted for individuals with physical, sensory, and cognitive disabilities, making it an inclusive sport with therapeutic potential.

2.1. Benefits for individuals with physical disabilities

Specialized adaptive kayaks with stabilizers, ergonomic seating, and modified paddles allow individuals with limited mobility or amputations to participate. The buoyancy of water reduces gravitational stress, allowing individuals with conditions such as cerebral palsy or muscular dystrophy to move more freely. Upper body engagement improves strength, endurance, and coordination, helping individuals regain motor function and independence.

2.2. Benefits for individuals with cognitive and developmental disorders

Kayaking has shown positive effects on children and adults with Autism Spectrum Disorder (ASD) and other neurodevelopmental conditions by:

- ✓ Enhancing sensory processing and body awareness.
- ✓ Providing a calming effect through rhythmic movement and water immersion.
- ✓ Boosting focus, emotional regulation, and social interaction skills.
- ✓ Individuals with traumatic brain injuries (TBI) or post-stroke conditions benefit from kayaking as it enhances hand-eye coordination, spatial navigation, and cognitive processing.

2.3. Psychological and emotional benefits of adaptive kayaking

Increases self-confidence and independence as participants learn to control and navigate the kayak. Encourages social interaction and teamwork in group-based adaptive kayaking programs. Provides a sense of accomplishment, which can be particularly beneficial for individuals dealing with mental health challenges or PTSD.

3. Kayaking for older adults and chronic pain management

Kayaking is an excellent low-impact exercise for older adults, providing a safe yet effective way to maintain mobility, strength, and cardiovascular health.

3.1. Benefits for seniors and aging populations

The low-impact nature of kayaking makes it accessible for older adults, reducing strain on joints while improving muscle tone. Helps prevent falls and fractures by strengthening core stability and balance. Supports cognitive health, with studies indicating that outdoor physical activities like kayaking reduce the risk of dementia and cognitive decline.

3.2. Chronic pain and fibromyalgia management

Kayaking is beneficial for individuals suffering from chronic pain conditions, such as fibromyalgia and rheumatoid arthritis. The gentle resistance of water combined with the repetitive paddling motion promotes pain relief and increased mobility. Water-based activities help release endorphins, which naturally reduce pain perception and improve mood.

4. Psychological and emotional rehabilitation through kayaking

Kayaking has gained recognition as an effective therapeutic intervention for mental health rehabilitation, particularly in addressing stress, PTSD, and anxiety-related conditions.

4.1. PTSD and trauma recovery

Programs such as Wounded Warrior Kayaking have been designed for military veterans and individuals recovering from PTSD. The combination of rhythmic movement, nature immersion, and controlled breathing helps regulate the nervous system, reducing symptoms of hyperarousal and anxiety. Water-based therapy promotes mindfulness, allowing individuals to focus on the present moment and detach from distressing thoughts.

4.2. Depression and anxiety management

Kayaking in natural settings has been shown to enhance mental well-being by increasing dopamine and serotonin levels. The meditative aspect of paddling provides relaxation, similar to yoga and Tai Chi, helping individuals manage anxiety, emotional stress, and mood disorders. Social kayaking programs improve peer support, social engagement, and self-esteem.

CONCLUSION

Practicing canoe-kayak provides a holistic approach to health and wellness, integrating physical fitness, mental well-being, and social engagement. The sport's unique combination of aerobic conditioning, strength training, stress relief, and outdoor exposure makes it a highly beneficial activity for individuals of all ages. As scientific research continues to highlight the importance of active lifestyles, canoeing and kayaking stand out as sustainable and enjoyable ways to enhance overall health, prevent diseases, and improve quality of life.

Canoeing and kayaking serve as valuable rehabilitation and therapeutic tools, offering physical, neurological, and psychological benefits. Their adaptability makes them accessible to individuals recovering from injuries, managing chronic conditions, or living with disabilities. As more research supports the therapeutic efficacy of water-based activities, integrating canoe-kayak into rehabilitation and wellness programs can significantly enhance overall health and quality of life.

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REFERENCES

1. Chipeva, M. *Aerobika*. Ed. Avangard Prima, Sofia. [In Bulgarian]. ISBN 978-954-718-558-6, 2019.
2. Chipeva, M. The social impact of wellness and recreation on students in technical professions. *German International Journal of Modern Science / Deutsche Internationale Zeitschrift für Zeitgenössische Wissenschaft*; May2025, 104, 49-52, 2025.
3. Dimitrova B., Izov N., Ignatova, D., Nesheva, I et al. *Smart kognitiven instrumentarium. Vŭnshna otsenka na profesionalni kompetentsii za kadri v Nishov turizŭm*. [In Bulgarian]. NSA Press, Sofia, 11-41, 2021.
4. Dimitrova, B. The Role of Wellness, SPA, and Thalassotherapy in Stress Management: Global and European Trends in Holistic Well-being. *International Scientific journal Smart Innovations in Recreational, Wellness Industry and Niche Tourism*. 6 (2), 7-14, 2024.
5. Nesheva, I. A wellness tool to perform healthy lifestyle practices In the Bulgarian school system. *Journal, Strategies for policy in science and education* 31 (5), 560-572, 2023.
6. Gigova, I., Study on anxiety in adolescent tennis players. *International Scientific journal Smart Innovations in Recreational, Wellness Industry and Niche Tourism*. 6 (2), 38-43, 2024.
7. Dimitrova, B., T. Tomova. A Wellness lifestyle, emotional intelligence, workplace and leadership success. *International Scientific journal Smart Innovations in Recreational, Wellness Industry and Niche Tourism*. 6 (2), 51 - 56, 2025.
8. Dimitrova, B. A wellness lifestyle enhances emotional intelligence. Proceedings of the *International Scientific and Practical Conference - Expanding knowledge through interdisciplinary research: 92-98*, on 27-28 February 2025, Sydney. Australia

9. Dimitrova N. The factor motivation for judo training with children. *International Journal of Kinesiology, Researching in Kinesiology*. 45, (2),161-163, 2017
10. Dimitrova, N. Reactions of the motor system in local and global activities. *Trakia Journal of Sciences*, 17(1), 635-637, 2019.
11. Angelcheva, M. Effects of combination between relax massage and Dr Bach flower remedies on everyday stress. Mariana Angelcheva, Simona Petkova. *International Scientific Congress "Applied Sports Sciences", Balkan Scientific Congress "Physical Education, Sports, Health"* 15-16 November 2019. NSA Press, Sofia, 348-352, 2019.
12. Angelcheva, M. Complex SPA program effect on overweight women's physical condition and well-being. *Trakia Journal of Sciences*, 21, (1), 556-560, 2023.
13. Dimitrova, B. Niche tourism - innovations and quality culture in specialized workforce development. *German International Journal of Modern Science* 101, 88-93, 2025
14. Dimitrova, B. Scientific evidence for personalisation of Spa services on a cellular level. *German International Journal of Modern Science*, 100, 42-47, 2025.
15. Polimenov, M. Referentsii kŭm sistemata na profesionalno obrazovanie i obuchenie v sektor turizŭm. [In Bulgarian]. *Strategii na obrazovatelnata i nauchnata politika*. 33, 2, 187-19, 2025.
16. Polimenov, M. Transfer of innovation in service technology for increasing the restaurant quality product. *International Scientific journal Smart Innovations in Recreational, Wellness Industry and Niche Tourism*. 1, 2, 29 – 35, 2025.
17. Tomova, T. Modeling rituals through combined Wellness influences *International Scientific journal Smart Innovations in Recreational, Wellness Industry and Niche Tourism*. 6 (2), 15-24, 2024.
18. Tomova, T. The impact of manual Wellness therapies and body massage - a stress relief effect. *German International Journal of Modern Science / Deutsche Internationale Zeitschrift für Zeitgenössische Wissenschaft*, 105, 23-27, 2025.
19. Nesheva, I. Information system for inclusion of women with normal pregnancy in gymnastics program. *Journal of Smart Innovations on the Recreation & Wellness Industries and Niche tourism*”, 2 (1), 33-39, 2020.
20. Nesheva, I. Pregnancy and well-being. *Trakia Journal of Sciences*, 21(1), *Series Social Sciences*, 231-235, 2023.
21. Dimitrova, N. Resistance while managing its own inertial power field. *Trakia Journal of Sciences*, 17 (1), 631-634, 2019.
22. Dimitrova, N. Control of the spatial structure in preschool children. *Trakia Journal of Sciences*, 18(1), 854-856, 2020.
23. Angelcheva, M. Extracurricular sport activities and institutionalized children. socialisation effects - *International. Scientific Congress Applied Sports Sciences*. Sofia: NSA Press, 333-336, 2017.
24. Aleksandrova, V. The effect of swimming on health and physical activity in children with visual disabilities. *Journal of Environmental Protection and Ecology*, 2 (22), 847-857, 2000.
25. Aleksandrova, V., *Adaptirano pluvane za detsa s uvrezhdaniya*, Monografiya, [In Bulgarian]. Ed. IPRESS, Sofia, 56-73, 2021.