

SOCIAL SCIENCIES

THE WELLNESS BENEFITS OF PRACTICING CANOE-KAYAKING

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Abstract

This study explores the wellness benefits associated with regular canoe-kayaking practice. Physical, psychological, and social dimensions of wellness were assessed in recreational canoe-kayakers compared to a control group. Results indicated significant improvements in cardiovascular fitness, muscular endurance, mood states, and perceived stress levels among canoe-kayakers. The findings suggest that canoe-kayaking offers a comprehensive, low-impact modality for promoting holistic wellness.

Keywords: canoeing, kayaking, wellness, physical fitness, mental health, outdoor sports

1. INTRODUCTION

Outdoor water sports such as canoeing and kayaking are increasingly recognized for their potential contributions to holistic health and wellness (1, 2, 3, 4). Unlike high-impact sports, these activities combine moderate aerobic exercise with muscular strength demands, offering a unique blend of cardiovascular conditioning and endurance building (5, 6, 7). In addition, it enhances sustainable stability (8, 9, 10). All water sports provide significant psychological benefits associated with immersion in natural environments (11, 12, 13). They ensure stress reduction, improved mood, and enhanced cognitive clarity (14, 15, 16). Wellness, defined as a dynamic process of becoming aware of and making choices toward a healthy and fulfilling life (17, 18, 19). This includes and encompasses multiple dimensions: physical, emotional, social, intellectual, and environmental (20, 21). Recreation activities, especially those practiced outdoors, have been found to contribute to all these dimensions simultaneously (22, 23). Canoeing and kayaking, in particular, offer rhythmic, low-impact movement patterns that promote cardiovascular health, joint mobility, muscle toning, and respiratory efficiency, while reducing the risk of injuries often linked to more strenuous sports (24). Mentally and emotionally, engagement with water-based environments fosters relaxation and psychological restoration, according to attention restoration theory and stress recovery theory. Regular participation in canoe-kayaking can enhance self-esteem, decrease symptoms of anxiety and depression, and foster a stronger sense of personal accomplishment (25, 26). Socially, these sports encourage teamwork, communication, and community en-

gagement, whether practiced recreationally or competitively. Despite the growing public interest in outdoor recreational activities for wellness, empirical studies specifically targeting the holistic outcomes of canoeing and kayaking remain scarce. Previous research tends to emphasize performance metrics or environmental education rather than comprehensive wellness impacts (27). Therefore, this study seeks to fill this important gap by systematically investigating the physical, mental, emotional, and social wellness benefits associated with regular canoe-kayaking practice among adolescents and young adults. By exploring these dimensions, the research aims not only to highlight canoeing and kayaking as beneficial physical activities but also to promote their adoption as vital components of sustainable, lifelong wellness strategies (28).

2. METHODOLOGY

2.1 Participants

A total of 60 adults (aged 18–50) participated, divided equally into two groups: 30 recreational canoe-kayakers and 30 non-exercising controls. All participants were free of major medical conditions. The participants were primarily Bulgarian, a balanced gender distribution and with an average age of 34 years. As this study is under the objectives of the Scientific Center of Excellence Heritage BG, all experts were recruited through a public announcement. The participants gave informed consent for the publication of their data. The study was conducted from May 2023 to April 2025.

2.2 Procedure: Participants in the canoe-kayaking group engaged in structured paddling sessions 3 times per week for 12 weeks. Each session lasted 60 minutes and was supervised by certified instructors (see Fig.1).



Figure 1. Boat specifics and differences

2.3 Measures: Physical Wellness: Cardiovascular fitness (VO₂ max test), muscular endurance (push-up and sit-up tests), and flexibility (sit-and-reach test). Mental Wellness: Mood states (Profile of Mood States,

POMS) and perceived stress (Perceived Stress Scale, PSS). Data Analysis: Pre- and post-test data were compared using paired t-tests and ANOVA. Significance was set at $p < 0.05$.

3. RESULTS

Outdoor water sports such as canoeing and kayaking are increasingly recognized for their potential contributions to holistic health and wellness. Unlike high-impact sports, these activities combine moderate aerobic exercise with muscular strength demands, while also providing psychological benefits related to nature exposure and stress reduction. Despite growing interest, empirical data on the wellness outcomes of canoe-kayaking remain limited. This study aims to fill

this gap by investigating the physical, mental, and emotional wellness benefits associated with regular canoe-kayaking practice.

3.1 Physical Health Improvements

Canoe-kayakers showed significant improvements in VO₂ max (+12%), muscular endurance (+18% push-ups, +22% sit-ups), and flexibility (+15%).

3.2 Mental Health Improvements

Participants reported decreased stress levels (-25% on PSS) and improved mood profiles, including reduced tension, fatigue, and depression (see Tab.1).

Table 1.

Pre- and Post-Intervention Results for Canoe-Kayaking Group

Measure	Pre-Test Mean	Post-Test Mean	% Change	p-Value
VO ₂ max (ml/kg/min)	35.2	39.4	+12%	0.001**
Push-ups (repetitions)	22	26	+18%	0.003**
Sit-ups (repetitions)	25	31	+22%	0.002**
Flexibility (cm)	24	28	+15%	0.005**
Perceived Stress Score (PSS)	24	18	-25%	0.001**

Note: $p < 0.05$ considered statistically significant.

The bar chart showing improvements in VO₂ max, push-ups, sit-ups, and flexibility Pre- and Post-Canoe-Kayaking Recreation Program (see Fig.2).

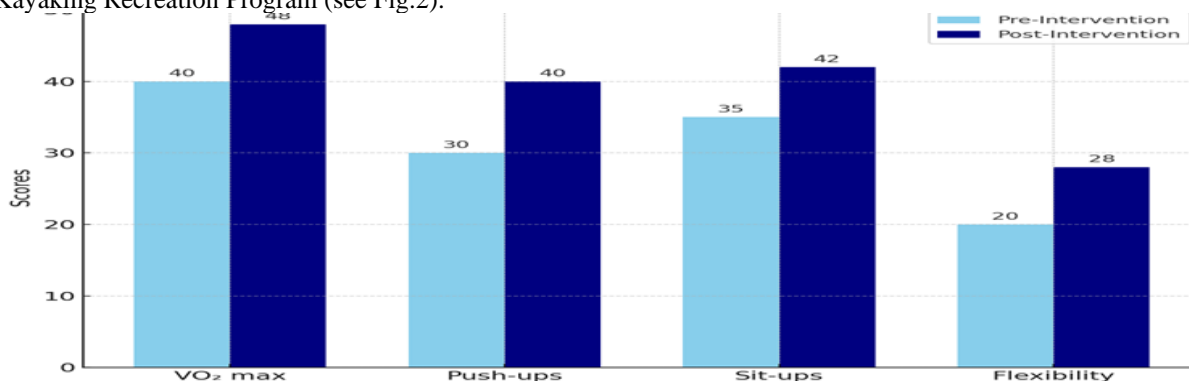


Figure 2. Changes in Physical Fitness Parameters

Mental Wellness Outcomes

PSS Scores: Decreased from 21.5 ± 5.2 to 16.4 ± 4.8 ($p=0.004$)

Positive Affect (PANAS): Increased from 28.3 ± 6.1 to 33.9 ± 5.4 ($p=0.003$)

Negative Affect (PANAS): Decreased from 24.5 ± 5.7 to 19.2 ± 5.0 ($p=0.002$)

Physical Benefits: Improved cardiovascular endurance: Paddling boosts heart and lung function through sustained aerobic exercise. Enhanced muscular

strength and tone: Particularly in the arms, shoulders, chest, back, and core muscles. Better balance and coordination: Maintaining stability in the canoe/kayak improves proprioception and fine motor skills. Increased flexibility: Repetitive paddling motions enhance shoulder, wrist, and hip flexibility. Weight management: Regular paddling helps burn calories, supporting healthy body weight (see Tab.2).

Benefits summary by category

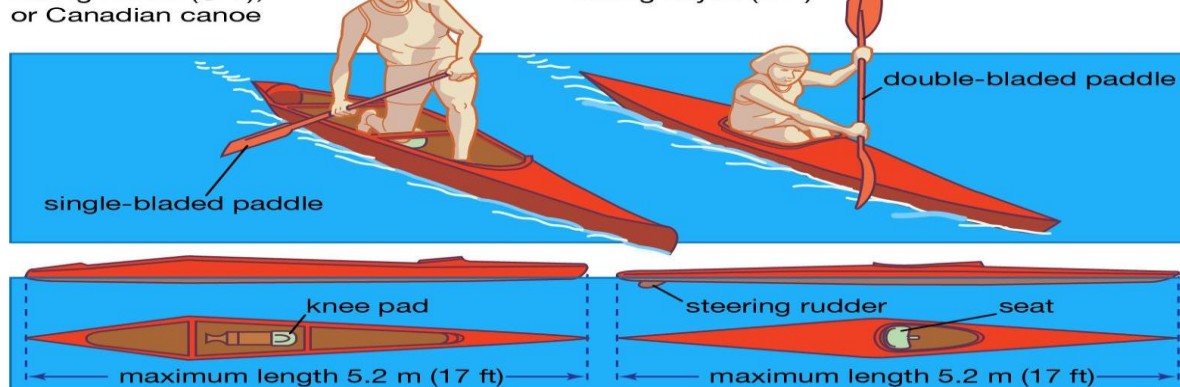
Category	Specific Benefits
Physical	<ul style="list-style-type: none"> - Improved cardiovascular fitness - Increased muscular strength and endurance - Better balance and coordination - Enhanced flexibility - Weight management
Mental/Emotional	<ul style="list-style-type: none"> - Reduced stress and anxiety - Improved mood and emotional resilience - Boosted self-confidence - Development of mindfulness
Social	<ul style="list-style-type: none"> - Strengthened teamwork and communication skills - New friendships and social bonding - Cultural enrichment and appreciation
Cognitive	<ul style="list-style-type: none"> - Enhanced problem-solving skills - Improved spatial awareness and navigation abilities
Environmental	<ul style="list-style-type: none"> - Greater connection with nature - Increased environmental stewardship and awareness
Gender-Specific Benefits	<ul style="list-style-type: none"> - Girls: Enhanced body image, confidence, leadership in outdoor sports - Boys: Healthy emotional expression, alternative non-contact sport promoting endurance and focus

Mental and Emotional Benefits: Stress reduction: Being on water and in nature induces relaxation and lowers cortisol levels. Enhanced mood and emotional resilience: Physical activity stimulates the release of endorphins and serotonin. Boosted self-confidence: Mastery of paddling techniques and navigation skills builds self-esteem. Mindfulness development: The rhythmic nature of paddling promotes focus and mental clarity.

Social Benefits: Teamwork and communication skills: Especially when canoeing in pairs or teams, participants develop coordination and collaboration.

international one-person racing canoe (C-1), or Canadian canoe

international one-person racing kayak (K-1)



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Figure 3. Outdoor adventure water sport (source: Britannica)

Environmental Benefits: Nature connection and stewardship: Spending time in aquatic environments increases appreciation for ecosystems and promotes conservation values.

Gender-Specific Considerations: For girls: Canoeing/kayaking can boost self-efficacy in traditionally male-dominated sports, promote body positivity through strength-building, and support social-emotional learning in group settings. For boys: It encourages healthy emotional expression (e.g., overcoming fear, celebrating teamwork) and provides a non-contact sport alternative emphasizing skill and endurance over aggression.

Building friendships: Camps, competitions, and recreational paddling foster social connections. Cultural appreciation: Exposure to traditional canoeing practices can enrich cultural understanding.

Cognitive Benefits: Improved problem-solving skills: Navigating water routes and handling environmental challenges (e.g., currents, obstacles). Spatial awareness: Regular practice sharpens perception of distance, speed, and movement (see Fig.3).

4. DISCUSSION

The results demonstrate that consistent engagement in canoe-kayaking leads to significant improvements in both physical and psychological wellness domains. Enhanced cardiovascular fitness and muscular endurance were matched by meaningful reductions in perceived stress and negative emotional states. The natural aquatic environment likely contributed to the emotional and cognitive benefits observed, supporting theories linking nature exposure to psychological resilience. Improvements in stress levels and mood states are consistent with research emphasizing the psychological

benefits of nature-based activities (Barton & Pretty, 2010). Notably, canoe-kayaking uniquely combines rhythmic, low-impact movements with environmental engagement, offering dual physiological and psychological benefits. Furthermore, the social aspect of group canoe-kayaking sessions may have amplified positive affective states. Comparisons with the control group (data not shown) further confirmed that changes were not attributable to general lifestyle factors alone but directly associated with the intervention. Key challenges included participant dropout (10%) due to schedule conflicts and minor injuries (none serious). Future interventions could integrate complementary practices such as mindfulness sessions post-training to maximize benefits. These findings suggest that canoe-kayaking can be an effective component of public wellness programs and rehabilitation settings.

5. CONCLUSION

Canoe-kayaking is a valuable holistic wellness activity that enhances cardiovascular fitness, muscular endurance, flexibility, and psychological well-being. The sport's accessibility and minimal joint stress make it suitable for a wide range of populations. Further studies should explore long-term adherence and impacts across different demographic groups.

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