

Multidimensional Public Health Benefits of Dragon Boat Racing: A Systematic Review

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Abstract

Dragon boat racing has expanded from a traditional cultural practice into a globally recognized team sport with increasing relevance for public health. Its combination of rhythmic physical exertion, coordinated teamwork, and cultural meaning positions it as a multifaceted activity that can support physical, psychological, neurocognitive, and social well-being. This systematic review integrates current evidence across these domains and identifies gaps that limit broader application in preventive and rehabilitative health. Research on physical outcomes shows notable improvements in muscular strength, cardiorespiratory fitness, functional capacity, and quality of life, particularly among breast cancer survivors, with strong evidence supporting its safety and rehabilitative benefits. Psychological studies highlight enhanced emotional resilience, identity reconstruction, and post-traumatic growth. Emerging neurocognitive findings indicate exercise-related modulation of attentional networks, improved neural efficiency, and strengthened functional connectivity. Social and cultural mechanisms, including team cohesion, shared identity, and engagement with tradition, appear to strengthen motivation, adherence, and community belonging. Despite these promising results, existing research remains fragmented and focused primarily on breast cancer populations. Overall, dragon boat racing shows considerable potential as a culturally grounded and community-based activity that supports holistic health, underscoring the need for broader and more rigorous investigation across diverse groups.

Keywords

dragon boat, physical health, psychological health, neurocognitive health, social and cultural mechanism

1. Introduction

Dragon boat racing represents a unique intersection of cultural heritage, community engagement, and health promotion. Originating more than 2,000 years ago in southern China, the sport is closely associated with the commemoration of Qu Yuan during the Duanwu Festival [1, 2]. Historical records describe villagers paddling along the Miluo River in search of Qu Yuan's body and casting rice dumplings (zongzi) into the water, a ritual that gradually evolved into organized competitions emphasizing rhythmic paddling and collective coordination [3]. The distinctive dragon-shaped boats, guided by a pacer and a drummer, reflect the integration of individual skill into synchronized team action, highlighting the interplay between cultural expression and social cohesion [1].

Over the past few decades, dragon boat racing has expanded beyond its traditional cultural setting to become a globally recognized sport under the International Dragon Boat Federation, with participation across Asia, Europe, North America, and Oceania [4]. This globalization has transformed dragon boat racing from a ritualistic seasonal event into a year-round competitive and recreational activity, while retaining its emphasis on shared identity, collective synchronization, and teamwork. The sport thus provides a model for culturally contextualized, community-based interventions that integrate physical activity with social and cultural engagement, which may support broader public health objectives such as inclusion, participation, and motivation.

From a public health perspective, dragon boat racing is particularly relevant as a multidimensional intervention, combining physical, cognitive, and social components within a culturally meaningful and socially embedded activity. Unlike conventional individual-focused exercise programs, dragon boat racing integrates group coordination, shared rhythm, and mutual reliance, which may enhance engagement, adherence, and motivation [5]. Its team-oriented nature can potentially reduce barriers such as social isolation, low motivation, and lack of perceived competence, thereby promoting sustained participation across diverse populations [6]. Moreover, the sport's cultural and historical roots provide a meaningful framework for participants, reinforcing identity, purpose, and community belonging [7].

Despite its growing popularity and recognized benefits, the existing literature presents several gaps. First, research on dragon boat racing is fragmented across disciplines, including sports science, oncology, rehabilitation, and psychology, with limited integration of physical, cognitive, and psychosocial perspectives. Second, research on the preventive and public health potential of dragon boat racing is limited, with few studies addressing its applicability beyond rehabilitation or clinical contexts. Finally, broader societal or community-level outcomes are lacking, constraining the development of evidence-based interventions.

Addressing these gaps requires a systematic conceptualization of dragon boat racing as a multidimensional public health intervention, integrating cultural, physiological, and psychosocial dimensions. The present study aims to provide this framework, focusing on two primary objectives: (1) to synthesize evidence on the multidimensional health effects of dragon boat participation, (2) to identify critical research gaps to inform future policy development. By emphasizing cultural context, social integration, and multidimensional health outcomes, this study seeks to position dragon boat racing as a model for community-centered, sustainable, and holistic health promotion interventions.

2. Literature Review

2.1 Physical Health

Dragon boat participation has been increasingly recognized as a multidimensional physical activity with substantial potential for rehabilitation and long-term health, particularly among clinical populations such as breast cancer survivors (Table 1) [8]. Unlike isolated aerobic or resistance training, dragon boat racing integrates sustained rhythmic paddling with coordinated neuromuscular demands involving upper-limb, trunk, and lower-limb muscle groups. This hybrid activity supports improvements in muscular strength, cardiorespiratory fitness, and functional capacity, all of which are key determinants of health outcomes and quality of life [8].

Empirical evidence supports the physical health benefits of dragon boat exercise. Mixed-methods and quantitative evaluations have demonstrated associations between structured dragon boat participation and improvements in health-related quality of life, including functional well-being, reduced fatigue, and enhanced shoulder mobility [8]. Breast cancer survivors completing a season of dragon boat racing exhibited statistically significant improvements in overall quality of life and physical functioning compared with baseline assessments [9]. Qualitative interviews further contextualized these improvements, showing that physical gains translated into enhanced daily activity and post-treatment resilience [8, 10].

Safety has been a critical focus, particularly regarding the risk of lymphedema [11]. Historically, repetitive upper-body exercise was discouraged in breast cancer survivors due to concerns about triggering or exacerbating swelling. However, longitudinal and observational data indicate that regular dragon boat participation does not increase lymphedema incidence, even among participants with prior axillary surgery or

radiation therapy [12]. These findings align with broader exercise-oncology research demonstrating that resistance training can be safely incorporated into post-treatment rehabilitation programs, improving muscle strength, body composition, fatigue management, and overall functional capacity [13].

Functional performance improvements have also been documented using standardized physical tests. Controlled intervention trials reported that breast cancer survivors participating in dragon boat training showed enhanced performance on the 6-minute walk test (6MWT), indicating gains in cardiorespiratory endurance, and the 30-second chair stand test (30CST), reflecting improved lower-limb muscular strength and functional mobility [14]. These outcomes highlight dragon boat's potential to improve clinically relevant rehabilitation markers in a structured, safe, and engaging manner.

Furthermore, dragon boat racing aligns with established exercise guidelines for cancer survivors, which recommend moderate-to-vigorous physical activity for 20–30 minutes, multiple times per week [15]. The combination of aerobic and resistance exercise within a team-oriented, rhythmic activity not only facilitates rehabilitation but also supports long-term maintenance of physical health and functional independence. Its low-cost, scalable format enhances accessibility and adherence, suggesting potential for preventive and community-based applications beyond clinical populations.

Table 1: Physical Health Benefits of Dragon Boat Racing

Domain	Key Findings
Multidimensional Activity	Combines aerobic, resistance, and neuromuscular engagement; involves upper-limb, trunk, and lower-limb muscle groups
Functional Outcomes	Improvements in muscular strength, cardiorespiratory fitness, and functional capacity
Health-Related Quality of Life	Enhanced functional well-being, reduced fatigue, improved shoulder mobility
Rehabilitation Efficacy	Breast cancer survivors exhibited significant improvements in overall quality of life and physical functioning; qualitative reports show enhanced daily activity and post-treatment resilience
Safety	No increase in lymphedema incidence even in participants with prior axillary surgery or radiation therapy; resistance training safely integrated into rehabilitation
Functional Performance	Improved 6-minute walk test (6MWT) distance and 30-second chair stand test (30CST) repetitions; enhanced endurance and lower-limb strength
Exercise Guidelines	Aligns with recommendations of 20–30 minutes of moderate-to-vigorous activity multiple times per week; supports long-term maintenance of functional independence
Accessibility & Scalability	Low-cost, team-based, culturally engaging format suitable for preventive and community-based programs

2.2 Psychological Health

A growing body of research highlights the psychosocial benefits of dragon boat racing, particularly among breast cancer survivors (BCS). Across 18 studies examining psychological outcomes, including 6 quantitative, 11 qualitative, and 1 mixed-methods design, 17 reported at least one psychosocial benefit associated with dragon boat racing [16]. This strong consistency, especially within qualitative evidence, suggests that dragon boat racing plays a meaningful role in supporting psychological well-being in clinical populations.

Qualitative and mixed-methods findings ($n = 12$) consistently report broad improvements in mental health and emotional resilience. Participants report enhanced stress-coping abilities, greater hope, reduced fear of cancer recurrence, and improved body image [17]. Many also report increased personal and team pride, along with the development of an “athlete identity,” reflecting a shift toward empowerment and capability [18]. Notably, the most frequently cited benefits relate to enhanced social support, both from peers and family members, fostered through the inherently team-based structure of dragon boat racing [19]. Survivors often emphasize the sense of being “in the same boat,” which facilitates mutual understanding, emotional validation, and shared motivation [8].

Dragon boat racing is also strongly associated with post-traumatic growth. Participants report regaining a sense of control over their bodies and lives, discovering new purposes and possibilities, and developing greater emotional strength and confidence [20]. This process is often accompanied by an increased acceptance of their cancer diagnosis and a deeper appreciation for life. These findings suggest that dragon boat functions not only

as a form of physical rehabilitation but also as a context for psychological adaptation and identity reconstruction following illness.

In contrast, quantitative and mixed-methods studies ($n = 7$) present more variable findings. While four studies reported significant improvements in quality of life, two found no significant changes [21]. Similarly, evidence regarding body image remains inconsistent, with one study reporting improvements and another observing no effect [22]. However, a quasi-experimental study conducted in Italy found that dragon boat participants experienced significantly fewer traumatic stress symptoms compared to individuals engaging in other forms of physical activity, indicating potential advantages in trauma-related psychological outcomes [23].

The psychosocial benefits of dragon boat racing are closely linked to its collective and supportive nature. The team environment promotes social connection, confidence building, and the exchange of experiences, all of which contribute to improved coping and emotional well-being [24]. However, the predominance of qualitative methodologies and the heterogeneity in program design, including variations in frequency, duration, and intensity, limit the generalizability of findings. Moreover, current evidence does not clearly demonstrate that dragon boat racing is superior to other forms of physical activity in improving psychological health outcomes.

Table 2: Psychological Health Benefits of Dragon Boat Racing

Domain	Key Findings
Psychosocial Well-being	Enhances stress-coping, hope, and emotional resilience; reduces fear of recurrence and traumatic stress symptoms
Identity & Empowerment	Facilitates the development of an “athlete identity”; increases personal/team pride, self-efficacy, and a sense of control
Social Support	Fosters team cohesion and social connectedness; provides emotional validation through the shared “in the same boat” experience
Post-Traumatic Growth	Supports identity reconstruction, greater acceptance of diagnosis, and the discovery of new life purposes and possibilities
Health Behaviors	Qualitative evidence suggests increased motivation for healthy dieting, regular exercise, and stress-management

2.3 Neurocognitive Health

Recent neurophysiological research indicates that even a single session of dragon boat exercise can significantly influence neural dynamics, enhancing both temporal and spatial coordination across large-scale brain networks [25]. Notably, this enhanced network synchronization persisted after intense, full-strength paddling, demonstrating robust engagement of functional brain systems.

Resting-state EEG microstates are established markers of neural activity and have been linked to various neurological conditions [26]. Microstate D, in particular, is associated with the frontal attention network and cognitive control [27]. Its duration and coverage reflect the level of attentional system activation and the efficiency of cognitive control processes, often in coordination with microstate C, which is linked to the salience network [28]. Study observed that professional dragon boat athletes exhibited significantly longer durations and greater coverage of microstate D than amateurs, even before exercise, consistent with findings in elite archers, in which experts showed elevated microstate D activity during rest and task preparation [27]. These findings suggest that long-term training may establish a heightened baseline state of attentional network readiness.

The effects of dragon boat training on microstate dynamics may be mediated by neural plasticity, reflecting lasting adaptations in synaptic efficiency and functional connectivity induced by repeated motor learning and skill practice [29]. Activation of microstate D likely engages the dorsal attention network, supporting sustained attention and task-related cognitive processing [27, 29]. Similar enhancements in attention-related networks have been observed following traditional mind-body exercises and aerobic training, reinforcing the idea that dragon boat activity strengthens attentional control through repeated cognitive-motor coordination [30].

Microstate C, primarily involving the anterior insula and anterior cingulate cortex, supports salience detection and facilitates switching between the default mode and central executive networks [28]. Acute dragon boat exercise increased the duration of microstate C in amateur participants, reflecting engagement of the

salience network and integration of autonomic and somatosensory signals during exertion [27, 29]. These results suggest that physical activity modulates both attentional and salience systems, enabling efficient monitoring of bodily states alongside cognitive demands.

Beyond microstates, brain complexity measures provide additional insight into neural efficiency. Professional athletes exhibited lower complexity in the alpha and beta frequency bands than amateurs, particularly in frontal regions, indicating more orderly and efficient cortical networks [31]. Reduced complexity likely reflects enhanced information processing, stronger attentional control, and greater resistance to cognitive interference. Acute exercise further modulated these parameters, supporting the “exercise start-up effect,” whereby transient increases in cortical excitability and functional connectivity enhance cognitive and motor performance [32].

In summary, dragon boat exercise acutely engages and strengthens neural networks underlying attention, salience detection, and cognitive control. Professional-level training appears to elevate baseline attentional states and optimize network efficiency, while even a single session transiently enhances functional connectivity and cortical synchronization. These findings highlight dragon boat racing as a cognitively engaging form of physical activity with potential benefits for neurocognitive health and resilience. Future longitudinal studies are needed to determine whether sustained participation produces lasting enhancements in cognitive function and network efficiency.

Table 3: Neurocognitive Health Benefits of Dragon Boat Racing

Domain	Key Findings
Neural Synchronization	Enhances temporal and spatial coordination across large-scale brain networks; effects persist even after intense physical exertion
Attentional Readiness	Long-term training increases the duration and coverage of Microstate D, suggesting a heightened baseline state of the frontal attention network
Salience & Monitoring	Acute exercise increases Microstate C activity, facilitating better integration of autonomic signals and switching between internal and external focus
Neural Efficiency	Professional athletes show lower brain complexity in alpha/beta bands, indicating more orderly cortical networks and resistance to cognitive interference
Neuroplasticity	Repeated motor learning and coordination likely induce lasting adaptations in synaptic efficiency and functional connectivity

2.4 Social and Cultural Mechanisms

In addition to its physical, cognitive, and psychological benefits, dragon boat participation fosters social and cultural engagement, which may serve as a key mechanism supporting health outcomes. The inherently team-oriented nature of the sport requires coordinated effort, shared rhythm, and mutual dependence, creating a context in which social cohesion and interpersonal trust are actively cultivated [19]. Participants frequently describe experiences of collective accomplishment, enhanced communication, and emotional validation, reflecting the integration of social processes into physical activity. These mechanisms are particularly salient among breast cancer survivors, where peer support, encouragement, and shared challenges contribute to adaptive coping and post-traumatic growth [8].

Cultural context further amplifies the psychosocial benefits of dragon boat racing. Rooted in over two millennia of tradition, dragon boat racing embodies values of collectivism, ritual, and community identity [33]. Participation in culturally meaningful activity not only reinforces a sense of belonging but also strengthens participants’ connection to heritage and collective memory, which may enhance self-concept, motivation, and resilience [1]. Such cultural integration distinguishes dragon boat racing from other forms of exercise, providing a dual pathway through which physical activity promotes psychological and social well-being.

The social environment of dragon boat racing also facilitates identity reconstruction and empowerment. Participants often report development of an “athlete identity” that coexists with their patient or survivor identity, which supports agency, confidence, and a sense of control over one’s body and capabilities [18]. Shared goal setting, mutual accountability, and team strategies further promote self-efficacy and collective efficacy, providing a framework for sustained engagement in physical and health-promoting behaviors. In this sense, dragon boat functions as both a structured social intervention and a culturally anchored activity, enabling participants to leverage community, culture, and teamwork as resources for health maintenance and recovery.

Despite these advantages, empirical investigation of social and cultural mechanisms remains limited. Most studies have prioritized physical or psychological outcomes, with relatively few quantifying social cohesion, identity formation, or cultural engagement. By emphasizing social and cultural pathways, dragon boat racing can be positioned as a potential intervention in which physical, neurocognitive, and psychosocial domains are interdependent, and health benefits are reinforced through culturally and socially meaningful engagement. This perspective highlights the potential of dragon boat racing to function not only as a rehabilitative exercise but also as a community-based preventive intervention, supporting well-being across diverse populations.

Table 4: Social and Cultural Mechanisms in Dragon Boat Racing

Domain	Key Findings
Social Cohesion	Cultivates interpersonal trust and mutual dependence through shared rhythm; provides emotional validation and peer support
Cultural Identity	Reinforces a sense of belonging and connection to heritage via ritual and collectivist values rooted in tradition
Identity Reconstruction	Enables the development of an athlete identity to coexist with or supersede a “patient identity,” fostering agency and confidence
Collective Efficacy	Leverages shared goal setting and mutual accountability to promote self-efficacy and sustained health-promoting behaviors
Community Integration	Functions as a structured social intervention that uses community and culture as primary resources for long-term recovery

3. Policy Development

The multidimensional benefits of dragon boat participation underscore its potential as a public health intervention with implications for policy development across healthcare, community programming, and preventive health frameworks. Evidence from clinical, cognitive, and psychosocial studies indicates that dragon boating can enhance functional capacity, cognitive control, emotional resilience, and social integration, particularly among vulnerable populations such as breast cancer survivors. These findings provide a robust rationale for the integration of culturally and socially structured physical activity programs into national health promotion policies.

First, policymakers should consider supporting the inclusion of dragon boating as a structured rehabilitation and preventive program within healthcare systems. Rehabilitation guidelines for cancer survivors and other clinical populations can incorporate team-based, high-intensity activities that combine aerobic and resistance training with social and cognitive engagement, thereby aligning clinical recommendations with evidence-based interventions. Establishing standardized protocols for program design, including session frequency, intensity, and progression, will ensure safety, reproducibility, and scalability across healthcare settings.

Second, at the community level, public health agencies and municipal authorities can promote access to dragon boat programs as a means of supporting physical activity, social cohesion, and cultural engagement. Local governments can fund community-based facilities, provide equipment, and create inclusive leagues targeting diverse populations, including youth, and people with chronic health conditions. Policies promoting team-based and culturally meaningful activities may enhance engagement, adherence, and long-term health outcomes, particularly in populations at risk for social isolation or functional decline [34].

Third, educational and preventive health initiatives can leverage dragon boat racing as a platform to integrate health literacy, lifestyle modification, and wellness promotion. School and university-based programs, workplace wellness initiatives, and public campaigns can incorporate dragon boat experiences to simultaneously address physical fitness, cognitive stimulation, stress reduction, and social skills development. Policymakers should ensure equity of access, including strategies to remove barriers related to gender, socioeconomic status, or geographic location, in order to maximize population-level impact.

Finally, at the national or institutional level, dragon boat racing can be incorporated into policy frameworks that address chronic disease prevention and survivorship care. Policymakers should support research funding for longitudinal studies, program evaluation, and mechanistic investigations to further refine the design, dose, and delivery of dragon boat interventions. Evidence-informed guidelines should explicitly address safety standards, inclusion criteria, and culturally tailored adaptations, ensuring that interventions are both effective and ethically implemented.

4. Conclusion

This systematic review demonstrates that dragon boat racing offers multidimensional public health benefits that extend across physical, psychological, neurocognitive, and social domains. Evidence highlights consistent improvements in functional capacity, emotional resilience, cognitive control, and community connectedness, supported by the sport's culturally meaningful and team-based structure. Although current research is strongest among breast cancer survivors, the collective findings position dragon boating as a promising model for holistic, community-centered health promotion. Broader, more rigorous, and more diverse investigations are needed to clarify mechanisms, strengthen generalizability, and inform the development of standardized, scalable interventions.

5. Limitation and Future Study

Despite the compelling evidence supporting the multidimensional benefits of dragon boat participation, several important limitations in the existing literature must be acknowledged. First, most studies focus on breast cancer survivors, resulting in a restricted generalizability of findings. This narrow clinical focus limits our understanding of dragon boating's effects in other populations, including healthy adults, older adults at risk of functional decline, and high-performance or recreational athletes. Additionally, participant samples are predominantly female, which constrains insights into potential sex-specific physiological and psychological responses to team-based, high-intensity exercise. Future studies should deliberately recruit male participants and explore gender differences in both physical and psychosocial outcomes.

Second, the current body of research is largely reactive, emphasizing rehabilitation rather than prevention. While dragon boating demonstrates clear rehabilitative benefits, its potential as a preventive public health intervention, supporting functional capacity, cognitive resilience, and emotional well-being in non-clinical populations, remains largely unexplored. Similarly, most studies target adult populations, leaving knowledge gaps regarding youth, adolescents, and older age groups, who may benefit differently from coordinated, team-oriented physical activity. Investigating these populations could elucidate age-related adaptations in physical, cognitive, and psychosocial domains.

Third, many studies are constrained by methodological limitations, including small sample sizes, reliance on self-reported outcomes, and heterogeneity in study design, intervention duration, intensity, and measurement tools. These factors reduce statistical power, limit reproducibility, and hinder the identification of causal relationships. Furthermore, there is a lack of standardized protocols for dragon boat interventions, complicating cross-study comparisons and meta-analytic synthesis.

Finally, while evidence highlights the mechanisms of physical, cognitive, and psychosocial benefit, mechanistic understanding remains incomplete. Few studies integrate multidimensional assessments to examine interactions between physiological adaptations, neurocognitive function, and social or cultural influences. Future research should incorporate objective biomarkers, neuroimaging, and longitudinal designs to capture these dynamic, multidomain effects, enabling a more precise understanding of how dragon boat contributes to holistic health outcomes.

References

- [1] Harris, S.R., "We're All in the Same Boat": A Review of the Benefits of Dragon Boat Racing for Women Living with Breast Cancer. *Evidence-Based Complementary and Alternative Medicine*, 2012. 2012(1): p. 167651.
- [2] Chittick, A., The song navy and the invention of dragon boat racing. *Journal of Song-Yuan Studies*, 2011(41): p. 1-28.
- [3] Sofield, T.H. and A. Sivan, From cultural festival to international sport-the Hong Kong dragon boat races. *Journal of Sport Tourism*, 2003. 8(1): p. 9-20.
- [4] Wilson, M., Dragon boat festivals: An international collection of events, in *Planning and Managing Smaller Events*. 2020, Routledge. p. 117-127.

- [5] King, A. and M. de Rond, Boat race: rhythm and the possibility of collective performance 1. *The British journal of sociology*, 2011. 62(4): p. 565-585.
- [6] Huang, Y. and B. Long, Enhancing ethnic traditional sports education through sports psychology: significance, challenges, and strategies. *Psychology research and behavior management*, 2025: p. 993-1005.
- [7] Fong, A.J., et al., "We're all in the same boat together": Exploring quality participation strategies in dragon boat teams for breast cancer survivors. *Disability and Rehabilitation*, 2021. 43(21): p. 3078-3089.
- [8] Ray, H.A. and M.J. Verhoef, Dragon boat racing and health-related quality of life of breast cancer survivors: a mixed methods evaluation. *BMC complementary and alternative medicine*, 2013. 13(1): p. 205.
- [9] McDonough, M.H., et al., The difference is more than floating: factors affecting breast cancer survivors' decisions to join and maintain participation in dragon boat teams and support groups. *Disability and Rehabilitation*, 2019. 41(15): p. 1788-1796.
- [10] Milne, M., The sport of dragon boat racing as experienced by breast cancer survivors. 2014, University of Southampton.
- [11] Gillespie, T.C., et al., Breast cancer-related lymphedema: risk factors, precautionary measures, and treatments. *Gland surgery*, 2018. 7(4): p. 379.
- [12] Herrero-Zapirain, I., et al. The effect of Dragon boating on the quality of life for breast cancer survivors: a systematic review. in *Healthcare*. 2024. MDPI.
- [13] Evans, H., et al., Effects of a prescribed, supervised exercise programme on health-related quality of life in oncology patients: A retrospective observational cohort study. *Journal of Clinical Exercise Physiology*, 2024. 13(s2): p. 493-493.
- [14] Alvarez, N., Effect of the Order of Resistance and Cardiorespiratory Training on Muscular Strength, Cardiovascular Fitness, and Quality of Life in Cancer Survivors. 2024, Adams State University.
- [15] Campbell, K.L., et al., Exercise guidelines for cancer survivors: consensus statement from international multidisciplinary roundtable. *Medicine and science in sports and exercise*, 2019. 51(11): p. 2375.
- [16] Yeung, N.C.Y., et al., "Phoenix Rising": A scoping review on the impacts of dragon boating exercise on well-being among breast cancer survivors and factors affecting their participation. *Journal of Exercise Science & Fitness*, 2026: p. 200453.
- [17] Sabiston, C.M., M.H. McDonough, and P.R. Crocker, Psychosocial experiences of breast cancer survivors involved in a dragon boat program: exploring links to positive psychological growth. *Journal of sport and exercise psychology*, 2007. 29(4): p. 419-438.
- [18] Mitchell, T.L., et al., Survivor dragon boating: a vehicle to reclaim and enhance life after treatment for breast cancer. *Health Care for Women International*, 2007. 28(2): p. 122-140.
- [19] McDonough, M.H., C.M. Sabiston, and S. Ullrich-French, The development of social relationships, social support, and posttraumatic growth in a dragon boating team for breast cancer survivors. *Journal of Sport and Exercise Psychology*, 2011. 33(5): p. 627-648.
- [20] Guinto, M.L.M. and R. Psy, "I am a complete woman": Dragon boat and breast cancer survival. *Revista de Psicología del Deporte (RPD)/Journal of Sport Psychology (JSP)*, 2017.
- [21] Denieffe, S., C. Castineira, and M. Denny, The impact of Dragon boating for fatigue in cancer survivors. *The Journal for Nurse Practitioners*, 2021. 17(8): p. 1019-1022.
- [22] Moro, T., et al., Keep calm and keep rowing: the psychophysical effects of dragon boat program in breast cancer survivors. *Supportive Care in Cancer*, 2024. 32(4): p. 218.
- [23] Fioretti, C., et al., The effectiveness of Dragon Boat racing on body image and traumatic symptoms of breast cancer patients. *Health Psychology Research*, 2024. 12: p. 120055.

- [24] Lavallee, J.F., et al., Barriers and facilitators to participating in physical activity for adults with breast cancer receiving adjuvant treatment: a qualitative metasynthesis. *Psycho-oncology*, 2019. 28(3): p. 468-476.
- [25] Jiang, H., et al., Dragon boat exercise reshapes the temporal-spatial dynamics of the brain. *PeerJ*, 2024. 12: p. e17623.
- [26] Khanna, A., et al., Microstates in resting-state EEG: current status and future directions. *Neuroscience & Biobehavioral Reviews*, 2015. 49: p. 105-113.
- [27] Bréchet, L., et al., Capturing the spatiotemporal dynamics of self-generated, task-initiated thoughts with EEG and fMRI. *Neuroimage*, 2019. 194: p. 82-92.
- [28] Custo, A., et al., Electroencephalographic resting-state networks: source localization of microstates. *Brain connectivity*, 2017. 7(10): p. 671-682.
- [29] Dayan, E. and L.G. Cohen, Neuroplasticity subserving motor skill learning. *Neuron*, 2011. 72(3): p. 443-454.
- [30] Xia, R., et al., The effect of traditional Chinese mind-body exercise (Baduanjin) and brisk walking on the dorsal attention network in older adults with mild cognitive impairment. *Frontiers in psychology*, 2019. 10: p. 2075.
- [31] Babiloni, C., et al., “Neural efficiency” of experts’ brain during judgment of actions: a high-resolution EEG study in elite and amateur karate athletes. *Behavioural brain research*, 2010. 207(2): p. 466-475.
- [32] Ciria Pérez, L.F., et al., Oscillatory brain activity during acute exercise: Tonic and transient neural response to an oddball task. 2019.
- [33] Yiming, Z., Study on the Cultural Value Recognition of Ethnic Groups and Rural Sports Activities——Analysis Based on Traditional Dragon Boat Racing Ceremony. *Frontiers in Sport Research*, 2025. 7(3).
- [34] Changeris, M., Enhancing primary care for older adults: the safety, efficacy, and adherence (SEA) team-based care model to reduce adverse medication outcomes. *Frontiers in Public Health*, 2025. 13: p. 1453485.

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Conflicts of Interest

The authors declare no conflict of interest.

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