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The Pros of Swimming for Human Health and Recreational Fisheries in the Blue Economy: Review

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ABSTRACT*: This review examines the pros of swimming for human health and recreational fisheries in the blue economy. It explores the various benefits of both activities and how they contribute to economic growth, environmental sustainability, and social well-being. The article also discusses the challenges and opportunities associated with promoting these activities within the blue economy framework. Swimming as one of the most popular modes of physical activity, it confers significant physical health benefits for both healthy individuals and those with disease; these health benefits extend across the entire life-course – as it has presented evidence that demonstrates favourable effects of aquatic exercise from foetus through to the frail elderly. There is a copious data considering aquatic exercise per se, there is relatively much less exploring the effects of swimming as a unique activity. It is imperative that this is addressed in future research, particularly given the compelling evidence presented that swimmers demonstrate lower all-cause mortality rates, and reduced incidence of falls in later life. The unique nature of the aquatic environment as a medium for exercise and physical activity has been comprehensively described. What is evident is that water-based exercise can confer a number of specific advantages, as compared to land-based exercise. As an environment that offers reduced weight-bearing stress, higher humidity levels, decreased heat load and a greater margin of therapeutic safety in terms of falls-risk, swimming/aquatic exercise is extremely well-placed to safely and effectively meet the needs of a wide-range of individuals, in both the treatment and prevention of physical health issues. Water-based exercise prescription should be a key consideration for health care clinicians and commissioners as we tap into the blue economy wealth.*

KEYWORDS: swimming, human health, recreational fisheries, economic growth, environmental sustainability, social well-being.

INTRODUCTION

Swimming is a universal activity that holds immense value for human health, recreational fisheries, and the blue economy. As a form of exercise, it offers a plethora of physical, mental, and social benefits, while also serving as a cornerstone of recreational activities in marine and coastal environments. In recent years, there has been growing recognition of the positive impacts of swimming on both individual well-being and broader socioeconomic and environmental contexts. This introduction provides an overview of the pros of swimming on human health and recreational fisheries within the blue economy, drawing upon empirical evidence, expert opinions, and policy frameworks. Swimming has long been celebrated for its therapeutic and health-promoting properties. As a low-impact aerobic exercise, swimming engages multiple muscle groups, enhances cardiovascular fitness, and improves overall physical endurance (Sanders *et al*., 2017).

The buoyancy of water reduces stress on joints and muscles, making swimming an ideal activity for individuals of all ages and fitness levels, including those with arthritis, back pain, or mobility limitations (Huang *et al*., 2020). Moreover, swimming is associated with a myriad of health benefits, including weight management, reduced risk of chronic diseases such as diabetes and heart disease, and improved mental well-being (O'Connor *et al*., 2018). Research has consistently demonstrated the positive effects of swimming on various health indicators. A meta-analysis by O'Connor *et al*. (2018) found that swimming was associated with significant reductions in blood pressure, cholesterol levels, and body fat percentage among participants with hypertension. Similarly, studies have shown that regular swimming can improve lung function, respiratory capacity, and overall cardiovascular health (Tanaka *et al*., 2019). Furthermore, swimming has been linked to enhanced cognitive function, mood regulation, and stress reduction, highlighting its holistic benefits for mental well-being (Barker *et al*., 2018). The accessibility and versatility of swimming make it a preferred choice for individuals seeking to improve their health and fitness. Unlike land-based exercises, swimming offers a full-body workout without putting excessive strain on joints or risking injury. Its adaptability to different environments, including pools, lakes, rivers, and oceans, provides opportunities for people to engage in swimming activities year-round, regardless of geographical location or climate conditions. Moreover, swimming can be enjoyed individually or as part of group activities, fostering social connections and community engagement that further contribute to overall well-being (Kirk *et al*., 2019).

Recreational fisheries, which encompass activities such as fishing, boating, and swimming, play a vital role in the blue economy, which refers to sustainable economic activities related to oceans, seas, and coastal areas. While fishing is often the focal point of discussions about recreational fisheries, swimming represents another significant component that contributes to the economic, social, and environmental dimensions of the blue economy (Fletcher *et al*., 2020). Coastal and marine environments serve as popular destinations for recreational activities, including swimming, snorkeling, and beachgoing. These activities attract tourists and visitors, stimulating local economies through expenditures on accommodations, dining, and recreational services (Hoegh-Guldberg *et al*., 2015). Swimming events, such as open water races and triathlons, bring participants and spectators together, generating revenue for businesses and supporting job creation in coastal communities (Johnson and Simms, 2018). Furthermore, investments in beach amenities, lifeguard services, and water quality management enhance the attractiveness and competitiveness of coastal destinations, contributing to sustainable economic growth (Pendleton *et al*., 2018).

In addition to its economic contributions, swimming within recreational fisheries promotes social interactions, cultural exchange, and community cohesion along coastlines and waterfronts. Beaches, rivers, and coastal waters serve as gathering places where people come together to enjoy recreational activities, celebrate cultural traditions, and connect with nature (Voyer *et al*., 2018). Swimming clubs, competitions, and festivals provide opportunities for social bonding, skill development, and cultural expression, strengthening social ties and promoting a sense of belonging within coastal communities (Friedland *et al*., 2019).

However, the sustainable management of swimming within recreational fisheries presents challenges related to safety, access, and environmental conservation. Addressing these challenges requires collaborative efforts among policymakers, stakeholders, and local communities to develop and implement effective management strategies that balance the economic benefits of swimming with the preservation of marine ecosystems and biodiversity (Cicin-Sain and Belfiore, 2019).

AIM AND OBJECTIVES OF THE REVIEW

Aim

The work aims at reviewing recent data on the pros of swimming for human health and recreational fisheries in the blue economy.

Objectives

The specific objectives of the review are to:

a). elucidate the health benefits of swimming for individuals of all ages and fitness levels;

b). examine the role of swimming in promoting recreational fisheries and enhancing aquatic biodiversity;
c). assess the contributions of swimming to the blue economy, including tourism, sports industries, and coastal communities.
d). provide recommendations for maximizing the positive impacts of swimming on human health and recreational fisheries within the framework of the blue economy.

HEALTH BENEFITS OF SWIMMING FOR HUMANS

Swimming is a highly accessible and enjoyable form of exercise that offers a wide array of health benefits. From improving cardiovascular fitness to enhancing muscular strength and flexibility, swimming is recognized as a holistic activity that promotes overall well-being. This literature review aims to provide a comprehensive overview of the pros of swimming for human health, drawing upon empirical evidence, expert opinions, and theoretical frameworks.

Cardiovascular Health

Cardiovascular health is one of the primary areas where swimming demonstrates significant benefits. Numerous studies have shown that regular swimming can improve cardiovascular fitness, reduce the risk of heart disease, and lower blood pressure levels. According to a meta-analysis conducted by O'Connor et al. (2018), swimming was associated with a significant reduction in systolic blood pressure and an improvement in lipid profiles among participants with hypertension. The aerobic nature of swimming engages large muscle groups, leading to increased cardiac output and improved circulation, thereby enhancing overall cardiovascular function (Wilcox, 2019).

Muscular Strength And Endurance

Swimming engages various muscle groups throughout the body, making it an excellent form of resistance training. Unlike other forms of exercise, such as running or cycling, swimming provides resistance in all directions, leading to balanced muscle development and improved muscular strength and endurance (Colado & Triplett, 2008). Research conducted by Tanaka et al. (2019) demonstrated that swimmers exhibit greater upper body strength and endurance compared to sedentary individuals. Moreover, swimming has been shown to alleviate symptoms of musculoskeletal conditions such as arthritis and back pain, due to its low-impact nature and the buoyancy of water, which reduces stress on the joints (Huang *et al.*, 2020).

Weight Management

Swimming is an effective activity for weight management and body composition improvement. The combination of aerobic exercise and resistance training involved in swimming promotes calorie expenditure and increases lean muscle mass, thereby aiding in weight loss and fat reduction (Kirk *et al*., 2019). A systematic review by Schoenfeld *et al*. (2020) highlighted the role of swimming in promoting fat loss while preserving lean body mass, making it a valuable component of weight management

programs. Furthermore, swimming can be particularly beneficial for individuals with obesity or mobility issues, as it provides a low-impact alternative to land-based exercises (Kramer and Maglischo, 2019).

Mental Well-being

In addition to its physical benefits, swimming has positive effects on mental health and psychological well-being. The rhythmic and repetitive nature of swimming, combined with the sensory experience of being in water, has a calming effect on the mind and helps reduce stress and anxiety (Barker *et al*., 2018). Research conducted by Penedo & Dahn (2005) demonstrated that swimming can elevate mood, alleviate symptoms of depression, and improve overall quality of life. The meditative aspect of swimming, characterized by focused breathing and rhythmic movement, promotes mindfulness and relaxation, contributing to mental clarity and emotional resilience (Beilock and Carr, 2019).

Injury Rehabilitation

Swimming is often recommended as a form of rehabilitation for individuals recovering from injuries or managing chronic conditions. The buoyancy of water reduces the impact on joints and muscles, allowing for low-impact exercise that facilitates recovery and promotes mobility (Pollock *et al.*, 2019). Studies have shown that swimming-based rehabilitation programs can improve range of motion, muscle strength, and functional capacity in patients with conditions such as osteoarthritis, fibromyalgia, and spinal cord injuries (Cuesta-Vargas *et al*., 2018). Moreover, aquatic therapy, which incorporates swimming and other water-based exercises, has been effective in accelerating the rehabilitation process and enhancing overall outcomes for individuals recovering from orthopedic surgeries or sports injuries (Becker *et al*., 2021).

Swimming As Therapeutic Intervention

Beyond its recreational and fitness-related benefits, swimming is increasingly recognized as a therapeutic intervention for various health conditions. Aquatic therapy, which encompasses a range of exercises performed in water, is widely used in rehabilitation settings to address physical impairments, improve functional abilities, and enhance quality of life for individuals with disabilities or chronic illnesses (Yildirim and Parlak, 2020). The hydrostatic pressure exerted by water helps reduce swelling and inflammation, while the resistance provided by water enhances muscle strength and cardiovascular fitness (Belli et al., 2019). Furthermore, swimming has been incorporated into treatment programs for conditions such as chronic pain, fibromyalgia, and post-traumatic stress disorder (PTSD), owing to its analgesic and stress-reducing effects (Becker *et al*., 2021).

Age-specific Benefits

Swimming offers unique benefits for individuals across different age groups, from children to older adults. For children and adolescents, swimming provides opportunities for physical activity, skill development, and social interaction, contributing to overall health and well-being (Drenowatz *et al*., 2019). Research has shown that children who participate in swimming programs demonstrate improved motor skills, coordination, and cognitive development compared to their sedentary peers (Ratel *et al*.,

2020). Additionally, swimming has been associated with a reduced risk of childhood obesity and related health problems (Ferreira *et al*., 2018).

In older adults, swimming can help maintain mobility, balance, and independence, reducing the risk of falls and age-related decline (Taylor and Brown, 2020). Studies have shown that regular swimming can improve cognitive function, memory, and executive control in older adults, potentially reducing the risk of neurodegenerative diseases such as Alzheimer's (McGrath *et al*., 2019). Furthermore, swimming has been linked to improved sleep quality, mental acuity, and overall quality of life in older populations (O'Halloran *et al*., 2021).

SWIMMING FOR RECREATIONAL FISHERIES

Recreational fisheries, which include activities such as swimming, fishing, and boating, are integral components of leisure in tourism industries worldwide; while fishing often takes center stage in discussions about recreational fisheries, swimming represents another popular and accessible activity that contributes to the overall enjoyment and engagement of participants. This review aims to explore the benefits of swimming within the context of recreational fisheries, shedding light on its physical, mental, social, and economic dimensions (benefits).

Physical Health Benefits

Swimming offers numerous physical health benefits to individuals engaged in recreational fisheries. As a low-impact aerobic exercise, swimming provides a full-body workout that improves cardiovascular fitness, muscular strength, and endurance (Sanders *et al*., 2017). In the context of recreational fishing, swimming can serve as a form of cross-training, complementing other activities such as fishing or boating. Research has shown that regular swimming can help prevent chronic diseases such as obesity, diabetes, and cardiovascular disorders, thereby promoting overall health and well-being (Giangreco *et al*., 2020).

Mental Well-being

In addition to its physical benefits, swimming has positive effects on mental health and psychological well-being, which are particularly relevant within the context of recreational fisheries. The immersive experience of swimming in natural water bodies, such as lakes, rivers, or oceans, provides a sense of tranquility and connection with nature (White *et al*., 2018). Studies have shown that exposure to natural environments, including aquatic settings, can reduce stress, anxiety, and symptoms of depression (Barton and Pretty, 2010). Swimming in recreational fishing environments offers participants an opportunity to unwind, de-stress, and rejuvenate their mental faculties, contributing to overall happiness and life satisfaction.

Social Interactions

Swimming within recreational fisheries fosters social interactions and community engagement, enriching the overall experience for participants. Whether swimming with friends, family, or fellow

anglers, recreational fishers often form bonds and build relationships while enjoying water-based activities (Moore *et al*., 2019). Swimming events, such as open water races or beach gatherings, bring together individuals from diverse backgrounds, promoting social cohesion and a sense of belonging (Van Tuyckom *et al*., 2016). Moreover, swimming clubs and organizations play a vital role in facilitating social connections and promoting aquatic sports within recreational fishing communities.

Economic Impact

The economic impact of swimming within recreational fisheries extends beyond individual participation to encompass tourism, recreation, and infrastructure development. Waterfront destinations that offer swimming opportunities attract tourists and visitors, stimulating local economies through expenditures on accommodations, dining, and recreational services (Simpson and Buckworth, 2017). Moreover, investments in aquatic facilities, such as swimming pools, beaches, and waterfront parks, contribute to job creation and economic development in coastal and lakeside communities (Nasar *et al*., 2018). The promotion of swimming as a recreational activity within fisheries management strategies can enhance the attractiveness and competitiveness of destinations, thereby supporting sustainable tourism and economic growth.

Environmental Considerations

Swimming provides numerous benefits within recreational fisheries, it is essential to consider its environmental implications and potential impacts on aquatic ecosystems. Water quality, habitat preservation, and pollution control are critical factors that influence the suitability of water bodies for swimming activities (Davenport *et al*., 2019). Recreational fisheries management should prioritize the conservation and sustainable use of natural resources to ensure the long-term viability of swimming and other recreational activities. Additionally, education and awareness campaigns can promote responsible swimming practices and environmental stewardship among participants, minimizing negative impacts on aquatic ecosystems.

Challenges and Opportunities

Despite the inherent benefits of swimming within recreational fisheries, several challenges exist, including safety concerns, access limitations, and environmental degradation. Addressing these challenges requires collaboration among stakeholders, including government agencies, conservation organizations, and local communities (Lamberti *et al*., 2020). By integrating swimming promotion and management strategies into broader recreational fisheries frameworks, policymakers can maximize the benefits of swimming while mitigating associated risks. Opportunities for innovation, such as the development of eco-friendly swimming facilities or the implementation of water quality monitoring programs, can further enhance the sustainability and attractiveness of swimming within recreational fisheries.

Aquatic environments pose a wide range of threats to human health and well-being. There are an estimated 370,000 drownings globally per year (WHO. 2014), and water-borne diseases such as cholera

(Ali et al., 2015; Nelson *et al*., 2015), account for nearly two (2) million deaths annually, mostly among children under 5 years (WHO. 2019). Storms and floods exacerbate both issues, especially if drinking water supplies and sanitation facilities are contaminated with polluted floodwaters, events that are expected to increase in many parts of the world under climate change and sea level rise (Neumann *et al*., 2015). Recreational bathing waters are associated with large numbers of gastro-enteric infections when contaminated with human or animal sewage, with the loss of some 66,000 disability-adjusted life years (DALYs) annually (Shuval, 2003). Chemical pollution from mining, agriculture and industry (Landrigan *et al*., 2018), harmful algal blooms (Fleming *et al*., 2015), and emerging threats such as pharmaceuticals (Webb et al., 2003), and micro-plastics (Science Advice for Policy by European Academies (SAPEA. 2019), all have the potential to undermine human health and well-being though contact with aquatic environments (Borja *et al*., 2020; Fleming *et al*., 2014; 2019; Depledge *et al*., 2017; 2019).

SWIMMING TO THE BLUE ECONOMY

The blue economy, characterized by sustainable economic activities that utilize and conserve marine resources, is recognized as a driver of economic growth, innovation, and environmental stewardship; while traditional sectors such as fisheries and maritime transportation have long been associated with the blue economy, recreational activities like swimming also contribute significantly to its vitality and resilience. This review explores the multifaceted role of swimming in the blue economy, highlighting its economic, social, environmental, and cultural significance.

Economic Contributions

Swimming contributes to the economic prosperity of coastal communities through various channels, including tourism, recreation, and infrastructure development. Coastal destinations with swimming facilities attract tourists and visitors, generating revenue from accommodations, dining, and recreational services (Hoegh-Guldberg *et al*., 2015). Swimming events, such as open water races and triathlons, stimulate local economies by attracting participants and spectators, supporting small businesses, and creating employment opportunities (Williams *et al*., 2019). Furthermore, investments in beach amenities, lifeguard services, and water quality management enhance the attractiveness and competitiveness of coastal destinations, driving sustainable economic growth (Johnson and Simms, 2018).

Social and Cultural Benefits

Swimming fosters social interactions, cultural exchange, and community cohesion within coastal regions, enriching the fabric of local societies; beaches, rivers, and coastal waters serve as gathering places where people of diverse backgrounds come together to enjoy recreational activities, celebrate cultural traditions, and connect with nature (Pendleton *et al*., 2018). Swimming clubs, competitions, and festivals provide opportunities for social bonding, skill development, and cultural expression, strengthening social ties and promoting a sense of belonging (Fletcher *et al*., 2020). Moreover, swimming plays a significant role in cultural practices, rituals, and ceremonies among coastal

communities, reflecting the intrinsic connection between humans and the marine environment (Voyer *et al*., 2018).

Environmental Considerations

It is truism that swimming offers numerous benefits within the blue economy, it is essential to consider its environmental impacts and implications for marine conservation and sustainability. Coastal development, pollution, and habitat degradation pose significant threats to marine ecosystems and biodiversity, affecting the quality and safety of swimming environments (UNEP. 2017). Sustainable coastal management practices, including marine spatial planning, ecosystem-based approaches, and integrated coastal zone management, are essential for minimizing adverse impacts and safeguarding the health of marine ecosystems (Cicin-Sain and Belfiore, 2019). Moreover, public awareness campaigns, environmental education programmes, and citizen science initiatives can promote responsible swimming behaviors and encourage active participation in marine conservation efforts (Nash *et al*., 2020).

Challenges And Opportunities

Despite its potential contributions to the blue economy, swimming faces various challenges, including safety concerns, access limitations, and environmental degradation. Addressing these challenges requires collaboration among government agencies, stakeholders, and local communities to develop and implement effective management strategies (Friedland *et al*., 2019). Opportunities for innovation, such as the adoption of green technologies, sustainable tourism practices, and nature-based solutions, can enhance the sustainability and resilience of swimming within the blue economy (Hockings *et al*., 2021). Furthermore, integrating swimming promotion and management into broader blue economy frameworks can unlock synergies and maximize the socio-economic benefits of marine recreation while preserving marine ecosystems for future generations.

CONCLUSION

It will sound very funny to be asked that, When did you swim last? Or do you know how to swim? Swimming emerges as a powerful tool for promoting human health and recreational fisheries within the blue economy. Its myriad benefits extend beyond physical fitness to encompass mental well-being, environmental stewardship, and economic prosperity. By embracing swimming as a multifunctional activity, policymakers, stakeholders, and individuals can harness its potential to enhance the quality of life, foster sustainable development, and preserve aquatic ecosystems for future generations.

Just of recent, Miss Are., the lovely daughter of Mrs. Nelson-Ebimie wrote a letter appealing to her lovely mum to take them for swimming picnic, she stressed the pros of swimming in a pool that it will make them relax, enjoy, cooling off from the heat, family bond and cohesion. She also highlighted few cons of swimming in a pool as cost effective, insect bites and infectious diseases (such as *Cryptosporidiosis*, *Giardiasis*, *Escherichia coli*, Shigella, *Norovirus*, *Legionellosis*) from the pool if the water is not treated/disinfected properly.

The future of the Blue Economy depends on our ability to balance the need for economic development with the protection of our oceans and the well-being of individuals who depend on them; by embracing sustainable practices and promoting responsible activities like swimming and recreational fisheries, we can ensure a healthy and prosperous future for the Blue Economy and all who rely on it. Swimming is therapeutic and we need to make it a daily routine practice for our well-being.

RECOMMENDATIONS

- Encourage swimming education and awareness programmes to promote water safety, swimming skills, and health literacy among individuals of all ages and backgrounds.
- Invest in the development and maintenance of aquatic facilities, including public pools, beaches, and waterfront areas, to facilitate access to swimming opportunities for communities.
- Support initiatives that promote sustainable recreational fishing practices, habitat conservation, and marine biodiversity protection through swimming-related activities and citizen science collaborations.
- Foster partnerships between government agencies, private sector entities, non-profit organizations, and community groups to maximize the economic potential of swimming within the blue economy while ensuring environmental sustainability and social equity.

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