

The effects on health and wellbeing of recreational activities at sea: the case of Cap de Creus marine protected area

This project was financed by a MedPAN Small project
(Mava Foundation and Prince Albert II of Monaco Foundation)
and the Oceans and Human Health Chair

This project was carried out by the University of Girona – SeaHealth
Research Group and the Oceans & Human Health Chair

For more information: www.oceanshealth.udg.edu

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Acknowledgements

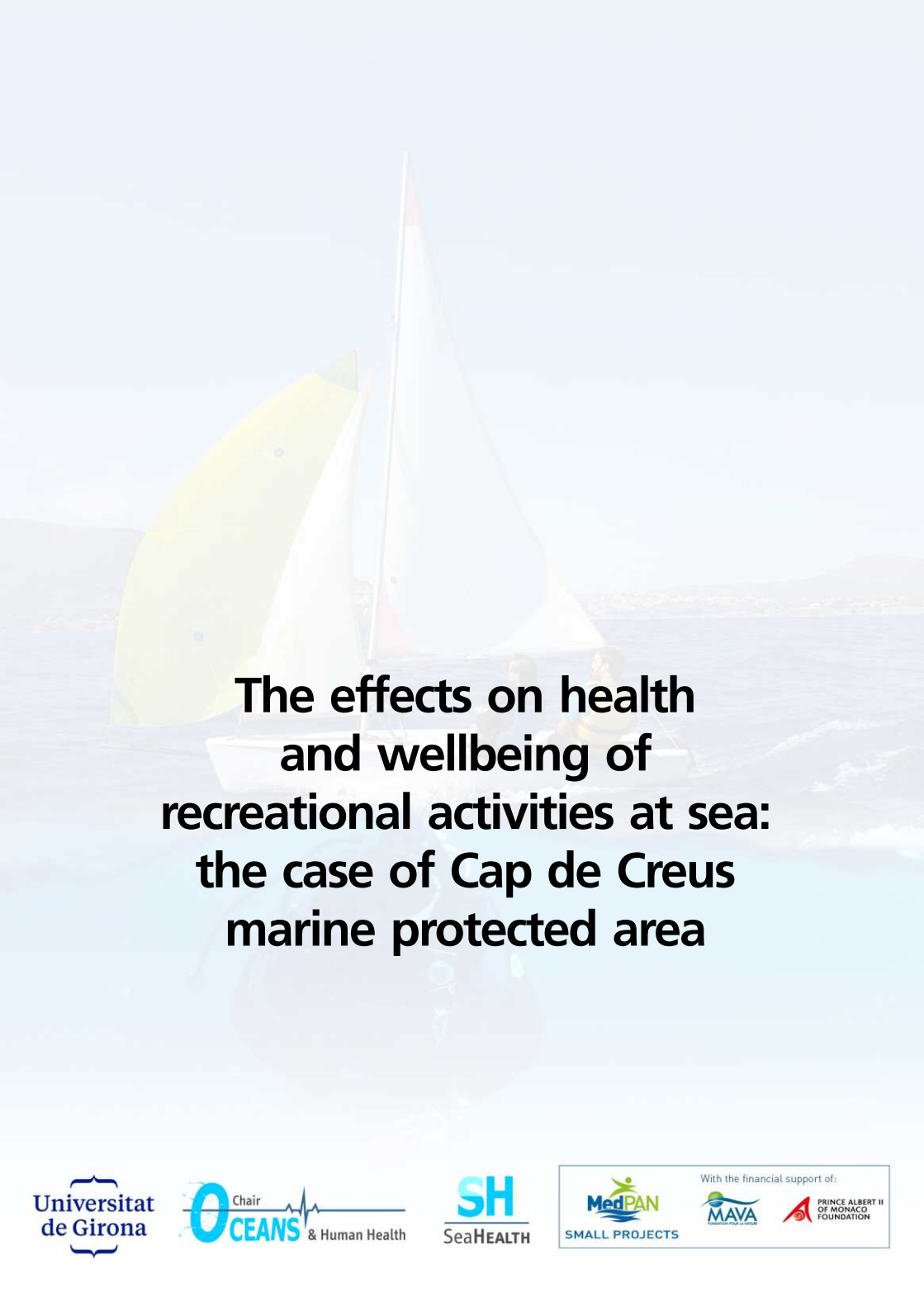
The authors thank all companies and entities that have collaborated in the project

Photos

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1. BACKGROUND

Over the last few decades, marine protected areas (MPAs) have been established throughout the world in order to protect species and their habitats from a range of activities that threaten the diversity, productivity and overall health of the marine environment. It is well known that MPAs promote sustainable fishing and maritime tourism activities, as well as engaging and educating the community on marine conservation issues. MPAs help to preserve a wide range of ecosystem goods, from species of fish rich in omega-3 fatty acids, to marine species with bioactive potential (new sources of medicines), together with services that include regulating or supporting services (e.g. primary production, shoreline protection and nutrient cycling) and cultural services (e.g. aesthetics and intellectual stimulation).

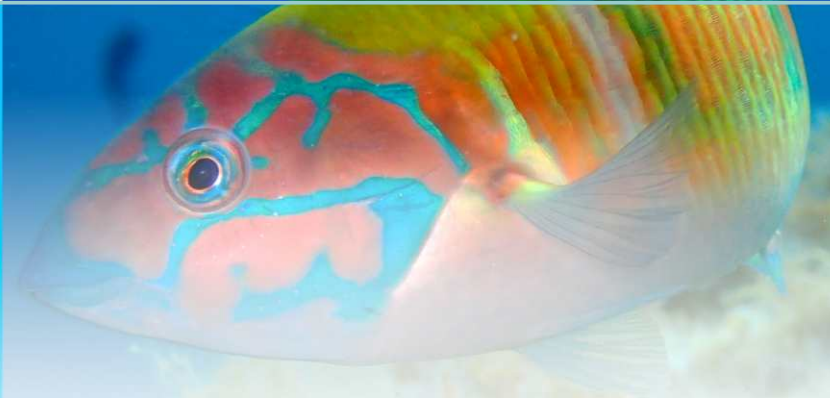
A growing body of evidence indicates that the marine environment is inextricably linked to human health. These complex linkages encompass both a range of potential benefits and opportunities, as well as risks to health and well-being. The relationship between the oceans and human health is further complicated because the marine environment is under increasing pressure from human activities such as fishing and tourism, along with the growing impact of global climate change. Until now, these relationships have been little studied in MPAs. Crucially, evaluating and managing these impacts on both the marine ecosystems themselves, as

well as human health and well-being, have largely been undertaken as separate activities under the auspices of various disciplines with no obvious interactions. “Oceans and Human Health” (OHH) is a relatively new and integrative meta-discipline in science. It has been set up to address complex issues around the interface between marine environmental health and human health, and does this by harnessing multidisciplinary expertise across the natural, social and economic sciences, including public health and medicine.

Although the EU Blue Growth Strategy has emphasized policies on economic development within the EU, it still pays little attention to sustainability and health and well-being. A greater emphasis is therefore needed in these areas to strengthen the interconnections between the environment and human health, and foster measures to promote truly sustainable growth for both people and ecosystems within the context of the EU Blue Growth Strategy.

In this context, marine recreational activities in MPAs, such as scuba diving, recreational fishing or yachting, may offer people a number of health benefits. Encouraging people to engage with the natural environment encourages greater physical activity, improves mental health, reduces propensity towards disease and increases life expectancy. However, until now, research has mainly focused on “green spaces” (woodlands, countryside, urban parks) and very little is known about the potential public health benefits of marine and other aquatic “blue space” environments. Recent studies indicate that marine recreational activities and visits to the coast elicit greater health and well-being benefits compared to urban parks and open countryside. In this sense, there is a global need to study how MPAs could play a significant role in promoting human health and well-being.

2- ABOUT THIS PROJECT



This project contributes to the global need to study how marine recreational activities conducted in MPAs could play a significant role in promoting human health and well-being. The project was carried out in the marine protected area of Cap de Creus (north-western Mediterranean, Catalonia, Spain).

The project aims to:

- *bridge the gap in current knowledge on the complex links between marine recreational activities in Cap de Creus and human health and well-being.*
- *increase awareness among stakeholders (MPA managers, inhabitants, tourists, and local businesses) of the existing relationships between marine recreational activities taking place in the MPA, and human health and well-being of citizens.*
- *engage stakeholders in taking action to promote sustainability and improve citizens' health and well-being in a way that not only supports the development of sustainable fishing and the tourism industry in the MPA, but also safeguards people's health and well-being.*

This project summarizes evidence of the benefits of different maritime recreational activities on human health and well-being. The conclusions drawn are based on published studies and the personal experience of professional, experienced instructors in the area of Cape Creus in response to open-ended questionnaires.

The questions were as follows:

Q.1 In your opinion, what parts of the body are exercised through doing your activity? (arms, back, legs, etc.)

Q2. What aspects of mental health and well-being are involved in your activity?(relaxation, sensation of freedom, etc.?)

Q3. Have you ever had clients who are ill (disability-type physical illness, cancer, obesity, cardiovascular problems, etc.) and who have noticed any improvement in their illness after doing the activity? Please specify the disease and improvement.

Q.4 Have you ever worked with clients who suffer from a neurological disorder such as Parkinson's and Alzheimer's disease or mood disorder such as depression? Have you noticed any improvement in their condition after doing the activity? Please explain the type of condition and improvement.

Q5. Have you ever worked with clients who have undergone medical treatment (chemotherapy or otherwise) or surgery, and who have noticed an improvement after doing the activity at sea?

Q6. Have you worked with healthy customers who have commented on an improvement in their physical or mental health after doing the activity?

Q.7 Does your institution / company / association / club, etc. organize activities for clubs or associations for people with disabilities? What kind of entity is it? What activity do you do? Have you received comments regarding the activity, and whether it improves health? Do you know anybody who does this kind of activity?

Q.8 Does your company / association / club, etc. do activities for groups of seniors (over 65)? Have they commented on how the activity improves their health?

Q.9. Would you be willing to help collect data, or opinions / experiences, for future studies?

The questionnaires provided first-hand information from experienced professionals on the potential links between maritime recreational activities and health and wellbeing.

Finally, the project gathers the available information regarding the interest of society in the maritime recreational activities as healthy activities by searching the publications that appeared in several newspapers and websites.



3- SWIMMING



Swimming indoors or outdoors is one of the best water activities to suit all age groups and most (but not all) levels of physical fitness. It is also considered to be low risk and not stressful. Whether part of a regular training programme or a leisure activity, swimming is beneficial to our health and well-being. Scientific evidence of the positive effects of swimming is based on numerous studies and articles on the relationship between swimming and human health and wellbeing, and is summarised here. However, the majority of these studies only focus on indoor swimming, and very few have analysed the effects of swimming outdoors in the sea. Therefore, further research is needed on the ways in which open water swimming in sea waters affects both physical and mental health and well-being.

This overview summarizes evidence of the benefits of swimming and water exercise on human health and well-being, and more specifically the effects of open water swimming on physical and mental health. The conclusions drawn are based on published studies and the personal experience of professional, experienced open water swimming instructors in response to an open-ended questionnaire.

A significant number of studies confirm the benefits of swimming for physical and mental health and well-being. An aquatic environment makes swimming and water exercise very accessible to any age group, and almost

any type of medical condition, as it is not weight-bearing and any possible risk of injury is kept to a minimum. However, very few of these studies analyse the effects of open water sea swimming and the effects of the environment of the sea itself on human health and well-being, and further investigation is needed to gain deeper insights.

3.1. Mental health

The analysis shows that swimming and water exercise can be beneficial for our health and well-being as it helps reduce symptoms of tension and anxiety caused by everyday stress, and symptoms of mental illnesses such as depression. The qualities of water act like a tonic on the nervous system, and swimming soothes the mind, reduces anxiety, and relaxes the body. As a socially and gender inclusive sport, swimming offers a good opportunity to make social contacts founded on, and promoting, a healthy lifestyle. It improves autistic children's ability to adapt, and facilitates language development and self-awareness. It also provides an appropriate setting for early educational intervention. Non-scientific studies suggest that open water swimming can be very beneficial and helpful for people in recovery from drug and alcohol addiction. However, studies so far are only based on the personal experiences of people who have had addictions or mental illness. Therefore, further medical research on open water swimming is urgently needed in order to find scientific proof of its benefits.

Results of interviews conducted with local professional swimming instructors working in the sea waters of the Cap de Creus Natural Park support the idea that swimming in the sea is very beneficial for mental health problems. Swimming fosters a strong sense of freedom, brings you into contact with nature and yourself, and it also improves concentration, coordination, and the ability to face fear and be alone. It gives a sense of peace, weightlessness, flow, revitalization, awareness and relaxation, and lowers physical barriers in cases of physical disabilities. Having to face the power of nature brings a feeling of self-confidence and sense of belonging to a special community.

3.2. Physical health

Swimming is one of the most recommended sports for practically all levels of physical fitness. There is evidence that exercise in water, as opposed to land-based exercises, has a positive outcome for people with cardiovascular disease, especially respiratory muscle strength and pulmonary function in healthy individuals. It also has therapeutic effects such as improving lung function and cardiorespiratory fitness in cases of asthma and COPD. It improves a wide range of musculoskeletal conditions, relieves pain, and



reduces abdomen pain in pregnant women. Water exercise improves balance in the elderly and people with neurological and neurodegenerative conditions. It also helps strengthen bones in cases of postmenopausal osteoporosis. Swimming exercises improve muscular strength and build stamina, flexibility, and cardiovascular endurance, as well as helping maintain a healthy body weight by lowering incidences of obesity. Some studies suggest that swimming in cold sea water reduces obesity and promotes a healthy lifestyle, and there is a hypothesis that in cases of surgical treatment, swimming in cold water may enhance postoperative recovery and reduce pre-operative complications.

The Cap de Creus swimming instructors interviewed observe that swimming in the sea generally improves aerobic strength, coordination and

stamina. It also enables a complete body work out with minimum physical stress on muscles. The majority of instructors notice a range of improvements in swimmers: increased muscle strength and endurance, better lung capacity, better regulated body weight, improved mobility, muscle development, better body posture and improved cardiovascular function. The interviewees verify an overall improvement in cases of swimmers with missing limbs, or limited mobility, and confirm it is beneficial for both post-traumatic stress disorder and overcoming the side effects of chemotherapy.

However, to date, very few scientific studies supporting these observations have been undertaken, and research on the effects of sea swimming on people's health is lacking. This indicates a need to understand the various perceptions that exist among swimmers. Even though this report is primarily based on scientific studies and trusted sources, it lacks data. Therefore, further medical investigation needs to be carried out in order to observe the full impact of swimming at sea, and determine what specific ways people can benefit from it.



4- FREEDIVING & SCUBA DIVING



In this overview we have summarized evidence on the benefits of scuba diving and freediving (including spear fishing) on physical and mental health. The conclusions derived are based on existing scientific studies, evidence from websites and the personal experience of professional, experienced scuba and freediving instructors, shared through an open-ended questionnaire. Although several webpages emphasize that the practice of freediving and scuba diving is beneficial for health and well-being, scientific literature on this is scarce.

4.1. Mental health

Free divers frequently emphasize the mental dimension of their sport, which has two interconnected aspects: first, mental control, which creates a body-mind that reacts as it has been trained to; and second, a meditative state of mind. Hence, freediving is not only an encounter with water, but the diver also dives into themselves in a mindful experience. One of the best examples of the physical and psychological effects of scuba diving is derived from people suffering from physical disabilities. People with disabilities who scuba dive indicate it brings them a positive psychological and social benefits. They form new friendships and develop a close trust-based relationship with their companions, as the diving buddy system means they

have to be mutually reliant whilst underwater. Many divers also experience a salutogenic effect, described as a state of well-being felt immediately after diving. Other studies found that scuba divers experienced a lower perceived level of stress, linked to an increase in well-being and also a decreased negative mood in terms of tension-anxiety, depression, anger, and confusion. Furthermore, military veterans who have experienced life-changing injuries reported an overall improvement in psychosocial well-being scores after scuba diving therapy, most notably relating to a decrease on their anxiety levels, insomnia and depression. From a psychological point of view, an analysis of scuba diving suggests that the salutogenic effect stems from experiencing a state of full consciousness and openness associated with slow, deep breathing. According to studies, these psychological characteristics are similar to those developed during meditation, suggesting that scuba diving could have a similar effect to meditation, in that it induces a state of mindfulness.

4.2. Physical health

Historically, scuba diving has been associated with the fit and able-bodied. However, several studies have demonstrated that the feeling of weightlessness makes it a manageable challenge for people with physical injuries. Studies have shown that divers with different physical disabilities were able to move better when diving than when on land, and they enjoyed the new physical and psychological challenge of scuba diving. At a more physiological level, it has also been postulated that scuba diving could be beneficial as a therapy, as it alters blood gases such as oxygen and nitrogen when diving at a certain pressure. This is particularly important for divers with limb amputations, and have a higher risk of poor blood circulation.

Many people around the world, of all ages and backgrounds are passionate about scuba diving and freediving. Apart from scientific evidence, several websites also promote these as healthy underwater activities. They suggest that diving benefits mental and physical health, and the collective opinion of many divers is that diving is “relaxing”. From a physical point of view,

many websites state that scuba and freediving are a good way to burn calories and train several parts of the body (core, back muscles and glutes) because of the natural resistance of the water. From a psychological point of view, many parallelisms are made between diving and a meditative state, enabling divers to obtain a calm, relaxing state of mind. Divers have to focus on respiration and the present moment – both key aspects of meditation. Thus, in the same way as meditation, diving is thought decrease anxiety and stress, and improve attention span, self-awareness, and sleep.

Finally, the questionnaires posed to free and scuba divers during the project have provided first-hand perceptions of these experienced professional swimmers on the potential links between diving activities and health and well-being, and that needs further research in the future with experimental studies. All those interviewed agree that these activities benefit the physical condition of human body as well as well-being, and one of the major benefits of diving activities is relaxation. They particularly report benefits for people with mental illness and physical disabilities, including tetraplegia, and improved mood in people being treated for illnesses such as cancer.



5- KAYAKING



This study aimed to evidence the positive effects of sea kayaking on human health and wellbeing. Information from both scientific and non-scientific sources was collected, and interviews conducted with professional kayaking guides at Cap de Creus Natural Park. To date, few studies have focused directly on the positive effects of kayaking on human health and wellbeing. Even less attention has been given to the particular psychological benefits of sea kayaking, despite evidence from non-scientific sources and interviews that indicate it is beneficial for psychological wellbeing.

5.1. Mental health

Regarding mental health, a study stated that kayaking is a basic and significant source of pleasure for everyone. This suggests that kayaking is in some way a "fun" experience for all, regardless of physical limitations. However, there is a lack of studies on psychological wellbeing associated with kayaking, and further research is needed. More recent studies have focused on the benefits of kayaking for the psychological health of people with spinal cord injuries. Results of the study reveal that, first and foremost, kayaking provides a sense of relaxation and peace. It is a way to create new social connections based on new experiences, enabling participants to

overcome their fears, and bringing a sense of self-confidence and motivation to keep going. Kayaking is an effective way to turn the focus away from problems, such as injuries or disabilities, and towards to a new activity which gives individuals a sense of moving on to something that is possible, despite their limitations. In effect, limitations are left behind, and thus, their importance diminished. Findings from the study also show that feeling good about kayaking, and being successful at it, rebuilds self-esteem and self-confidence. This alone motivates people to continue to be active and lead a healthy lifestyle. The study participants emphasized the importance of non-traditional rehabilitation such as kayaking and other outdoor activities, as "One of the best things about kayaking may be that it takes the wheelchair out of the activity". A unique advantage of this sport is that the rocking motion of the kayak on the water provides the paddler with simultaneous vestibular stimulation on numerous planes, whether healthy or injured.

The majority of non-scientific sources emphasize the psychological benefits of kayaking. The information reviewed supports the idea that sea kayaking improves mental health and lowers stress levels. As it is an inclusive, low-impact activity, kayaking offers people with disabilities the opportunity to paddle together with people with no physical limitations. There is also no age limit so it is easier for people of different ages, and from different backgrounds, to meet and socialise, and this raises self-confidence. A number of websites point out that being out in the open water has a very meditative effect. Paddling combines physical activity and the tranquillity of floating on water, thus reducing stress.

In the interviews conducted with professional guides, all the guides strongly agreed that sea kayaking produces a very strong sense of freedom, self-connection, contact with nature and the sea, and relaxation. Kayaking provides an opportunity for new experiences and environments, and allows the kayaker to disconnect from the routine of daily life. Sea kayaking can bring many contrasting sensations and experiences. For example, on days with good weather, it brings a sense of calm, tranquillity and silence. In

contrast, when the sea is rough, the associated adrenaline rush brings intense feelings, a respect for nature, and even fear. In all cases, it brings a sense of freedom and autonomy. For children it is exciting, and for adults, a way to find peace, relaxation, contemplation, and connection with nature; an exciting activity that positively affects self-esteem.

5.2. Physical health

Regarding physical health, many studies have researched the possible negative effects of kayaking, including injuries and physiological changes. However, very few have looked at the possible benefits of sea kayaking on physical health. The few existing works provide clear evidence that kayaking is an outdoor activity that can be enjoyed with easy motions and with minimal skill, and that can be done equally by both the able-bodied and those with disabilities. Kayaking is very demanding on the body, and challenges the balance control system. Studies show that kayak training programs are highly effective in improving the muscle strength of the upper




limbs, handgrip strength and balance in both the sitting and standing postures of community-dwelling elderly people. In cases of people with spinal cord injuries, or related disabilities, evidence suggests that kayak training leads to increased shoulder muscle strength and postural stability. In both cases, the results were obtained using a 3-D virtual reality kayak program and kayak ergometer training. Thus, further work could be carried out to establish differences between these methods, and the impacts of a similar program carried out at sea.

Non-scientific sources of information (i.e. opinions of non-professional inexperienced kayakers) indicate that sea kayaking has numerous health benefits. According to the articles cited, sea kayaking improves aerobic fitness, builds strength and improves flexibility. Paddling is an inclusive, low-impact activity, and so offers opportunities for people with disabilities to do sport alongside healthy people. There is a much lower risk of wear and tear on joints, and there is no age limit. It helps develop core strength, which on its own improves balance.

Responses from kayaking instructors who participated in the interviews support the conclusions drawn from the literature. Their observations and professional knowledge indicate that people exercise their arms, back and abdominals when paddling. Once the kayaker is experienced and has improved their paddling technique, they get more complete body work out. This includes legs, toes, and the whole upper part of the trunk, and the back, lumbar, pectoral, large dorsal, inferior, trapezoidal, and abdominal muscles. By practising and improving their technique, people also improve their general balance and posture.

Overall, the results from the study, and opinions of both kayakers in Cap de Creus and the many communities of sea kayakers around the world, support the hypothesis that sea kayaking is beneficial for human health and wellbeing. Nevertheless, the results of the study are insufficient to draw general conclusions. Many questions have been raised, and this points to the need to carry out further research on the topic.

6- SAILING



The wide variety of sailing sports includes yachting, dinghy sailing¹, windsurfing and kitesurfing. The conclusion summarizes evidence of the possible benefits of dinghy and other types of sailing on the physical and mental health of people of different ages with various health conditions. Conclusions are drawn from (i) a review of the existing literature, which is scarce, (ii) information gathered from specialized sailing websites where sailors share their perceptions about health benefits of sailing, and (iii) the knowledge of experienced sailing instructors who have been sailing and teaching dinghy courses to beginners at Cap de Creus Natural Park for over 10 years. Seven sailing instructors answered nine open-ended questions regarding their perceptions of the potential effects of sailing on people's health and well-being. Both healthy people and those with various medical conditions were taken into account.

The questionnaires provided first-hand information from experienced professionals on the potential links between sailing at sea and health and wellbeing. It is commonly thought that sailing is a highly favourable activity for the wellbeing of both the able-bodied and those with physical disabilities or mental illness. However, further investigation is needed to understand the true benefits of sailing for health and wellbeing. The few

(1) Dinghy sailing is the activity of sailing small boats using various skills and techniques.

scientific studies published reveal that the quality of life of both healthy people and patients with various medical conditions, which have both physical aspects (including pain) and mental/emotional/psychological aspects, improve after a sailing course. However, these studies have thrown up many questions in need of further research.

6.1 Mental health

The literature reviewed demonstrates that sailing benefits people's mental health. It seems that the aquatic environment acts as stimuli for perception and integration, and improves people's quality of life by increasing their self-esteem and general health. Studies also suggest that sailing is vital for rehabilitating people with disabilities². Increased general life quality of disabled children and adolescents who sail has also been proven. Results from the studies reviewed suggest that sailing has a positive impact on the general functioning and quality of life of patients diagnosed with severe mental illnesses, and that it improves their health. Evidence supports the idea that a rehabilitation program based on learning how to sail may motivate patients with mental illnesses or disorders and make standard rehabilitation procedures more effective. Sailing together with a crew significantly improves social functioning in people with severe psychosocial disabilities, compared to more traditional group psychosocial rehabilitation activities.

Studies suggest that dinghy sailing is particularly beneficial for the physiological health of children. Participating in sailing helps develop confidence and competence, and other key personal and interpersonal skills such as social interaction, problem-solving, decision-making, planning, concentration, resilience, communication, and leadership.

(2) According to the Disability Services Act (1993), a disability is any continuing condition attributable to an intellectual, psychiatric, cognitive, neurological, sensory or physical impairment, or a combination of those impairments which results in substantially reduced capacity of the person for communication, social interaction, learning or mobility and a need for continuing support services.

According to the information on various specialized sailing websites, there is the perception among practitioners that dinghy sailing lowers stress levels and brings peace of mind and evokes calm. Sailing improves agility and concentration, and also enhances a person's coping skills, and ability to deal with multiple tasks simultaneously. The websites also report that sailing can help people learn how to communicate effectively, and combat addictions and anxiety. From personal experience, some sailors indicate that sailing can be highly therapeutic for treating both physical and mental health problems.

According to information gathered from interviews with sailing instructors at Cap de Creus Natural Park using an open-ended questionnaire, sailing requires concentration and helps build emotional balance. It enables people to connect with nature, and helps develop communication and collaboration skills in a creative and natural way. It brings a feeling of freedom, a sense of disconnection, self-control, reflection, and brings people into contact with nature. Sailing appears to stimulate people's concentration as it is a complex and attention absorbing activity which makes people disconnect from the rest of the world. The instructors interviewed believe that sailing brings feelings of high satisfaction and a knowledge of the natural environment. Furthermore, sailing brings health benefits to children suffering from disorders such as attention deficit disorder (ADD) and Down's syndrome, and older people with Parkinson's disease.

6.2. Physical health

Few studies have been published on adaptive sailing or the positive effects of dinghy sailing on physical health. A case study suggests that independent sailing for people with tetraplegia can potentially improve mobility, mood, social role functions, control over injury, feelings of depression, community reintegration, resilience, and access to natural environments. Another study carried out on children and young people with a variety of disabilities reports significant improvement in trunk

stability and improvement in the quality of life after the sailing course. The whole program, including the virtual/technological program and sailing courses, improved not only physical aspects (including pain), but also mental/emotional/psychological aspects of illnesses. It seems that sailing improves the overall physical and social well-being of disabled children and adolescents, and could be used as an integral part of their rehabilitation program.

Opinions on specialized websites point out that sailing improves muscle strength and endurance, as well as cardiovascular health as it reduces the risk of obesity, hypertension, and other heart conditions. It also helps improve flexibility, agility and concentration, and enhances a person's ability to concentrate.

The perceptions of the sailing instructors interviewed complement, and partly coincide with, the results found in scientific literature and opinions



on specialized websites. Sailing instructors' answers to the questionnaire reveal that dinghy sailing engages the whole body, develops balance and agility, as well as improving explosive force and building long-term resistance. The muscles of the whole body are in action, particularly legs, abdominals and arms. Sailing at competition level enhances skills related to precision and perfectionism, and improves general mobility and coordination.

Despite these results, the full range of effects of dinghy sailing at sea are not fully understood. Many questions remain unanswered, and further research is needed to provide insights into this matter.

7- SURFING, WINDSURFING AND STAND UP PADDLE (SUP)



This overview is a collective summary of the evidence on the possible benefits of surfing, windsurfing and stand up paddle (SUP) on people's physical and mental health. Conclusions are drawn from three information sources: 1) existing scientific studies; 2) information from specialized sport websites, where users voice their perceptions of health in relation to these recreational activities; and 3) knowledge from the personal experiences of 5 experienced surfing instructors in the Cape Creus area obtained through an open ended questionnaire.



To date, there are few academic studies investigating the relationship between surfing, windsurfing and stand up paddle boarding and human physical and mental health and wellbeing. In the study area selected (Cap de Creus Natural Park), surfing is less popular than windsurfing and SUP. However, bearing in mind that both windsurfing and SUP originate from surfing, and the limited research on the benefits of these sports, we have made parallels between these activities, and suggested possible benefits common to all three sports. It is generally thought that these sports exercise both body and mind and can be made accessible to people with disabilities and/or those suffering from mental illness. However, further investigation is needed in order to better define the precise positive impacts.

7.1. Mental health

Based on the scientific information reviewed, we suggest that surfing, windsurfing and stand up paddle boarding benefits mental health. Surfing appears to have a positive impact in several areas: self-knowledge, exploration, effort and perseverance, problem-solving, time management, group competencies, interpersonal relationships, and emotional regulation.

The findings of several studies point to using surfing as a psychotherapeutic intervention tool which could encourage a healthy lifestyle, wellbeing, and personal and social skills in young people in situations of psychosocial vulnerability. In contrast, no similar studies on the psychological benefits of windsurfing were found.

Opinions of expert practitioners on specialized online websites point out that surf sports benefit mental health. All three sports require a very high level of concentration in order to achieve good coordination, concentration, maintain balance, and stay safe. This level of concentration helps those practicing the sport to relax, disconnect from everyday problems and reconnect with themselves. SUP can be easily combined with

meditation or yoga as it does not require any specific weather conditions (unlike windsurfing or surfing) and can be done on calm sea.

From the knowledge, experience and perceptions of surfing instructors interviewed in Cap de Creus, we can highlight that these sports require full concentration, therefore, they help improve general mental and emotional wellbeing. These sports enable people to connect with nature, they bring a feeling of freedom, of switching off, and of self-control. The natural environment and dedication required in these sports makes them both challenging and adrenaline releasing, provoking feelings of great satisfaction and a deep appreciation for the natural environment.



7.2. Physical health

Adapted surfing can be used as a therapeutic tool for physical rehabilitation, especially in the fields of orthopedics and neurology. The environment is stimulating and this also has numerous therapeutic benefits. Adapted surfing helps improve balance and motor coordination,

and in cases of specific physical or mental health conditions, it encourages patients to be more autonomous in their daily lives.

The majority of studies investigating links between windsurfing and human health focus on physical injuries or other problems related to windsurfing; no studies were found on the possible benefits of the sport. As windsurfing originates from surfing, future areas of exploration and research questions could base future studies on the benefits of surfing, and use this as a foundation for finding correlations between the two sports.

Stand up paddle boarding also originates from surfing, and is an enjoyable alternative to more traditional water sports. Data suggests it is an excellent aerobic and anaerobic exercise, improves multi-directional trunk endurance, aids weight loss, and improves fitness. It also improves general quality of life, especially in social relationship and environment domains. Trunk muscle endurance improved in every way in the tests performed in this study.

According to specialized sports websites, there is a perception that all three sports under study share the same benefits for our physical health. All the main muscle groups (back, arms, legs and abdominal muscles) are



exercised, and learning how to balance on the board builds 'core stability' by engaging the deep postural muscles; thus strengthening them. These sports are excellent calorie burning cardiovascular exercises, and therefore help fight against obesity. These sports also improve joint flexibility. SUP can be considered a low impact sports activity and easier to adapt to as it does not require wind or wave conditions (unlike the other two sports), and can be done in calm water as well.

The Cap de Creus instructors interviewed for this study suggest that surf sports exercise muscles in the whole body, as well as improving physical balance, agility, strength, and long-term resistance. Although muscles in the whole body are working, the sport mainly exercises the legs, abdominal and arms, as well as improving concentration and coordination.

The lack of available information makes it difficult to come to firm conclusions on how precisely surfing, windsurfing and stand up paddle boarding positively affect our health and wellbeing. Many questions are raised, and the available data is scarce and disperse. Therefore, further medical research is needed in order to investigate the full impact of surf sports on health and wellbeing.





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