

**ALTERNATIVE LEISURE SPORTS PRACTICES – AQUA
FITNESS**
■ **conceptual delimitations** ■

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Key words: Aqua fitness, alternative exercises, conceptual know-how.

Abstract: The extremely rapid evolution of alternative fitness forms is no longer a surprise for experts in the field or for the public. In fact, the consumption tendencies of leisure, the ever sophisticated tastes of the population, and the fast out of fashion of the old-new forms of fitness, the monotony and of already known exercises are among the reasons for seeking new forms to involve the population in the sport for health.

This paper aims at being a chance or a second chance for physical activities in the aquatic environment besides swimming. Within the paper we included several aspects regarding the specifics of this leisure activity, a brief analysis of the dynamics of the bio-physiological changes induces by this type of exercises, as well as a systematization of the practice forms hiding behind the generic name of **aqua fitness**.

Introduction

The fitness field is still a controversial one. The disputes do not concern only the experts. The public has its own opinions. They are not interested in the more or less sterile disputes among experts, but they will take advantage of the results. Sometimes the scientific community forgets about experts' duty – the need to offer a more useful and attractive product to the society, with all its members benefiting from it as fast, effectively and largely as possible.

This scientific project aims at building an identity of the “aqua fitness” sports service, in order to find an adequate place on the demand market. The offer on the sports services market for leisure is extremely diversified. Choosing the best leisure activity is more difficult for most of the people because of the information boom (often either without a scientific ground or insufficiently presented). There are many confusions and lies in the offer on this market. People cannot find a credible piece of information to rely on, to make sure they made the right choice.

In this sense, the scientific product presented below is part of a triad structured in three phases: *the first phase* is represented by this

article and it deals with the conceptually-oriented aspects of aqua fitness; *the second phase* will be reserved to an analysis meant to identify the problems specific to the teaching-learning activity of water physical exercises; this effort will end with the *third phase*, an experimental project having as objective evaluating the effects of aqua fitness upon various categories of the population and a comparative analysis with similar activities.

Particular aspects of the aqua fitness activity

Aqua fitness may be defined as a particular form of using the working principles and the action systems offered by classic cardio fitness and adapted to the specifics of physical effort in total or partial water immersion.

The first timid attempts took place in the late 80s in the United States of America. Here we talked for the first time of using the pool in another purpose besides swimming. This alternative and visionary idea brought on new opportunities regarding the health-oriented and therapeutic dimension of water physical exercise.

Aquatic exercises were used at the beginning as recovery means for injured athletes. Experts in sports medicine discovered that floating in water, as well as water resistance and therapeutic massage contribute to a more rapid recovery process. Because of the curative properties of aqua fitness, athletes often choose water gymnastic exercises. Water exercises cover athletes' need to avoid accidents or to recover faster after effort, and aqua fitness is the bonus in this case.

Aqua fitness is a good method to practice without negative effects upon the joints and the tendons, induced by the impact with tough surfaces (ex: the floor of the classic aerobic room). The clear advantage of water training over that of the typical aerobic resistance (jogging, running, cardio aerobic) is reducing the risk of injuries, a longer active sporting life and maintaining the wellness indices at least at the same level with the rival activities. Another advantage is that of force augmentation. Water resistance being much higher than that of air (literature shows a 12 times higher value), the aquatic exercises use several muscle groups, soliciting them more intensely. This assertion is supported by the fact that the instable environment of the exercises requires the force of many muscle groups in order to maintain the balance under water. The constant pressure of the water all over the body, its controlled temperature and the load supported by the bone system, reaching up to 25% of the body on land represent facilitating agents of improving the mobility and the versatility. In order to maintain

an optimal flexibility level and to increase the movement degree of joints, water stretching proves to be a superior method. Unlike land exercises, water favours the thermoregulation process. Heart beats are reduced with up to 10 beats per minute in comparison to land exercises. This direct effect of effort intensity does not mean that the body is less solicited. Studies show that aqua fitness stimulates the heart and cardio-vascular system sufficiently, as the heart pumps 10% more blood during a contraction (beats) when the body is immersed into the water, in comparison to the heart beats of a trained athlete.

Bio-functional and motor aspects

The dynamics of functional alterations of heart activity

It is vital to talk about the response of the heart to the aquatic environment. Expert studies have shown that the response of heart beat to water considerably depends upon water temperature (Avellini, Shapiro, & Pandolf, 1983). Virtually, exercise in 25°C water determines a more reduced response than the land one, at certain oxygen consumption. If the water reaches 30-35°C there isn't much difference comparing to land exercises (Craig & Dvorak, 1969). Moreover, the hydrostatic effect of the water determines a change in the blood quantity from the periphery towards the thorax (Arborelius, Balldin, Lilja, & Lundgren, 1972). This leads to an increase in the central vein pressure, in the volume of heart attacks, resulting in a reduction of the heart rate. This is emphasized in chest-level water. The influence of water temperature, combined with the hydrostatic pressure, helps us see why, with a predetermined level of VO₂, heart rate has values with 20 bpm lower than in the case of land exercises (Mougios & Deligiannis, 1993).

Practice intensity is an essential factor for the progress of cardiovascular maintenance for land exercises. During water exercises, intensity seems to be the most important factor for cardio-vascular improvement, first of all due to the different circulatory responses to water immersion versus land training. Many of the studies showing insignificant reductions of VO₂max after water exercises are the direct result of underestimating heart beat when the body exercises under water (Eyestone et al., 1993; Quinn et al., 1994; Seefeldt & Abraham, 1996). Researches showing very high heart rates (70-85% of the maximal heart rate) during training led to progresses in the cardio-vascular fitness. This high exercise intensity may be necessary to counterbalance the effects of the hydrostatic pressure which reduces heart rate when the water reaches or surpasses the chest level.

The heart response to water exercises depends mostly of water depth, its temperature, as well as the training intensity. The effects of water exercises upon reducing heart rate were registered by two researchers who showed that heart rate during relaxation decreases after regular aerobic water exercises. Hoeger et al. (1992), and also Simpson and Lemon (1995) noticed reductions of the heart rate during relaxation of 7 bpm and 11 bpm, respectively. These values are similar to those reported after land trainings.

It is well-known that hydrostatic pressure exerts a 76 mmHg pressure with every meter under water. Water facilitates the blood returning to the heart, thus reducing the “work” of the cardiovascular system. Moreover, putting one’s head into the water will reduce the heart rate (common facial reflex for many mammals).

Thus, during effort under water a subject’s heart rate may decrease by 10-12 beats/min than during land training.

Nonetheless, the cardiac response is still under research as the cardiovascular response depends upon several factors. Heart rate varies as follows:

- it decreases (by 3-17 b/min) when the subject in under water up to the basin or costal arch level, being explained by the following: the increase in the returning volume stimulates the DS and implicitly, the DC volume, leading to an increase in the TA – the baroreceptors’ response induces a decrease of the FC.
- it increases when the subject in under water up to the neck: receptors sensitive to myocardium stretching respond by accelerating FC because of the increasing central blood volume. This atrium reflex is called the Bainbridge reflex and it stimulates the circulation by maintaining the balance between the blood volume returned to the right atrium and that pumped in the left atrium.

Thus, the depth of the immersion (pelvis, costal arch or neck) influences the heart rate.

The dynamics of body composition

The positive effects of regular water exercises upon body composition are supported by the technical literature, the most important advantage being that of reducing the body fat percentage. The attempts to materialize changes regarding body fat after training in more or less deep water have come with different results. A major reason of this difference is the short training period, between 4 and 11 weeks. Researchers believe that we need at least 8 weeks to see the effects in most of the

physiological variables. This is true mostly for changes in the body structure, as diets are also very important in this case.

Quinn et al., Michaud et al. (1995) showed that after 8 weeks of water running, 10 untrained subjects began to reduce body fat. The subjects had trainings three times a week, for 8 weeks, at a 63-83% intensity of the FCM. Subsequent skin tests have shown a 2.6% reduction of body fat.

There have been major decreases during certain studies, taking into account the aerobic effort in low-depth water. After a 11 weeks program, with 3 trainings/week, 50 min each, with a group of sedentary female highschool students there was a 5.6% reduction body fat (Abraham et al., 1994). According to Abraham, Hoeger et al. (1992) noticed reductions of the body fat in case of sedentary women who trained 3 days a week, 20 minutes a day, at a 70-85% intensity, for 8 weeks. As the researches regarding the effects of regular water training, those regarding to body changes also have different results. Results vary from an increase by 4.7% to a decrease by 11.9% of body fat, the studies varying between 4 and 11 weeks. Four of the six studies registered a decrease of the body fat for trainings of this length (Abraham et al., 1994; Hoeger et al., 1992; Michaud et al., 1995; Sanders, 1993). This supports the opinion that the effects of training can be seen after 8 weeks or even more. Moreover, experiments without diets take longer to notice great changes of the body fat.

Muscle force

Enough researchers have examined the effects of water exercises upon muscle health. Water exercises in low-depth water are ideal to train the muscles for uninitiated people. Even though there are no special muscle exercises within the aquatic routine, there has been an increase in this parameter. In case of athletes, researches observed that after a 4 week training, the measurements showed great differences between people with a land training and those with low-depth water training.

The abovementioned conclusions indicate the fact that the resistance properties of the water may facilitate the muscle force development for the inactive participants and may help athletes maintain their physical form. These discoveries are promising mostly for adults. We need more thorough research of this subject before drawing final conclusions regarding the tonus and the inherent link with health.

Flexibility

Few studies have dealt with this neglected aspect of the link between fitness and health. A series of tests elaborated by various research groups show us a minimal progress or an insignificant

improvement of the mobility index. But this should not be discouraging. If the means are similar, but the effects are not, at least for the moment, proven to be scientifically superior for mobility improvement, then we should take into account the advantage of water training.

Current studies, even though not numerous, support the improvement of flexibility through low-depth and deep water exercises. Participants may use the water resistance in order to reduce joint stress and to gain flexibility. We need additional research with various flexibility tests, as well as trainings with various lengths.

Practice forms for aqua fitness exercises

Exercises for muscle improvement and resistance

Aquabuilding. Method developed by Lebaz in 1988; its objectives are muscle growth and progressive sculpting of the human body through water (based upon the resistance of movements in water). This resistance is connected to the speed of executing the movements, to joint positioning, to using portative objects with various surfaces in order to push the water, weights.

Aquagym. Program addressing a large category of subjects; it consists of analytical exercises adapted to the aquatic environment. The program applies individually or collectively for healthy people or for persons with certain disabilities. The exercises for the upper limbs and those for the legs are usually intercalated with exercises for the middle body part. The exercises are executed sitting on the margin of the pool or in diverse positions insuring the floating with or without an aiding device.

Cardiovascular exercises

Cardio-aquagym. Physical training method applied by Colado (1996), it requires a continual movement, combining walking on the bottom of the pool with other classic movement techniques. The body immerses up to the chest level or even more. Also, during the walking there are arm and leg movements, thus ensuring a greater solicitation and a more rapid calorie burn, because we use the big muscle groups

Aquawalking. This program consists of walking in the water, up to the chest level and pretty fast, in order to create the overload necessary for cardio-respiratory benefits. The steps should vary in order for all big muscle groups to be equally solicited.

Aquarunning. This activity was defined as a program very similar to Aqua-walking, but with jumping steps (Sova, 1993). The participants lift themselves partially while walking through the water. Here, too,

movements are forward, backward and lateral, with *kick*, *knee up* and *knee side* movements.

Combined exercises: cardiovascular force & resistance

AquaPower. It is a program conditionally combining cardio-aerobic with muscle tone exercises as part of the aerobic training (Piget, 1991).

Aquacycle or Aquaspinning. This form represents a combination of static cycling in the pool. This exercise is executed with special bikes, having multi-level positions (*aquabike*). We additionally use inflatable objects, membrane gloves, in order to increase the soliciting degree of the body and the number of muscle groups involved, together with the pedalling techniques.

Exercises soliciting the balance, postural control and joint mobility

Aquastretching. Para Cabello and Navacerrada (1997) – “it is the development of a set of techniques to stretch the muscles and to promote joint mobility in the water, benefiting from the massage qualities and the pressure of the environment, using as main method the stretching”. The techniques used are passive, active and PNF (proprioceptive neuromuscular facilitation).

Aquapilates. It is an adaptation of the action principles and systems specific to this method. The special conditions imposed by water characteristics (hydrostatic pressure, temperature, salinity level, subaquatic currents, etc) make the exercises easier to manage, amplifying at the same time the comfort degree of physical stress.

Coordination and rhythm exercises

Aquaerobic. This consists in a set of aquatic gymnastic exercises, adapted to the various needs of people, with a musical background (Pena, 1995). There are several objectives in this case: developing the body language and a sense of the rhythm, as well as assimilating the exercises, improving the aerobic physical capacity, the motor qualities and skill in the aquatic environment. The atmosphere is relaxed, in order to integrate all the participants, the general ambiance being completed by a great music to create a good mood. These exercises are used in more or less deep pools, but also in very deep pools for persons who want to improve their general mobility in the aquatic environment.

Aquastep. The step training covers the entire aerobic part of a program. The participants may use the stepper or the pool ladders. The vertical circulation against gravity and beating the water pressure create a set of exercises with variable intensity differently soliciting the various body parts.

Aqualatin. It is centred upon applying the techniques of coordinating Latin dance in the water, adapting the speed, versatility and fluidity of movements in water, as well as the postural control and the necessary balance. It is practiced in less deep water, usually in pairs.

Aqualudus. It is a program of collective pleasure in a 100% relaxed environment. The main purpose is group socialisation through movement, theme and skill games. It has variable depths, with or without aiding materials or objects. The group or pair work with displacements in various geometrical forms and different directions determines the dislocation of a great water volume, thus increasing the friction force.

Aquabox or Aquakombat. People go into the water up to their chests, with the legs stoutly trying to execute box, kary or kick box techniques. We are talking about maximal intensity training, underlying work, speed and power. These trainings may be coordinated on a tae-bo or free music, respecting the specifics of martial art trainings.

Conclusions

Aqua fitness is among the new practice tendencies regarding spending the leisure. The great mood, the comfort of the aquatic environment, the curative properties of the water, and the multidirectional advantages of efforts in the water are some of the various advantages of this practice. Reducing the mechanic stress upon the joints, tendons and the musculo-ligament system recommend it as an all-ages activity.

Moreover, these conclusions support the efficiency of aqua fitness for persons with special needs or in special situations. Pregnant women, older persons or with various functional disorders, structural deficiencies or complex disabilities may successfully participate to such a physical program.

Another therapeutic effect is sustained by the great massage of the water upon the tegument, as well as by the recovery of patients with arthrosis, arthritis or discopathy.

We believe that there is a link between using the muscle training programs in water and the body fat reduction. Muscle training on the aquatic environment is an effective means of improving the body composition by reducing body fat, benefiting both the body by training the great systems (the nervous, endocrine, and circulatory system) and the main body systems (the cardiovascular, respiratory, digestive and excretory system). The aquatic exercises don't just tone the muscles, help the recovery of joint mobility, stress reduction eliminating the lactic acid from the body, but they also work on the joints, and the body becomes

much more flexible, as water is a natural and instantly adjustable exercise device.

The aquatic environment can support up to 90% of the body weight, which leads to less injury risks. Working with the constant water resistance improves the general coordination, contributing to forming and maintaining a correct posture.

These conclusions are mainly theoretical, as they can only be partially proven through scientific experiments. Nonetheless, this cannot diminish the health potential and the importance of this activity in improving the quality of life.

In Romania the multidirectional effects of aqua fitness have not been fully researched yet. This material aims at being an impulse for future research programs oriented towards the identification and scientific homologation of the functional, motor, behavioural and social finalities obtained after adhering to an aqua fitness program.

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Titlu: Alternativa practicării sportului de agrement - Aqua fitness. Delimitări conceptuale.

Cuvinte cheie: Aqua fitness, exerciții alternative, conceptul de know-how.

Rezumat: Dezvoltarea extrem de rapidă a formelor alternative de fitness nu mai este o surpriză pentru experți sau public. De fapt, tendințele în consumul de petrecere a timpului liber, gusturile tot mai sofisticate ale populației și schimbarea rapidă a modei formelor de fitness, care creează monotonie sunt deja cunoscute ca fiind printre motivele de a căuta noi modalități de a implica oamenii în sport pentru sănătate. Acest document este destinat a fi o oportunitate sau o a doua șansă pentru activitatea fizică în mediul acvatic în plus față de înot. În lucrare, am inclus mai multe aspecte referitoare la particularitățile acestei activități de agrement, o scurtă analiză a dinamicii modificărilor bio-fiziologice induse de exerciții, precum și o practică sistematică ce ascunde formele în spatele numelui generic de fitness acvacultură.

Titre: Alternative sports loisirs pratiques - aqua fitness. Délimitations conceptuelles.

Mots-clés: Aqua fitness, les exercices de substitution, conceptuelle du savoir-faire.

Résumé: L'évolution extrêmement rapide de formes alternatives de remise en forme n'est plus une surprise pour les experts dans le domaine ou pour le public. En fait, les tendances de consommation de loisirs, les goûts sophistiqués jamais de la population, et la sortie rapide de la mode des formes anciennes-nouvelles de remise en forme, la monotonie et des exercices déjà connus sont parmi les raisons de rechercher de nouvelles formes d'impliquer les population dans le sport pour la santé. Ce document vise à être une chance ou une seconde chance pour les activités physiques dans le l'environnement aquatique outre la natation. Dans le papier, nous avons inclus plusieurs aspects concernant les particularités de cette activité de loisir, une brève analyse de la dynamique des changements bio-physiologique induit par ce type d'exercices, ainsi que d'une systématisation de la pratique des formes se cacher derrière le nom générique de l'aquaculture de remise en forme.