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Original article

Investigations regarding the opinions of the specialists on the knowledges of the Bad Ragaz Ring Method

CULEA Rodica-Georgeta[1], SIMION Gheorghe[2]

Abstract

Aim. The aim of this research is to investigate the opinion of specialists, physiotherapists, doctors specializing in medical/sports recovery, about the Bad Ragaz Ring Method, and how to use it, including the application and effects of this method on sprains ankle. The present research focuses on the recovery of the ankle sprain in junior footballers and aims to compare the Bad Ragaz Ring Method with other aquatic methods to determine which are the most effective and fastest techniques among them, for the recovery of athletes.

Methods. For a more objective assessment of the degree of knowledge and use of the Bad Ragaz Ring Method in the treatment of ankle sprains applied to junior athletes in Romania, we conducted a sociological survey focused on the application of a questionnaire. The questionnaire was sent to a number of 189 subjects and answered 117 subjects in the field of recover. The questionnaire was addressed to specialists in the category of doctors, physiotherapists, with different professional experiences, from Romania and from Europe: 11.70% come from Spain, 9.36% from France, 7.02% from England, 8.19% from Italy and 63.73% from Romania.

Results. The questionnaire considered the identification of the respondents with the first 8 questions, and for the determination of the degree of knowledge regarding the Bad Ragaz Ring Method and its application, another 13 questions. Thus, when asked if this method of aquatic recovery is known, 74.36% answered negatively and 25.64% answered positively. In order to have a clear understanding how often the Bad Ragaz Ring Method was applied, the next question was answered by the 78 respondents (65.10%), that they did not apply it. It turned out that the application of the BRRM technique was done by the specialists interviewed with the following frequency: "very rarely" stated 3 (2.05%) respondents, "rarely" applied 14 subjects (12.5%), "often" worked 10 (9.2%) respondents and "always" 12 (11.5%) respondents. Of those who applied this technique, 24 (21.30%) were very good results, 13 of them were good (10.1%) and only 2 subjects (2.70%) reported poor results.

Conclusions. The most of respondent doesn't know the Bad Ragaz Ring Method, they don't have scientific informations about efficiency of it, or some of them who knows the method answered that they have not the conditions for aplying it. We found that the respondents from other country knows this method and less from Romanian physioteherapists.

Keywords: Bad Ragaz Ring Method, aquatic therapy, ankle sprain.

Introduction

In Europe, in recent years, water recovery has expanded greatly and has grown sharply. This is due in part to very advanced technology, material endowments, state-of-the-art equipment that helps in the recovery process, rethinking older techniques and reconsidering the traditions of those who developed the aquatic method of recovery.

Aquatic recovery includes several methods Watsu, Ai Chi, Halliwick, AquaStrech™, including the Bad Ragaz Ring Method. In our country it is less known, it has developed in recent years, more especially in Bucharest and Constanța.

Schitter et al. (2020) described Watsu (assembling two terms: water and shiatsu) like a form of passive hydrotherapy in chestdeep thermoneutral water (35˚C = 95˚F = 308.15 K). It combines elements of myofascial stretching, joint mobilization, massage, and shiatsu is reported to be used to address physical and mental issues.

To practice Watsu, a therapist stands in thermoneutral water (35˚C = 95˚F = 308.15 K), supporting the supine receiver with hands, forearms, or shoulders and softly moving her / him in slow and spacious circular motion sequences following elaborate movement patterns related to receiver's and therapist's level of experience (Dull 2004).

Ai Chi can be characterized as a series of continuous slow and broad movements, accomplished

[1]„Ovidius" University of Constanta, Faculty of Physical Education and Sport, Romania
[2]University from Pitesti, Doctoral School in Science of Sport and Physical Education University of Pitesti, Romania
Corresponding author: rodyca_2004@yahoo.com

without force. It consists of movement patterns of the arms, arms and trunk, and arms, legs and trunk, with gradual narrowing of the basis of support combined with deep breathing (Cole et al. 2010).

The Halliwick concept is a structured learning progress that aims to improve independence in the water and gain better movement control and balance. It involves ten exercises: mental adjustment, release, vertical rotation, lateral rotation, combined rotation, flotation, balance, weathering turbulence, basic movement and fundamental movements, (Nowakowska et al. 2011).

AquaStrech™ is a technique that combines manual therapy and active assisted exercise in a gravity-reduced aquatic environment (Alejo et al. 2018).

AquaStretch™ uses buoyancy, weighted resistance, and prescribed methodology to produce outstanding results, from athletic performance to rehabilitation (Sherlock 2014).

Bad Ragaz Ring Method (BRRM) is a method of treatment used in aquatic therapy, based on the principles of proprioceptive neuromuscular facilitation techniques (FNP). This method aims to facilitate functional movement, using concentric, eccentric and isometric muscle contractions, thus increasing joint mobility and reducing muscle fatigue. Bad Ragaz Ring is an active technique in which the physiotherapist provides resistance to the patient's movement either manually or with the help of tools to activate the muscle receptors, generating a response in the motor pathways. The movement is facilitated to activate the weak muscles (Ainslie 2012).

The Bad Ragaz Ring Method consists of three modes, for the trunk, upper limbs and lower limbs. They are also classified as unilateral or bilateral. Models are made floating in supine position or for some models of the upper limbs they are made in inclined position, and for some models of trunk they are in lateral position. The use of the BRRM favors a shorter recovery time, because when combining the movements, all the muscle groups are activated, which leads to the improvement of the patient's muscle strength much more efficiently (Gueita Rodriguez Javier et al. 2015).

The aim of this research is to investigate the opinion of specialists, physiotherapists, doctors specializing in medical / sports recovery, about the BRRM, and how to use it, including the application and effects of this method on sprains ankle. The present research focuses on the recovery of the ankle sprain in junior footballers and aims to compare the BRRM with other aquatic methods to determine which are the most effective and fastest techniques among them, for the recovery of athletes.

Methods

For a more objective assessment of the degree of knowledge and use of the Bad Ragaz Ring Method in the treatment of ankle sprains applied to junior athletes in Romania, we conducted a sociological survey focused on the application of a questionnaire. The questionnaire contains 21 questions (12 closed and 9 open questions). For the identification of the subjects, 8 questions are asked, and for the determination of the degree of knowledge regarding the BRRM and its application, another 13 questions.

In order to achieve a clear, correct and realistic picture, the questionnaire was sent to a number of 189 subjects and answered 117 subjects in the field of recovery. The questionnaire was addressed to specialists in the category of doctors, physiotherapists, women and men, with different professional experiences, from Romania and from Europe. The questionnaire was applied in January 2022 and was designed together with a sociology specialist from Ovidius University of Constanța. Google Forms software was also used, which directly calculates the statistical data of the subject response. Consent was requested of the of the respondentes to accept the publication article and ethical requirements were met.

Results

The questionnaire considered the identification of the respondents with the first 8 questions. Thus, out of a total of 117 subjects investigated, 40.20% are men and 59.80% are women, 107 are physiotherapists and 10 are doctors specializing in recovery or sports medicine. Of these, 96 (80.8%) work in medical recovery, 5% respectively 6 subjects are doctors specializing in sports medicine, another 6.4% work in pediatrics, 4.2% orthopedics, and 3.6% other specializations.

Regarding the studies they graduated, most respondents (56.4%) graduated with a master's degree, 36.6% with a bachelor's degree and 7% with a doctorate.

Regarding the place where the respondents carry out their activity, 11.70% come from Spain, 9.36% from France, 7.02% from England, 8.19% from Italy and 63.73% from Romania (Fig.1). The percentage of those who are part of other European countries where this method of recovery was "born" is small. In the same time this respondents answered affirmatively to the questions related to the knowledge of the BRRM and the percentage is close to the maximum. Thus, when asked if this method of aquatic recovery is known, 74.36% answered negatively and 25.64% answered positively. Of the 117 respondents, they also

specified that they do not know clinical and scientific evidence, 32.12% and 7.36%, respectively, that they lack the time to apply this method or the necessary conditions (8.20%). Other respondents acknowledged that there was and were aware of the scientific and clinical evidence of the BRRM (a total of 26.34% of 117). 23 (20.08%) of the respondents stated that the method is not prescribed by specialized doctors and only 2 (1.30%) that they found it in prescriptions (Tabel 1).

To the question "Did you treat athletes with ankle sprains?" 90% (77) of the investigated subjects answered in the affirmative, another 15% (17) answered in the negative, and 8% (10) answered that they treated other categories of patients.

Respondents treated patients with sprains of different types (degrees), as follows: grade I, 24.6% (26); the highest frequency was found in grade II, 46.78% (58) of the respondents treated this sprain, 14.02% (16) treated grade III and 14.6% (17) respondents did not treat athletes.

When asked about the categories of athletes treated and the branch they practice, it was found that 85 of the 177 respondents treated footballers, 52 of them treated basketball players, 29 of the respondents, handball players, volleyball 17, and athletics 37. A total of 10 subjects out of the 117 investigated answered the category in other sports, and 17 respondents did not treat athletes.

The age level of the athletes treated by the investigated specialists was: under 10 years, 39 specialists answered (45.63%), between 10-12 years, 62 of the respondents answered (72.54%), and over 12 years 25 of the 117 (26.91%) answered, and another 17 (14.6%) did not treat athletes.

In order to have a clear understanding how often the Bad Ragaz Ring Method was applied, the next question was answered by the 78 respondents (65.10%) who previously stated that they did not know this therapy, that they did not apply it. It turned out that the application of the BRRM technique was done by the specialists interviewed with the following frequency: "very rarely" stated 3 (2.05%) respondents, "rarely" applied 14 subjects (12.5%), "often" worked 10 (9.2%) respondents and "always" 12 (11.5%) respondents.

Of those who applied this technique, 24 (21.30%) were very good, 13 of them were good (10.1%) and only 2 subjects (2.70%) reported poor results. Of course, those who stated that they did not work with this technique are also found here in the statement that they did not get results, so 78 (65.9%) respondents.

To the question "What other therapies have you used to treat junior athletes with an ankle sprain?" they replied that they had applied manual therapy a number of 77 investigated subjects, so 65.85%. Dry needling was applied by 6 specialists (5.1%), another therapy applied was Kinesio taping by 73 specialists (62.4%), and 31 specified various other therapies (30.1%).

It is interesting to note that after the therapies they applied, the patients experienced recurrences. Thus, 56.88%, 67 answered, that there were no recurrences, and 5 respondents (4.23%) answered affirmative. The remaining 45 respondents (38.89%) of those surveyed said they did not know.

Regarding the application of the Bad Ragaz Ring Method, the respondents answered that there were no recurrences 22.2% (26), "they did not know" 70.1% (82) and 7.7% (9) answered in the affirmative way.

Tabel 1. Questions from the questionary with identify the knowledge of Bad Ragaz Ring Method

No.	Qestions	Answers	Results	
1.	Do you know Bad Ragaz Ring Method?	Yes, I know this technique	39	25.64%
		No, I don't know this technique.	78	74.36%
		I do not know the clinical evidence for this technique	36	32.12%
		I recognize the clinical evidence for this technique	14	12.30%
		There is no scientific evidence for this technique	9	7.36%
		There is scientific evidence for this technique	17	14.04%
		I'm running out of time to apply this technique	5	4.60%
		I lack the necessary conditions	11	8.20%

		to apply this technique		
		The technique is not by prescription	23	20.08%
		The technique is by prescription	2	1.30%
2.	Have you treated athletes with sprained ankles?	Yes	90	77%
		No	17	15%
		Other patients	10	8%
3.	What is the most commonly treated type of sprain?	Grade I	26	24.6%
		Grade II	58	46.78%
		Grade III	16	14.02%
		Did not treat athletes	17	14.6%
4.	If you have treated junior athletes with an ankle sprain, which sports area are they part of?	Football	85	72.6%
		Basketball	52	44.5%
		Handball	29	24.8%
		Volleyball	17	14.6%
		Athletics	37	31,7
		Did not treat athletes	17	14.6%
		Others sports	10	9.9%
5.	What is the age category of athletes with ankle sprains?	Under 10 years	39	45.63%
		11-12 years	62	72.54%
		Over 12 years	25	26.91%
		Did not treat athletes	17	14.6%
6.	If you have recommended / applied the BadRagazRing technique during the treatment of glen sprains in junior athletes, what was the frequency?	Never	78	65.10%
		Very rarely	3	2.05%
		Rarely	14	12.15%
		Often	10	9.20%
		Always	12	11.50%
7.	If you applied the Bad Ragaz Ring Method to the treatment of patients with ankle sprains, what results did you get from applying the technique?	Very good	24	21.30%
		Good	13	10.10%
		Poor	2	2.70%
		Did not apply	78	65.9%
8.	What other therapies have you used to treat junior athletes with ankle sprains?	Manual therapy	77	65.85%
		Dry needling	6	5.1%
		Kinesio taping	73	62.4%
		Others	31	30.1%
9.	Have you experienced recurrences as a result of your therapy in treating ankle sprains in junior athletes?	Yes	5	4.23%
		No	67	56.88%
		Not know	45	38.89%
10.	If you applied the Bad Ragaz Ring Method in treating ankle sprains in junior athletes, did recurrences occur?	Yes	9	7.7%
		No	26	22.2%
		Not know	82	70.1%

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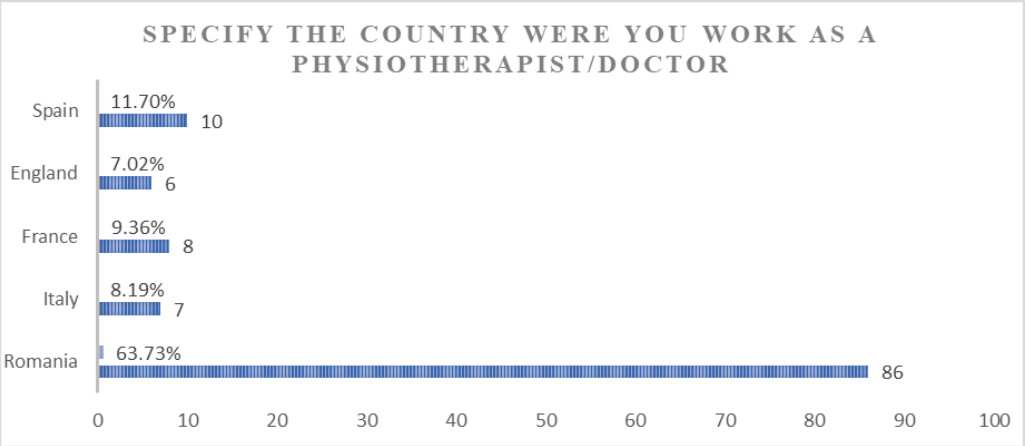

Figure 1 Graphic representation of the countries of the respondents.

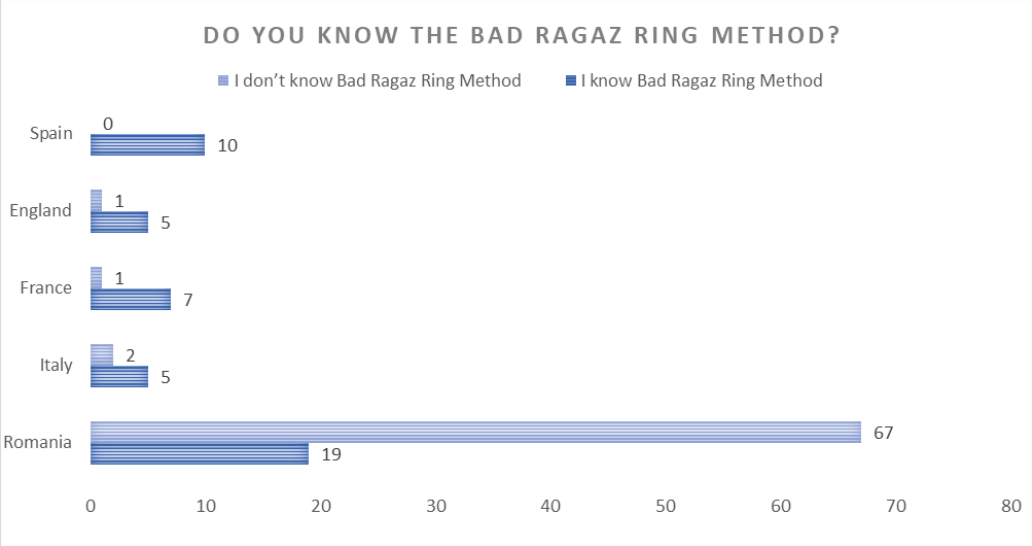

Figure 2 Graphic representation of the level of knowledge of Bad Ragaz Ring Method

Discussion

This study confirmed that the Bad Ragaz Ring Method is not known both in Romanian country and internationally. Where investigated 117 subjects from europeean teritory, 10 subjects from Spain, 8 from France, 6 from England, 7 from Italy and 86 from Romania. We tried to find out if this method is known and we received the most positive answers from Spain and England, from Italy and France we received some negative answers. There have been very few positive responses from Romania (Fig. 2).

So, it is known that aquatic therapy is widely used to treat chronic diseases, such as, arthritis, nerve disorders, and cerebral palsy (Hyun Gyun Cha, Young Jun Shin 2017). The same authors affirm that aquatic therapies designed to improve balance and walking abilities, have recently attracted attention, and have been suggested for the rehabilitation of stroke patients. Water provides an excellent medium for healthy individuals and those with disability due to its physical characteristics of viscosity, buoyancy, density, specific gravity, and hydrostatic pressure (Noh et al. 2008). Veldema and Jensen (2020) in their meta analysis about effect of aqua therapy interventions in stroke, found in 28 appropriate studies (N = 961) that aquatic therapy shows superior effectiveness on balance, walking, muscular strength, proprioception, health-related quality of life, physiological indicators, and cardiorespiratory fitness. Only on independence in activities of daily living the land- and water-based exercise induce similar effects. Established concepts of water-based therapy (such as the Halliwick, Ai Chi, Watsu, or Bad Ragaz Ring Methods) are the most effective, aquatic treadmill walking is the least effective.

This reaserch investigate the influence of aqua therapy in sport injuries, and especially what it is known about BRRM in this fild.

The questionnaire found that the most of respondents (90) affirmed that they treated ankle sprain, most of them (77) with other methods than aqua therapy, and the results were good for the athlets (67) and no recidives. For BRRM the answers were favorabil for 39 respondents, with no recidives (26) and very good recovery (24). The respondents from our investigation worked with different types of athlets, from soccer, handball, baschetball, voleyball, track and filds and from others branches and we found that only the physiotherapists from other country recovered using BRRM. So, it was found by Kim and Choi (2014) in a systematic review of literatury that aquatic physical therapy in the rehabilitation of sports injuries improved pain, range of motion, muscle strength, balance ability, and performance, but the evidence regarding benefits of aquatic physical therapy compared to land-based physical therapy was inconclusive.

Athletes engage in several sporting events and activities. The masters-level athletes, especially, compete for well over 50-60% of their lifetime. Because athletes these days are training harder, competing more often, and taking lesser time for recovery, they are likely to suffer from sports injuries such as sprain, tendinopathy, bursitis, and stress fractures (Thein et al. 1998). The incidence rate of ankle sprain, one of the most common sports injuries, is 7 per 1,000 exposures or 1.37 per 1,000 athletes and 4.9 per 1,000 hours affirmed. Doherty et al. (2014). Ragab and Mohamed (2020) in their study compared the impact of the combined program containing land-based exercises and hydrotherapy to land-based exercises alone in patients with chronic lateral ankle sprain. They found that the study results revealed that participants in both the hydrotherapy group and the land-based therapy group had improved ankle functional ability and no differences between the two groups ($p > 0.05$). In other study Poonyanat et al. (2013) aimed to compare the effect of a 6-week functional rehabilitation program in athletes with chronic ankle instability between a hydrotherapy plus ankle taping group and a land-based plus ankle taping group on ankle functional ability, ankle joint position sense and the number of reinjuries. They found that in the hydrotherapy group, the time taken in the single-limb hopping test significantly decreased immediately after exercise and at the follow up compared with baseline ($p = 0.001$). In the land-based group, time taken in the single-limb hopping test significantly decreased at 3 months follow up compared with baseline ($p = 0.05$). No significant differences were detected between groups in ankle joint position sense and the number of recurrent ankle sprains. All participants returned to their athletic activity and competition.

Another research (Valdemar et al. 2020) has indicated that an acute multi-session hydrotherapy with hydrogen-rich water might be a helpful treatment in terms of pain, swelling reduction and regaining range of motion after an ankle sprain, gr II.

Conclusions

The most of respondent doesn't know the BRRM, they don't have scientific informations about efficiency of it, or some of them who knows the method answered that they have not the conditions for aplying it.

We found that the respondents from other country knows this method and less from Romanian physioteherapists.

The questionnaire found that the most of respondents affirmed that they treated athlets by ankle sprain, most of them with other methods than aqua therapy. For Bad Ragaz Ring Method the answers were favorabil only for few respondents, with no recidives, and very good recovery.

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