



Original article

## Curing the sick and creating supermen – How relaxation in flotation tanks is advertised on the Internet

Kristoffer Jonsson\*, Anette Kjellgren

Karlstad University, Department of Psychology, SE-651 88 Karlstad, Sweden

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### Abstract

**Introduction:** Flotation-REST (Restricted Environmental Stimulation Technique) is a complementary and alternative medicine therapy with evidence-based beneficial effects like pain and stress reduction. During flotation-REST a person is lying in a supine position inside a quiet and dark tank, filled with salt water maintained at skin temperature. The water is high in buoyancy, which makes it possible to float comfortably on the back. The method induces deep relaxation through minimization of sensory input. Contemporary scientific findings about beneficial effects resulting from floating have increased the number of private owned floating centers. The aim of this study was to investigate how these centers advertise the benefits of flotation to the public and compare these claims with published scientific evidence.

**Method:** The Google search engine was used to localize web-sites hosting private floating center entrepreneurs. Described effects resulting from floating on these sites were systematically gathered and analyzed thematically. In addition, advertisements were compared to scientific studies on flotation-REST.

**Results:** The analysis resulted in five overarching themes: (1) Physiological changes, (2) Alleviation of medical conditions, (3) Relaxation, (4) Personal growth and enhancement, and (5) Altered states of consciousness. Advertisements seemed to target four different interest groups: the inner explorers; the sick; the supermen; and the stressed out. Various effects of flotation were highlighted for the different groups and some limited scientific evidence identified.

**Conclusions:** Although the advertisements described many evidence-based effects resulting from floating, information tended to be exaggerated, could be misleading to consumers, and was not always substantiated by published scientific studies.

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**Keywords:** Complementary and alternative medicine; Flotation tank therapy; Internet; Advertisement; Flotation-REST; Relaxation

### Introduction

It has been suggested that complementary and alternative medicine (CAM) therapies, such as acupuncture, chiropractic and herbal remedies, exist as an “invisible mainstream” health care approach, parallel to conventional healthcare [1]. A survey conducted in the US showed that the total number of visits to CAM therapies exceeded the total visits to primary care physicians [2], and a trend has been noted in which a growing number of patients are seeking out CAM therapies for

various medical conditions [3,4], even for severe conditions that can be life-threatening [5,6]. The view of CAM therapies amongst the public is often that they are equally effective as conventional healthcare treatments, but more natural and with fewer side effects [7]. Previous research has pointed out that patients might be reluctant to discuss use of CAM therapies with their physicians to avoid disapproving reactions [8], which might be one explanation for the increasing popularity of the Internet as a source of information regarding CAM therapies for patients [5]. In addition, healthcare professionals are seldom specified as a source of information regarding CAM therapies [9]. This, and the fact that the research on efficacy regarding specific CAM therapies is limited, leaves the patients in the dark to self explore and make up their own mind from potentially unreliable sources. This highlights

\* Corresponding author. Tel.: +46 547001899.

E-mail addresses: [kristoffer.jonsson@kau.se](mailto:kristoffer.jonsson@kau.se), [krisjons@kau.se](mailto:krisjons@kau.se) (K. Jonsson), [anette.kjellgren@kau.se](mailto:anette.kjellgren@kau.se) (A. Kjellgren).

Table 1

Keywords: utilized in the Internet search for private floatation centers, number of sites found within the first 100 hits and total sites used in analysis after exclusion.

Keywords	Number of sites found
Floating	46
Flotation	13
Floating tank therapy	5
Flotation-REST	6
Floating center	5
Flotation center	2
Sensory isolation tank	0
Float tank	2
Floating tank	3
Flotation tank	2
Sensory deprivation tank	2
Restricted Environmental Stimulation Technique	0
Total after exclusion	84

the importance of conducting systematic research in these areas.

Flotation REST (Restricted Environmental Stimulation Technique) is regarded as a CAM therapy, although accepted as a medical treatment in some European countries [10], which has been associated with evidence-based beneficial effects like pain reduction [11] and stress reduction [12]. Flotation-REST was developed by Lilly [13,14] who was also one of the first people to report on floating as a pleasant experience. During flotation-REST a person lies in a supine position inside a quiet and dark tank, filled with salt (magnesium sulfate) saturated water maintained at outer skin temperature. The water is high in buoyancy, which makes it possible to float comfortably on the back inside the tank. The method induces deep relaxation through the minimization of sensory input. Contemporary research on flotation-REST has established a treatment protocol consisting of 12 sessions (45 min) approximately twice a week. This has been suggested as sufficient to reach desired stress and pain reducing effects [15]. Flotation-REST has been used successfully as a treatment for chronic pain conditions [15–18], and burn-out syndrome [19,20]. In addition, an array of effects has been observed after flotation-REST, such as, increased well-being [21], mild euphoria [22], increased creativity [23,24], reduced anxiety [25], enhanced sleep quality [17,26], muscular tension reduction [27], lowered blood pressure [25,28], and altered states of consciousness [29,30]. There are also pilot studies indicating significant improvements of neuropsychiatric conditions like ADHD (attention deficit hyperactivity disorder) and Asperger syndrome [31,32], as well as promising results when flotation-REST was used in adjunction to psychotherapy [25,33–36].

During relaxation in a flotation tank, changes in physiological markers, e.g. lowering of stress hormones have been observed [11,16,37–39]. Increased levels of endorphins have been claimed to underlie the pain reducing effects of flotation-REST [22,35] but this has not been confirmed [16]. It has also been hypothesized that changes in the endogenous cannabinoid system might explain some of the effects resulting from flotation-REST [40].

Table 2

The number of websites hosting private floatation tank centers divided by countries in which they operated.

Country	Websites found
Unites States of America	46
Sweden	23
England	12
Holland	2
Norway	1
Total	84

Scientific findings about positive effects of floating, have led to an increase in the number of privately-owned floating centers offering flotation-REST as treatment. In the advertisements, a multitude of effects are stated as resulting from floating, but to what extent this information is correct has not yet been systematically investigated. The present study aimed to examine how flotation-REST is advertised on the Internet by searching for publicly available websites hosting private floating tank centers and to compare this to its documented scientific effects in the scientific literature obtained from the major scientific databases. This seems highly relevant in the light of the growing interest in CAM-therapies among public and because the individuals who seek out these therapies might be vulnerable to the alleged claims made by such treatment.

## Method

### Data collection

The data for the study were collected on the Internet by searching for websites where commercial floating tank centers advertised effects resulting from floating. The Google search engine (English) was used and twelve different keywords (given in Table 1) associated with floating were entered. The 100 first hits for every keyword were searched for commercial floating tank centers. In total 86 websites were identified, of which 84 were included (two were duplicates) in the present study.

Each website was explored in detail, and the relevant text about effects was transferred to a word document for further analysis. In total, 47 pages of text were generated. No URLs or web addresses will be presented here. All searches were made in October 2013. The 84 websites belonged to flotation tank centers in five countries (Table 2).

### Analysis

Thematic analysis was applied to the data [41] to identify patterns in the advertisement. The goal of the study was to characterize how effects of floating were advertised by commercial floating tank centers. The process of analysis was performed by both authors and completed once mutual agreement had been reached for each step of the process. The analysis was performed in five steps:

Step 1 consisted of reading and re-reading all the collected data to become familiar with the content.

Step 2 consisted of coding the data for fundamental constituents of semantic meaning (coded element; CE) without losing their contextual relevance. For an example, the sentence: “When people float they experience a sense of discovery, they solve their problems creatively and they experience timelessness”, resulted in three CEs coded as: “Self-exploration”, “Increased problem-solving ability” and “Alteration of time perception”. In total this step generated 1429 CEs.

Step 3 consisted of establishing recurring patterns in the CEs that could constitute potential overarching themes. This was done by assorting and combining the CEs that were similar and seemed to relate to each other into 58 sub-themes.

Step 4 consisted of further work through and refining the potential themes by combining sub-themes into overarching themes. The division was guided by continually consulting the raw data to make sure this process was grounded in the original data. The goal was to reach coherence within themes and clear distinction between themes.

Step 5 consisted of appropriate labeling of the themes and identification of each theme's fundamental meaning. The outcome of this step was a written analysis supported by clarifying quotations from the data set.

Across the whole analysis, the guidelines for thematic analysis [41] were thoroughly followed to ensure a credible analysis. Every step of the analysis process was given adequate attention and was performed with an as open and bias-free attitude as possible.

In addition, the advertised effects resulting from flotation-REST, as described in the themes, were compared to documented scientific effects obtained from the major scientific databases.

#### Ethical consideration

The data were collected using the Google search engine to access publicly available websites hosting commercial float tank entrepreneurs. All information that could connect specific data to a certain floating tank center was deleted when the data was transferred to the initial word document (data set). No names or web-addresses were saved. No information that could be connected to a specific person was gathered in the present study.

#### Results

The analysis resulted in 1429 CEs that all reflected descriptions of advertised effects of floating. The CEs were combined into 58 sub-themes, which subsequently were combined into five overarching themes: (1) *Physiological changes*, (2) *Alleviation of medical conditions*, (3) *Relaxation*, (4) *Personal growth and enhancement*, and (5) *Altered states of consciousness*. These advertised effects claimed to result from flotation-REST were then compared to existing scientific research on flotation-REST. Worthy of note is that the statements in the advertisement were compared mainly to research on flotation-REST and not to sensory deprivation (SD) in the broader sense. The early research on SD have presented negative effects resulting from SD, but these conditions were quite different from the modern approach in that the duration tended to be much longer (several hours or

Table 3

Complete list of subthemes and number of coded elements in each sub-theme for the first overarching theme: Physiological changes.

Sub-themes	Coded elements
Changes of physiological markers	92
Bodily self-healing and restoration	79
Changes in brain function	65
Cardiovascular and respiratory changes	64
Enhanced immune system	26
Facilitating homeostasis	15
Skin vitalization	13
Bodily cleansing	10
Enhanced nutrient uptake and digestion	7
Total	371

several days), that chamber-REST was often used (dry, dark and soundproof rooms) and in that the focus of the research were different (not treatment oriented). For review of the early research on SD see Zubeck [42].

#### Physiological changes

The theme consists of 371 CEs that all reflected advertised physiological effects after floating (Table 3).

Several biological markers were allegedly affected by floating in a positive manner. Stress-hormones, such as adrenaline and cortisol, were said to be lowered. Prolactin, associated with immune function and psychological health, was said to be elevated, and the levels of endorphins, an endogenous opiate, were said to be increased: “A single session in a floatation tank causes your brain to release endorphins, replacing stress with a sense of well-being.” Some of these statements are confirmed by research, for example, the lowering of stress hormones [11,16,37–39]. Regarding the alleged changes in endorphin levels as a mediator of pain relief, the scientific support is less clear. Our study [16] found no changes in endorphin levels in a patient group with muscle tension pain even though they experienced pain relief.

Positive effects on the cardiovascular systems as well as on respiratory function were advertised: “Blood vessels including capillaries dilate, improving cardio-vascular efficiency and increasing the supply of oxygen and nutrients to every single cell in your body”. These effects are partially confirmed in studies [11,28] where blood pressure was normalized. Also enhanced nutrient uptake and digestion were mentioned as effects in the advertisements, effects which have not been studied in relation to flotation-REST.

Floating was declared to be a remedy for magnesium deficiency because of the absorption of magnesium from the Epsom salt (magnesium-sulfate) in the tank. The Epsom salt was also described to have other health-effects, such as vitalizing the skin and aiding the body in cleansing itself from toxins: “Epsom salt has been shown to not only strengthen your mind and body connection, but your skin and nails as well. The high concentration of magnesium sulfate from the salt dissolves lactic acid and mineralizes the body. This reduces or eliminates muscle soreness and tension”. The promoted health effects of Epsom salt are partly confirmed by earlier studies, where it is believed to

have therapeutic effects [43], by relaxing the muscles, as well as lowering systolic blood pressure and having an arterial vasodilator effect [44,45]. To what extent the Epsom salt from the tank can be absorbed through the skin is unclear [46–48], but it was often stated in the advertisements that this was the case: “*magnesium is absorbed through the skin due to natural molecular diffusion.*”

It was stated that floating stimulated the body’s capacity for self-healing: “*your body can devote its energies to restoring itself to its optimal state of balance, its natural equilibrium, in which all parts and systems harmoniously work together.*” It was also described as being an effective method to speed up recovery from injuries and to enhance restoration from hard physical labor or exercise: “*The ultra-deep relaxation of floating “resets” the body’s hormonal and metabolic balance, strengthening resistance to and accelerating recovery from the effects of stress, illness, injury or strenuous exercise.*” To what extent floating can facilitate rehabilitation of injuries is unclear, but studies on floating from a sport psychological context have demonstrated that increased restoration after training and competition occurs [27,49–53].

Statements about improved function of the immune system were also found but this has not been studied thoroughly. One study observed enhanced immune response after floating, reflected by increased levels of T-lymphocytes and B-lymphocytes [54], which provides too little support for promising improved immune system function.

Various changes in brain-function were also said to result from floating. Brainwave patterns associated with relaxation (alpha-waves) and deep meditation (theta-waves) were said to be induced, as well as increased right hemisphere activity. Some indications of heightened theta-activity have been observed after floating in one study [55]. In the research on EEG changes after relaxation techniques in general the findings are not conclusive. Although many studies have observed increased alpha-activity, others have reported decreased alpha-activity [56]. The most frequent finding is increase in theta-activity [e.g. 57], which have been pointed out by some researchers to resemble theta-activity during stage-1 sleep and hypnagogic states [e.g. 58].

#### *Alleviation of medical conditions*

This theme summarizes 249 CEs that all referred to improvements of medical conditions, where floating was presented as an alternative and complementary treatment without side-effects (Table 4).

Floating was extensively advertised to have pain-reducing effects for several chronic pain conditions, such as rheumatoid condition and arthritis, headaches, migraine, whiplash, injuries and other chronic pain conditions resulting from long-term stress and tension: “*Floating reverses the effects of gravity, relieving pressure, relaxing muscles and providing relief from painful conditions.*” The advertised pain-relief from floating has been confirmed by several studies where chronic pain was lowered after a series of floats with lasting effects at four month follow up [15–18]. Also, reduced pain associated with tension headaches has been observed in one pilot study [59]. The advertisement

Table 4

Complete list of subthemes and number of coded elements in each sub-theme for the second overarching theme: Alleviation of medical conditions.

Sub-themes	Coded elements
Pain relief	81
Treatment for depression	25
Alleviates fatigue	20
Treatment for substance abuse and addiction	18
Reduction in anxiety and fears	16
Alleviates jet lag	16
Treatment for arthritis and fibromyalgia	13
Treatment for burn-out syndrome	12
Complementary treatment	11
Cumulative effect	11
Treatment during pregnancy	10
Weight loss	10
Treatment for headaches and migraine	9
Treatment for insomnia	6
Treatment for asthma and allergies	5
Treatment for skin-disease	3
Treatment for phobias	3
Total	249

also stated that floating could be an alternative to pain-reducing medications and was said to be free from side-effects, and to be an aid in rehabilitation and recovery.

Floating was presented as a treatment for fatigue and burn-out syndrome and as a time-effective treatment for gaining energy and vitality. Depression and anxiety were said to be reduced with subsequent and gradual increase of more positive emotional states. In addition, fear and avoidance tendencies, such as phobias, were said to be alleviated by floating, and destructive habits were said to be opened up for change, stated here, for example: “*floating diminishes depression, anxiety and fear and facilitates freedom from phobias and addictions.*” Reduction in depression and anxiety is a robust finding across many different studies [11,34,35], making floating a promising complementary treatment for mood disorders, and possibly also a way to overcome destructive habits, such as addiction, which has been indicated in one study [60].

Also, floating was said to alleviate sleep-problems and insomnia. Floating as a treatment for insomnia has been studied with promising results in one study [26], and enhanced sleep-quality in general is confirmed by research [16,20]. These effects tended to be exaggerated in the advertisements through statements that one hour of floating corresponded to several hours sleep, as humorously put by a floater quoted in the advertisement: “*I felt more rested than if I had slept for 16 hours on a pile of tranquilized chinchillas.*”

Flotation was also presented as being beneficial for various skin-problems, as for example psoriasis. Although this has not been researched thoroughly in conjunction with flotation-REST specifically, there is some evidence that treatments with bath-salts (Epsom salts included) could be beneficial for these conditions [48,61]. Furthermore, floating was said to be a treatment for over-weight, and also presented as method to alleviate unspecified negative symptoms during pregnancy, claims that up to date is not supported by research on flotation-REST.

Table 5

Complete list of subthemes and number of coded elements in each sub-theme for the third overarching theme: Relaxation.

Sub-themes	Coded elements
Stress reduction and relaxation	151
Enhanced sleep-quality	62
Reduced muscle tension	43
Weightlessness	43
Energy and well-being	23
Respite from demands	12
Rest from sensory perception	9
Total	343

### Relaxation

This theme includes 343 CEs describing how floating was advertised as a powerful tool for deep relaxation and to get a break from everyday demands and responsibilities (Table 5).

The floating centers highlighted the calming and relaxing effects, of reducing general stress levels and muscle tensions, as enthusiastically put by one floating center: “floating is a method of attaining the deepest rest that humankind has ever experienced!” It was presented as a way to get time for one-self, and to get a break from everyday routine: “For many people, a one hour stay in a float tank can be compared to a week long holiday.” The advertisements often stated that the stressful information society of today was an unnatural environment that needed to be balanced with effective tools for relaxation (e.g. floating): “Floating is like hitting the reset button on your life, learning how to truly let go and relax, which has become so difficult in our busy society.” The float tank was described as an environment free from demands, and the effects of floating would be manifested without effort, as stated in this advertisement: “Everyone can float and benefit from it. You don’t need any practice, knowledge or discipline.”

Even though the stress-reducing effects of floating were exaggerated in the advertisements, floating is known to be an effective method to induce a relaxation response even in persons with severe stress problems [11]. Interestingly, stress-reducing techniques are often hardest to perform for those in the greatest need of it [62], a fact that does not seem to be the case with floating, since the relaxing effects of floating seem to be induced without effort.

Floating was also presented as a way to let the brain rest from sensory processing, and even gravity: “A massive amount of brain-power is used every second in order to deal with the huge strain that gravity places on one’s body. As the body is now totally supported, there is little for the brain to do and every muscle is allowed to totally relax.” Furthermore, floating was described as a unique free environment where a state of weightlessness seldom experienced elsewhere could be experienced: “Unless you’re planning a trip to outer space, our flotation tanks are as close as you will get to weightlessness.” These statements are highly speculative but qualitative studies on floating have reported subjective experiences of weightlessness to be rather common when floating [40].

Table 6

Complete list of subthemes and number of coded elements in each sub-theme for the fourth overarching theme: Personal enhancement and growth.

Sub-themes	Coded elements
Enhanced creativity	59
Benefits for athletes	52
Increased ability to concentrate and focus	35
Enhanced learning ability	30
Personal self-development	30
Enhanced problem-solving ability	15
Freeing up the brains potential	12
References to famous people who floats	10
Increased motivation	11
Increased performance	8
Total	262

### Personal growth and enhancement

This theme consists of 262 CEs that all highlight floating as a method for enhancing performance and increased personal self-development (Table 6).

Floating was advertised as having various enhancing effects that could contribute to reaching desired goals, and also it was said to unlock latent creative potential: “While we normally only use 11% of our total brainpower, a session in the float tank enables us to tap into the other 89% previously unreachable source of creativity.” Advertisements described floating as a “magic bullet” to get through stagnation in the creative process (e.g. writers block), but also as a way to get more original ideas and greater flexibility. In addition, the ability to learn was described as being improved resulting in a kind of “superlearning”: “Floating induce a theta state which is considered the gateway to learning and memory”. Studies on learning [55,63], as well as floating and creativity have indicated increased originality and altered states of consciousness after floating [23,24,64–66], which makes the statements about increased creativity relatively truthful, although exaggerated and speculatively presented. Sensory deprivation tends to reduce the activity of so called secondary processes, such as abstract thinking and thoughts about event in everyday life, concurrently with primary processes, such as intuition, imagination and focus on the here and now, becoming more prominent [11]. This could further support statements regarding enhanced creativity.

Other enhanced cognitive functions were described; e.g. the ability to focus and use concentration in a goal directed manner, as well as making thinking clearer and more precise. These enhanced abilities was said to make the inner world more apparent and that floating due to this was an efficient tool to work with oneself in a psycho-therapeutic manner resulting in self-development: “Floating has the ability to give an individual profound introspective insight due to the elimination of virtually all sensory distractions resulting in increased self-knowledge.” Floating as a method for enhancing psychotherapy and creating increased self-development, are supported by a few pilot studies [33–36] where floating have been shown to be a promising complement to psychotherapy.

Table 7  
Complete list of subthemes and number of coded elements for each sub-theme in the fifth overarching theme: Altered states of consciousness.

Sub-themes	Coded elements
Deep meditative state	37
Increase in inner imaginations	26
Changes in body perception	18
Spiritual experiences	15
Increased awareness of subconscious processes	14
Extraordinary state of relaxation	13
Deep peace	13
Euphoria	12
Hypnagogic state	11
Increased sensitivity to sensory information	10
Sudden spiritual insight	9
Impaired analytic ability	7
Expansion of consciousness	7
Increased hypnotizability	6
Being reborn anew	6
Total	204

Floating was also said to enhance the performance of several career groups by increasing motivation and certain abilities, which would result in further success. Professional athletes were said to especially benefit from floating and were recommended to float, so as to speed up recovery from hard physical training, as stated here: “*athletic coordination and performance is improved by floating through greater stamina, speed, and quicker recovery time from intense workouts*”. Also improved performance was promised by visualization while floating (e.g. visualize ice-skating). Floating has successfully been used in a sport psychological context and resulted in fewer unwanted effects of stress, increased restoration after training and competition, as well as and increased athletic performance [27,49–53] making these statements reasonable.

#### *Altered states of consciousness*

This theme consists of 204 CEs that reflected floating as a way to explore oneself at a deeper level and to reach mystical or mind-bending states of consciousness (Table 7).

Floating was presented as a form of meditation practice, where deep and advanced meditation states could be reached faster than through regular meditation and without effort: “*This is the state-of-mind that Buddhist monks attempt to reach through hours of meditation and years of training*.” Floating was said to deepen an ongoing meditation practice, but also that it could be an alternative for those that found meditation practice too demanding. There is currently no scientific research that has compared meditation and floating effects, but floating seems to share some of the qualities of meditation, such as inducing a more mindful “here-and-now-state” [30].

Floating was also said to induce altered states of consciousness (ASC), with effects such as dreamlike visual imagery, altered body perception, euphoria, and increased self-awareness of subconscious processes, as illustrated by this advertisement: “*This is what the tank is all about- revealing to you your own assumptions, which are usually so implicit that you do not even*

*know they are there.*” Several of these characteristics of ASC have been confirmed in flotation tank research, as well as various spiritual experiences (e.g. insight into the nature of reality, being reborn anew or expansion of consciousness) that were said to be possible to reach by floating [29,30,67,68], although these experiences are relatively rare. ASC were presented as sought after effects in the advertisement, but have in the early research on sensory deprivation [42] sometimes been associated with stress and anxiety, which points to potential adverse reactions from flotation-REST, especially if treatment sessions is longer than 45 min. With this said it is important to note that the experiment conditions in these early studies on SD were different from today in regard to duration (several hours or days) and intention of the research (not treatment oriented). Also many of these studies applied chamber-REST (dry, dark and soundproof rooms).

The altered states of consciousness claimed to be experienced in the floating tank could be the effect of a shift in balance of primary- and secondary processing. One definition of primary processing is that they do not rely on sensory feedback. The floating condition effectively blocks sensory input, promoting primary processing [11], which resembles many of the ASC described in the advertisements. This can be contrasted to secondary processing, which predominantly consists of logic, analytical, abstract, and reality-oriented thinking. Strong ASC after floating has in some cases been observed in scientific studies, but contrary to the advertising statements these strong ASC happen only to a few. It has also been suggested in one study that high degree of ASC could be associated with high sensitivity [67].

Also, the senses were said to become more susceptible after floating, resulting in increased awareness of the subtleties of everyday life, as stated here: “*After the float, most clients experience stronger smells, brighter colors, more enhanced flavors, and more conspicuous sounds.*” This statement has not been systematically studied, but one study has indicated increased sensitivity to pain after floating [65].

#### *Floating as a holistic treatment*

On the whole, the advertisements seemed to target four different interest groups: *The inner explorers; the sick; the supermen; and the stressed out*. Various effects of floating were highlighted for the different groups. The stressed out were promised time for themselves, relaxation and increased energy; the sick were promised alleviation of various medical conditions; the supermen were promised enhanced performance; and the inner explorers were promised an inner adventure of self-discovery and various mind-bending experiences. Each of these concepts relates to a theme that resulted from the data analysis and was illustrated in a figure. The figure also shows that the themes overlap, indicating that the described effects within a certain theme might benefit effects described in the other themes. For an example, effects described in the theme relaxation might catalyze effects described in the theme alleviation of medical conditions. This highlighting floating as a holistic treatment affecting different physiological and psychological mechanisms (Fig. 1).

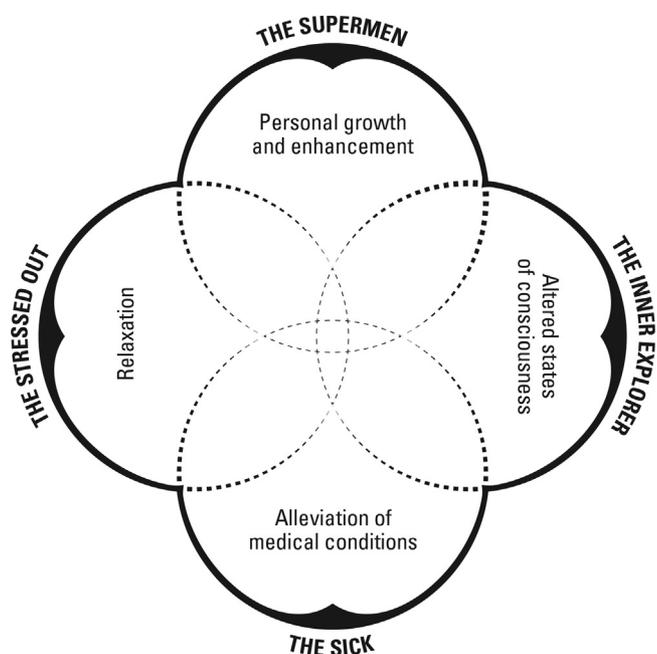


Fig. 1. Figure illustrating how the advertisement seemed to target four different interest groups, each corresponding to a theme that resulted from the data analysis. In addition the figure shows that the themes overlap, indicating that the described effects within a certain theme might benefit effects described in the other themes. This highlighting floating as a holistic treatment affecting different physiological and psychological mechanisms.

## Discussion and conclusions

The advertisements in general seem to be built on a mixture of scientific studies, descriptions of floating in popular literature, and personal experiences. Although some of the references to scientific studies in the advertisements were relevant and up to date, it seems as if the information given was based on what has actually been studied or described, and not the extent to which the information is plausible. For example, some pilot studies indicating increase in creativity after floating were used as solid evidence that by floating creativity automatically was augmented. In this way the advertisements present a potpourri of possible effects that could occur when floating. What the advertisements lack, is clearer description of what usually happens when one floats. Also, it seems that unusual experiences in the float tank are highlighted (e.g. expansion of consciousness, being reborn anew), which creates a skewed picture of floating and also expectations, possibly attracting people looking for novel and intense experiences. Also several medical conditions said to be cured or helped by floating were presented but not always differentiated in terms of the degree to which floating would actually help. This can be misleading and appeal to people in desperate need for a solution to their health issues. Also, enhancements in performance across several areas (e.g. sports, creativity, learning) were presented in a way that seemed somewhat exaggerated, and seemed to attract people looking for a short-cut to self-development and success. Although, many of the statements of increased performance are scientifically founded [e.g. 23,24,49,50,55,63], they might not happen to everyone who floats, or perhaps only to a few under

very special circumstances [67]. Possibly, the most likely experience when floating is stress-reduction [12] and a moment of personal time. Another likely experience is pain-relief [15–18], a robust finding in the scientific literature on floating, which was often presented in the advertisements. The present study indicate that there is substantial discrepancies in the information on effects resulting from floating when comparing advertisements on the Internet to scientific evidence, highlighting the importance to further develop scientifically grounded sources of information regarding CAM therapies on the Internet.

## Limitations

One possible limitation of the present study is that all existing advertisements regarding flotation-REST on the Internet were not covered. The data collected from the Internet used specific keywords (given in Table 1), and the first hundred sites were examined, which leaves many sites on the Internet un-explored. Additionally, it is possible that we have missed some scientific evidence regarding effect from flotation-REST, although thorough searches have been made in the major scientific databases. Also both authors are experienced flotation-REST researchers and are continually updated regarding scientific findings in the field.

Another limitation is that the web-sites that the data was gathered from are limited to primarily United States of America, Sweden and England, which could indicate that conclusions regarding advertised effects from flotation-REST on the Internet in the present study comprises these countries only, although it seems plausible that the conclusions in this study can be generalized to other countries as well.

## Conflict of interest

No conflict of interest.

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