

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

Track and Field Athletes' Experiences and Perceived Effects of Flotation-REST: An
Interpretative Phenomenological Analysis

Ellinor Klockare

Karlstad University, Sweden

Henrik Gustafsson

Karlstad University, Sweden

Paul Davis

Northumbria University, United Kingdom

Carolina Lundqvist

The Swedish School of Sport and Health Sciences, Sweden

2015-04-25

Accepted for publication in *International Journal of Sport Psychology*.

This article may not exactly replicate the final version published in the journal. It is not the
copy of record.

Correspondence concerning this article should be addressed to Ellinor Klockare,
Vassmyrsgatan 4, 654 69 Karlstad, Sweden. Tel: +46-767812244. Email:
ellinor.klockare@gmail.com.

Abstract

Research has highlighted flotation-REST as a promising method for relaxation and performance enhancement in sport; however, to further evaluate the use of flotation-REST in an athletic environment, additional research is warranted. Semi-structured interviews were conducted with six elite track and field athletes about their experiences and perceived effects of flotation-REST. Athletes were interviewed twice; once for their immediate response and again to explore their perceptions of flotation-REST over time. The data was analyzed using interpretative phenomenological analysis. Flotation-REST was perceived as pleasant and relaxing. Five athletes reported less stress and an overall increase in well-being for one or two days afterwards, although they felt physically tired during training sessions. Being in a better mood, placing fewer demands on themselves, and feeling more optimistic and present were also perceived effects. This study shows the potential of flotation-REST as a technique for health promotion, stress management, and a means to practise mindfulness.

Keywords: sport psychology; relaxation; health promotion; stress management

1 Track and Field Athletes' Experiences and Perceived Effects of Flotation-REST: An
2 Interpretative Phenomenological Analysis

3 Psychological skills to cope with stress and maintain performance are acknowledged
4 to be central for athletes' success (Gould, Guinan, Greenleaf, Medbery, & Peterson, 1999;
5 Greenleaf, Gould, & Dieffenbach, 2001). Psychological skills training (PST) is commonly
6 used to enhance performance and well-being, and includes techniques such as goal setting,
7 imagery, self-talk, arousal regulation and relaxation (Hardy, Jones, & Gould, 1996; Vealey,
8 2007). Relaxation has been suggested to be a method to manage stress (Rumbold, Fletcher, &
9 Daniels, 2012) and enhance recovery (Kellmann, 2002). Flotation-REST (restricted
10 environmental stimulation technique) is one suggested relaxation method (Vealey, 2007); it
11 requires an individual to float inside a dark tank partly filled with skin-temperature, highly
12 concentrated saltwater in order to reduce external stimuli and increase physical and
13 psychological relaxation (Bood et al., 2006). However, the utility of flotation-REST in sport
14 psychology practice has not been comprehensively established in the research literature.

15 A number of studies have demonstrated flotation-REST as a promising technique in
16 order to decrease health problems (e.g., muscle pain, depression) and to improve sleep
17 quality, optimism, stress management and well-being (Bood et al., 2006; Bood, Sundequist,
18 Kjellgren, Nordström, & Norlander, 2007; Kjellgren, Sundequist, Norlander, & Archer, 2001;
19 van Dierendonck & Nijenhuis, 2005). In particular, lowered blood pressure, heart rate, and
20 muscle tension have been documented among participants after flotation-REST and may
21 underpin the observed psychological health benefits (Suedfeld & Borrie, 1999). Through self-
22 reports, participants have stated that they felt calmer, more alert and energetic after flotation-
23 REST, in addition to reporting reduced feelings of anxiety and stress (Suedfeld, Ballard, &
24 Murphy, 1983; Suedfeld & Eich, 1995) as well as a more positive mood state (Suedfeld &
25 Borrie, 1999). Individuals have demonstrated an increase in creativity directly after flotation-

1 REST (Norlander, Kjellgren, & Archer, 2003; Suedfeld, Metcalfe, & Bluck, 1987), whereas
2 measurements one week after flotation-REST showed no improvements in creativity
3 (Vartanian & Suedfeld, 2011); thus questions regarding the duration of the effects have
4 emerged. Moreover, an increasing improvement in well-being has been documented until the
5 12th floating session whereas additional sessions beyond this point did not induce any further
6 benefits (Bood et al., 2007). Many studies examining the efficacy of flotation-REST have
7 used control groups in order to compare flotation-REST and other relaxation techniques (e.g.,
8 chamber REST, progressive relaxation); across these multiple studies, flotation-REST has
9 been found to have the most positive effect on well-being and performance (e.g., Suedfeld &
10 Borrie, 1999; Suedfeld & Bruno, 1990; Suedfeld, Collier, & Hartnett, 1993).

11 Although most research on flotation-REST has focused on health issues, flotation-
12 REST has also been identified as a promising method for relaxation practice and performance
13 enhancement in sport. For example, participants have demonstrated improved performance
14 and higher technical ability after flotation-REST, compared to control groups, in basketball
15 (Suedfeld & Bruno, 1990; Wagaman, Barabasz, & Barabasz, 1991). On a dart throwing task,
16 participants who undertook flotation-REST were observed to significantly improve their
17 performance compared to a control group that did not show enhancements (Suedfeld et al.,
18 1993). Studies have shown performance enhancements after only one floating session
19 (Suedfeld et al., 1993); however a related study found that athletes who used flotation-REST
20 twice between competitions, in comparison to once, performed better (Wagaman et al.,
21 1991). Further, elite archers performed better and experienced a decreased exertion directly
22 after flotation-REST whereas non-elite archers did not improve noticeably (Norlander,
23 Bergman, & Archer, 1999). Flotation-REST in combination with imagery practice has also
24 been the focus of several studies; results have shown that participants who incorporated
25 imagery with flotation-REST improved their athletic performance significantly in comparison

1 to imagery only (McAleney, Barabasz, & Barabasz, 1990; Wagaman et al., 1991), or imagery
2 in combination with armchair rest (Suedfeld & Bruno, 1990) where the latter two did not
3 yield any significant enhancements.

4 In attempts to explain the positive effects of flotation-REST on athletes, researchers
5 have proposed two possible mechanisms (Suedfeld et al., 1993). First, athletes have reported
6 that through flotation-REST they have reached a deeper level of relaxation compared with
7 alternative relaxation techniques. Second, flotation-REST has been shown to increase the
8 athlete's ability to concentrate and direct their focus, both of which have been reported as
9 characteristic skills among successful athletes (Gould, Dieffenbach, & Moffett, 2002).
10 Flotation-REST shows promising potential for athletes, but additional research is of value to
11 gain more knowledge about the underlying mechanisms and to establish the most effective
12 protocol to implement this technique in sports.

13 Although studies have shown positive effects on performance and well-being after
14 flotation-REST (e.g., Norlander et al., 1999; van Dierendonck & Nijenhuis, 2005; Vartanian
15 & Suedfeld, 2011), knowledge of how individuals experience flotation-REST and what
16 effects they perceive is limited. Participants' experiences in the tank are particularly
17 important as flotation-REST is performed in a special milieu (i.e., in a dark saltwater tank)
18 that most people are initially unaccustomed to. Previous studies suggest that participants find
19 flotation-REST pleasant and enjoyable (e.g., Kjellgren, Lyden, & Norlander, 2008; Suedfeld
20 & Eich, 1995), whilst they experience deep relaxation that can potentially lead to falling
21 asleep in the tank (Sakata, Shinohara, Hori, & Sugimoto, 1995). However, further research is
22 necessary to gather more information regarding these outcomes, optimize the flotation-REST
23 experience, and gain additional insight pertaining to how flotation-REST might be used in
24 sport settings for performance enhancement and increased well-being among athletes. We
25 seek to gain a better understanding of athletes' experiences of flotation-REST with the aim of

1 identifying perceived underlying mechanisms that influence the efficacy of the modality.

2 Therefore, the aim of this study is to explore athletes' experiences and perceived effects of
3 flotation-REST, including both the immediate response and experience over time related to
4 their sport and everyday life.

5 Method

6 Participants

7 Six junior and first year senior elite athletes who used flotation-REST were
8 purposefully sampled (Smith & Osborn, 2003), and asked to participate in this study. The
9 research question focuses on the participants' experiences; therefore, the qualitative method
10 of interpretative phenomenological analysis (IPA; Smith, 1996) was chosen as IPA allows
11 researchers to explore the participants' experiences of a phenomenon as opposed to
12 examining the phenomenon itself or the cause of it (Smith & Osborn, 2003). A purposive
13 fairly homogeneous sampling method is preferable for IPA studies to enable interpretation
14 and analysis of the target subject whilst minimizing the number of extraneous variables
15 (Smith, Flowers, & Larkin, 2010). A small sample size enables researchers to explore the
16 subject in detail and focus on the participants' experiences and perceptions, in line with IPA
17 (Smith et al., 2010). The athletes, five female and one male, were between 17 and 23 years
18 old ($M = 19.7$ years, $SD = 2.34$) and were all competing in track and field at a national level
19 in Sweden (see Table 1). Alongside being elite athletes they were full time students in high
20 school or at university. Prior to their use of flotation-REST, the participants had little or no
21 experience of other relaxation techniques; additionally, they were not regularly or
22 systematically working with PST. To protect the participants' identities their names have
23 been changed.

24 Instrument

1 The athletes were offered flotation-REST through their sports club, once a week
2 during a time period of two months for the purpose of trying a relaxation technique in
3 combination with their ordinary track and field practice; none of the athletes had prior
4 experience of flotation-REST. Usage of flotation-REST amongst the athletes was a separate
5 activity from the present study; the present study does not include letting athletes use
6 flotation-REST but merely studying athletes' experiences and perceived effects of flotation-
7 REST. Whether the athletes wanted to partake in the present study or not did not affect their
8 use of flotation-REST which their sports club had arranged. The information provided by the
9 flotation-REST instructor was to try to relax as much as possible and some brief instructions:
10 if thoughts distracted the athletes they were suggested to focus on their breathing, count their
11 breaths, or try to let go of the thoughts. The flotation-REST tanks are sound and light isolated
12 and located in a darkened, quiet room. The water level is 30 cm deep and saturated with
13 magnesium sulphate in order for the individuals to float on their back, with their face above
14 the waterline. The water is heated to skin temperature (i.e., approx. 35°C). A session lasted 50
15 minutes, music was played in the beginning to help them relax and at the end to indicate that
16 the session was coming to an end. If needed the individuals could turn on a light inside the
17 tank or call for a staff member who was always nearby. The individuals could also easily
18 open the tank lid from the inside at any time. The athletes themselves decided how frequently
19 they wanted to partake in flotation-REST, as a result the number of sessions differ, between
20 two and six times, mainly due to scheduling considerations for the athletes.

21 **Design**

22 A qualitative inquiry was deemed appropriate to retrieve knowledge of the athletes'
23 personal experiences that might not otherwise emerge (Dale, 1996). Qualitative methods have
24 gained increased interest and acknowledged utility in order to develop professional practice
25 (Harper, 2008). The qualitative approach using IPA has recently gained increasingly

1 popularity in health and clinical psychology (Smith et al., 2010) and can be used to
2 investigate the process that individuals use to make sense of their life world and lived
3 experiences (Smith & Osborn, 2003). As such, providing an “insider perspective” (Harper,
4 2008) is particularly well suited for investigating the experiences of interventions such as
5 flotation-REST. By using IPA (Smith, 1996; Smith et al., 2010) the researcher can gain in-
6 depth understanding of the athletes’ experiences and it also enables the athletes to freely
7 share their thoughts, emotions, physical and psychological experiences, as well as perceived
8 effects of flotation-REST. In consideration of an IPA perspective (Smith et al., 2010) the
9 authors commenced this study with open-mindedness and flexibility as well as empathy and
10 curiosity to understand each participant’s view of flotation-REST. Further, it is
11 acknowledged that IPA research is complex, without predefined categories and comprises an
12 element of the researchers’ interpretations; the present study seeks to reflect the participants’
13 experiences as accurately as possible. Since the research topic is a novel area that concerns
14 well-being and health, whilst focusing on the participants’ understanding and sense-making
15 of a shared experience, IPA is especially suitable with its phenomenological approach
16 (Brocki & Wearden, 2006; Smith, 1996). Semi-structured interviews were used to provide the
17 athletes an opportunity to speak freely about their experiences. Semi-structured interviews
18 also allow the interviewer to be flexible and approach new relevant matters that arise during
19 the interviews and explore the subject in detail, all in keeping with Smith et al. (2010) and
20 IPA guidelines (Smith, 1996).

21 **Procedures**

22 Contact was first established with the track and field coach. The athletes were then
23 contacted in person by the first author before a floating session. In order to build rapport with
24 the participants and to learn about the flotation-REST procedure the first author, who
25 conducted all interviews, was an assistant at the flotation-REST tanks during the time of the

1 study. The respondents were informed of the nature of the study and reminded that
2 participation was voluntary. Informed consent was provided by all participants and by a
3 guardian when a participant was a minor, i.e., under 18 years of age. Each respondent was
4 interviewed on two different occasions. The first interview, lasting between 15 and 20
5 minutes, was conducted directly following a floating session. The purpose of the first
6 interview was to gain the respondent's immediate response to flotation-REST. The only
7 criterion was that it was not their first session of flotation-REST, so that they were familiar
8 with the procedures. Initial analyses of the first interview were conducted by the first author
9 to enable follow-up questions at the second interview. A second interview, lasting between
10 30 and 40 minutes, was then conducted with each participant at a time and place that was
11 convenient for the participant. The second interview focused on the respondent's overall
12 experience and perceived effects of flotation-REST. Due to competition season for the
13 athletes and in order to gather the participants' overall experiences from flotation-REST the
14 second interview was conducted a few months after the final floating session. The second
15 interview started with an informal conversation to again establish rapport (Smith et al., 2010).
16 All interviews were recorded, with the participants' permission.

17 **Interview Guides**

18 Two interview guides were developed, for the first and second interview respectively;
19 these consisted of mainly open-ended questions as well as possible probes and prompts
20 (Smith et al., 2010).¹ At the first interview each respondent was asked about their experience
21 in the recently completed floating session, how they felt directly following its completion and
22 to reflect on possible differences to earlier sessions. The longer second interview focused on
23 participants' experiences of flotation-REST and the subsequent effects from an overall

¹ The interview guides are available from the corresponding author upon request.

1 perspective. Finally, participants were provided the opportunity to share any additional
2 comments beyond those focused upon in the interview.

3 **Data Analyses**

4 Interviews were transcribed verbatim and IPA was undertaken by the first author in
5 keeping with Smith et al. (2010). Transcripts were read and reread to enhance the
6 understanding of the data. Exploratory notes were made regarding any points of interest
7 relating to content, context and language use; this practice is in line with Smith et al.'s
8 suggestions for producing a comprehensive and descriptive set of notes. Different themes and
9 categories were developed in an inductive manner and grouped together based on similarities
10 and connections. Differences in the notes and the emerging categories were also looked upon
11 to help organize the findings, as suggested by Smith et al. Further, Smith et al. recommend
12 that looking at the frequency of a certain category, as one indicator of the category's
13 importance, is of interest if the questions during the interview have been particularly open-
14 ended. For example, for this study comprised of mainly open-ended questions, the frequency
15 of findings regarding experiences of reduced stress was taken into consideration as the word
16 stress was not included in the interview guides. The procedures described above were
17 performed for each interview and then the categories from each participants' first and second
18 interview were combined. Next, patterns across cases and significant findings were
19 scrutinized. Throughout the analysis the original transcripts were regularly consulted. Finally,
20 two themes with categories emerged, and representative quotations were selected.

21 **Credibility**

22 The interviewer was experienced in the IPA methodology. To improve the study's
23 credibility member checking was performed with each participant (Flick, 2007). Through
24 member checking the collected data is checked for accuracy and verified (Cho & Trent,
25 2006). The second interview was also an opportunity to ensure the credibility of the results

1 from the first interview and enable clarifications to be made. Extracts from the transcripts are
2 provided in the results section to support the themes being identified and to allow readers to
3 examine the interpretations (Smith et al., 2010). The quotations were translated from Swedish
4 into English by the first author. In order to enhance the credibility of the translations a back
5 translation process was implemented (Geisinger, 2003) where the translated quotations were
6 translated back to Swedish by another Swedish person with a university education in English
7 and experience from studying in the US. The new Swedish translations were then compared
8 to the original quotations and adjustments were made in the English translations to ensure the
9 original meaning. Throughout the study memoing was practised where the interviewer
10 recorded reflective ideas and thoughts of the data collection and analysis as well as
11 observations from the interviews, adding to the trustworthiness of the study (Birks, Chapman,
12 & Francis, 2008; Groenewald, 2008).

13 **Results**

14 From the analysis two themes, with four and two categories respectively, emerged and
15 were related to the athletes' experiences of flotation-REST: experiences during flotation-
16 REST; and perceived effects of flotation-REST (see Table 2). For an overview of the results
17 the main sub-categories are also listed in the master table of the themes (see Table 2), and for
18 each respondent it is shown whether that sub-category was found in their case.

19 **Experiences During Flotation-REST**

20 When the athletes spoke about their experiences during flotation-REST the following
21 four categories emerged: the overall experience; how time was spent; the physical
22 experience; and thoughts in the tank.

23 **The overall experience.** Ella, Jennie, David, Ashley and Kate experienced flotation-
24 REST as positive, enjoyable overall, and looked forward to it. Ashley said: "It was very nice
25 during all sessions. It feels so pleasant to lie there." Jennie, Ashley, Ella, Kate and Laura each

1 described their lives as hectic, and they sometimes felt stressed about managing a schedule
2 full of activities, balancing both school and practice, as well as performing successfully. They
3 reported a desire to work more extensively with relaxation and PST, and described a great
4 need for it. Jennie especially articulated the need for relaxation both for herself and her
5 teammates as she had observed negative effects on performance linked to anxiety and
6 focusing problems:

7 There are several in my group who are a bit, well, a bit tense, or they are a little bit
8 stressed. And then it affects their performances at competitions and they get stuck. So
9 I think we would need relaxation, more regularly. [...] [At competitions] that's where
10 everything goes wrong. Because I'm fast and I'm strong, but at competitions I start to
11 think too much, so I need help to not think about those things.

12 However, following the use of flotation-REST Jennie expressed that she had experienced real
13 relaxation. "I've experienced what it's like to be truly relaxed" she said, referring to her
14 floating sessions. Laura was not as fond of lying in the tank as the others, due to feelings of
15 claustrophobia, but still thought it was okay. Even Kate, who really appreciated flotation-
16 REST, struggled at the beginning of her first sessions due to fear of water. She described:
17 "Overall, I'm pretty uncomfortable in water. So the first times it has really been 'Oh! I'm
18 lying in water. Oh, oh, oh!' And then you're supposed to relax mentally." However, after
19 Kate became used to lying in the water she felt secure. All athletes, except for Laura, reported
20 feeling secure in the environment of flotation-REST where they were isolated from the outer
21 world and not affected by different temperatures, lights etc. Ella expressed: "It has been
22 really nice. And especially that it shuts out a lot from outside, it's dark and there are not a lot
23 of things around you."

24 **How time was spent.** For all athletes, flotation-REST became a time for relaxation
25 and rest as Ashley stated: "I saw it as an opportunity to just relax and try to fall asleep almost

1 [...] that was very enjoyable.” Since none of the athletes had previous experience of
2 relaxation techniques, flotation-REST provided an opportunity to learn and practise
3 relaxation. For Ella, Jennie, Kate, Laura and Ashley this became an important aspect of their
4 floating sessions as they stated that they were not used to taking breaks in their everyday
5 lives. Flotation-REST, with its restricted environment, became a respite in their daily lives
6 when they could think, reflect, disconnect from stressful situations and have some free time
7 alone. Kate explained: “It has been a nice experience. I’ve had some time for myself. It’s not
8 so common for me to take a break in everyday life.”

9 During flotation-REST Laura, Kate, Jennie, Ashley and Ella reported falling asleep at
10 times, which mainly was considered pleasant. However, Kate, who slept through most of her
11 first sessions, had expected and hoped for a more active relaxation where she would still be
12 conscious:

13 I just fell asleep directly [...] and snored loudly, and that didn’t feel so amusing. [...]
14 Sleep, that you can do anywhere. So I felt a bit sad that I didn’t really make use of
15 that I was lying in this tank, floating with the right temperature and everything. I had
16 all these possibilities, and I just slept.

17 They further described how they kept falling in and out of consciousness. Ashley said: “I
18 sank very deep. I almost dozed off at times [...] I’m more awake and then I disappear again,
19 and then that repeats.” Ella recalled the feeling of not really knowing if she had been sleeping
20 or not: “I woke up even though I thought I wasn’t sleeping.” David, on the other hand, did
21 not sleep during flotation-REST but felt relaxed, although he struggled at times with
22 relaxation as he experienced the temperature to be too warm after a while, and had difficulties
23 relaxing for the entire 50 minutes. He reported feeling relaxed physically, but had difficulty
24 to not think about the drops of sweat on his forehead. Although David endeavoured to relax,
25 it did not improve and he said that he maybe had been too effortful in his attempts to relax:

1 The first times, I felt heavier and it was more pleasant [...] But then, the last times,
2 I've started to feel and think too much maybe, because I wanted to become more and
3 more relaxed, but it just didn't get any better.

4 **The physical experience.** All athletes experienced flotation-REST as being
5 physically positive and quickly became relaxed, despite the time it took for Laura and Kate to
6 adjust. After Kate became used to the water she explained how her floating sessions
7 facilitated her relaxation, she realized how (unknowingly) tense she was and how good it felt
8 to relax for a while:

9 It felt good in my body. You do feel quite tired when you actually relax like that.

10 Other times you don't think so much, you just go on, you work-out. So when you take
11 the time to relax you notice that "oh, how nice this was, to take some quiet time"

12 The athletes appreciated the feeling of weightlessness and not feeling the line between water
13 and air. Jennie expressed: "The contours are not there, so that was a very cool feeling too,
14 that you sort of [*pause*] There was no water or air, it was just very, floating."

15 Ella and Kate reported experiencing twitches, or "discharges" as Ella labelled them, in
16 their legs. An explanation for the muscle twitches was unknown to the athletes, but they
17 thought it might be connected to experiencing deep physical relaxation. The twitches came as
18 a surprise and stirred up the water. Kate spoke of her twitches: "I still remember it like it was
19 yesterday. I jerked awake, and I just 'slosh' and then a big hurricane, storm. It was a little bit
20 scary, but still quite nice."

21 **Thoughts in the tank.** David, Ella and Jennie reported thinking extensively during
22 flotation-REST, whereas Kate, Ashley and Laura did not experience many thoughts. Yet, all
23 athletes indicated that it was hard to control their thoughts, and that they could suddenly and
24 unexpectedly come to think about a wide range of topics. However, many thoughts were
25 related to recent personal events, flotation-REST, track and field, or general relaxation as

1 expressed by Jennie: “You can’t control what you think about. It just comes a lot of thoughts.
2 [...] It was all sorts of things. But it was a lot of track and field and learning how to relax.”

3 All athletes reported positive expectations prior to undertaking flotation-REST. Kate
4 described the following when recalling her thoughts during flotation-REST:

5 I think a lot about practice when I’m lying there. Since you’re there for a training
6 purpose, kind of. [...] I have thought that, you know, it’s for relaxation and recovery.
7 So I have really felt that “how nice, today I will recover”, and I have always thought
8 that “in the long run, it will be really good”

9 Jennie explained how her thoughts shifted and that she used imagery:

10 I was just lying there, thinking about how cool it was that I was floating. And then I
11 started to think about track and field and that I should be as relaxed as I was in the
12 tank. And then I tried to picture a successful competition and that I was relaxed like
13 that. Then I just floated away in my mind. [...] I woke up by the music in the end.
14 And then I was thinking that I was out in the middle of the ocean, floating. That was
15 very nice [...] it was like freedom.

16 Some thoughts were also connected to internal or external sounds. Jennie and Laura
17 especially spoke about how the sounds of their heartbeat and breathing became very strong.
18 Laura even got a bit annoyed at one point: “It pulsates. It’s scary when you hear just how
19 [pause] I think that can be quite disturbing when you lie there, trying to relax, and you hear.”
20 The external sounds, which four athletes mentioned, were from the corridor nearby. They
21 registered the sounds but did not report getting disturbed by it.

22 The athletes perceived it to be relaxing and enjoyable not having to think about
23 anything specifically, and when thoughts arose all of the athletes attempted to “let go” of
24 them as they had been recommended. Ashley described how her thoughts just came and went
25 again: “You do have thoughts, but they just float away, so I don’t think about that, that I’m

1 lying there thinking. Instead I relax and let the thoughts come and go. [...] That was very
2 relaxing.” However, it was not always easy to let go of thoughts and at times having many
3 thoughts became stressful. To relax and direct their focus, all athletes tried the counting and
4 breathing tips they had received, and mostly it helped as Laura expressed: “I’ve tried to count
5 [...] one and then breath, and two. I’ve tried that most of the times and that has worked [...]”
6 It’s easier when I do that, I think, than just lying down, wondering when I’ll relax.”

7 **Perceived Effects of Flotation-REST**

8 After flotation-REST all athletes reported feeling some effects during the following
9 hours or days. Two categories emerged: physiological effects; and psychological effects.

10 **Physiological effects.** During the first hours after flotation-REST all athletes felt
11 physically relaxed. However, the specific feeling physically was described differently among
12 the athletes. Ashley expressed: “I felt just more relaxed and very pleasant physically, light
13 and relaxed sort of. More alert in some way, directly afterwards [...] like I’d been sleeping
14 for a long time and just starting to wake up. Very very nice.” and Jennie described: “I
15 experienced a tired feeling in my body, in the muscles in particular. It wasn’t like I felt
16 energized and alert physically. It was more, you know, tired and heavy.” Predominantly,
17 flotation-REST was completed in the morning with training sessions in the afternoon. Ella,
18 Ashley, Jennie, Kate and Laura reported often feeling tired at the beginning of their work-out
19 and that their bodies did not respond as they were used to. Only David did not experience any
20 effects during the rest of the day, stating: “I felt a bit heavy physically when I got out of the
21 tank. But that passed pretty quickly. [...] It hasn’t affected me the rest of the day.” The other
22 five athletes described feeling tired several hours after flotation-REST. Ashley explained:

23 I was a wreck when I got home. I was really tired and just had to lie down and sleep
24 for a while. And then we had practice. [...] I was really tired [...] mentally but also

1 physically. I think it was because I had a hard time getting my energy up like usual,
2 because I was rather relaxed.

3 Laura also recalled feeling tired at practice the first time, however, the more she got used to
4 flotation-REST the less tired she felt afterwards:

5 I was completely exhausted the first time. The whole day was ruined. I was suppose
6 to go to practice later but “no, it won’t work”. But then it has gotten better and better,
7 I feel. The last time I wasn’t at all as tired. [...] So I think it was only a shock for the
8 body to relax.

9 Ashley, Ella, Jennie, Kate and Laura experienced that the perceived physiological effects
10 lasted a day, at most. External factors, from their everyday life, as well as expectations and
11 raised awareness affected the perceived physiological effects. After flotation-REST they
12 reflected more on how they felt physically, as described by Ella although she still tried to
13 perform as usual: “I’ve certainly analyzed it, quite a bit, like ‘Am I more alert? Am I more
14 tired?’ [...] But when I had practice, I still tried not to think about it and let it affect me.”
15 However, the athletes were not the only ones who had expectations of possible physical
16 effects. Jennie described how their coach had spoken to them after flotation-REST: “We had
17 intervals the day after and then our coach said to us ‘You might feel a little tired now during
18 the intervals.’ But I don’t think I felt anything.”

19 **Psychological effects.** Directly after flotation-REST all athletes perceived positive
20 psychological effects; overall, they reported a pleasant, relaxed feeling. However, at times
21 they were relaxed to the point that they felt lethargic, but predominantly rested and alert.
22 Laura explained the feeling after her sessions: “I’ve been pretty vigorous. For once, I was
23 about to say. No, but mentally it feels so much better then before I go into the tank. I feel
24 greater vitality.” Ella also described this: “I become calmer. It just feels better. That’s
25 probably the biggest difference.”

1 Ella, Laura, Kate and Ashley perceived psychological effects for two days after
2 flotation-REST, Jennie perceived effects for one day and David only for a few hours. David
3 was also the only one who stated that he did not perceive much stress in his daily life or sport
4 performance. David described the effects as relatively minor compared to the other five
5 athletes; they reported feeling considerably calmer and less stressed afterward, and as they
6 outlined that they felt their lives were hectic these calm feelings were appreciated. When
7 comparing the tired physiological feeling and the relaxed psychological effect Laura said:
8 “The tired feeling disappeared pretty quickly. But the relaxed feeling was there for at least
9 two days.” After flotation-REST one early Monday morning before school Kate said:

10 It feels like I’ve slept for like 12 hours and have a peaceful day ahead of me, a
11 Saturday or something. And it feels pretty slow. I wonder if you get into a different
12 frame of mind all day [...] it does feel hard to rush afterwards. [...] It feels nice. It’s
13 not exactly usual for me to just chill out and take my time.

14 Ashley, Ella, Jennie, Kate and Laura perceived reaching a tranquil state afterwards as
15 illustrated by Ella: “You just ‘Yes, now I’ve entered the calm’” While feeling less stressed
16 and worried Laura perceived fewer demands in her daily life. She had also struggled with
17 performance anxiety, so being able to let go of stressful thoughts became especially important
18 to her. She explained:

19 As a person I’m pretty stressed, like “now I need to get home and study and do this
20 and that, and this thing and that” When I get out [of the tank] I’m just not bothered by
21 it, I’m more relaxed [...] I’m not as stressed.

22 And she continued:

23 I don’t have the same demands on myself as I did before I went into the tank.
24 Somehow I’ve managed to disconnect from that. [...] You just don’t have the energy
25 no, to stress. So that’s really good. [...] For me it’s different actually. You become

1 calmer. [...] I don't think about everything I have to do, or, things I in fact don't have
2 to do. [...] I'll deal with it when I need to. I don't know how to explain it otherwise.
3 More in harmony.

4 Further, Kate and Laura reported feeling more content, focused and present in their
5 lives afterwards. Kate explained how she became more attentive:

6 When I walked out of there I just felt very calm [...] more aware, and I really saw
7 things. Before, well, then I was just walking by. But I think I get a bit more attentive
8 [...] like, Carpe Diem, and really try to live the day fully. [...] I've probably not been
9 as stressed as I usually am.

10 Kate, Jennie and Laura also stated that flotation-REST had raised their awareness of
11 how psychological skills and relaxation affect and play an important part in their sport
12 performance and lives. During their sessions they had experienced deep relaxation and been
13 able to just focus on themselves, and afterwards, as they had felt less stressed, more present,
14 and embraced these effects, they had reflected more on how relaxation and sport performance
15 are connected. Kate explained: "I've become more aware of what it all means, the full picture
16 with recovery, practice and the psychological aspects. So it feels like I've gotten better at
17 taking it seriously, that it is actually important." Kate also noticed a change in her mood after
18 flotation-REST, feeling more joyful and optimistic, stating that she was:

19 Feeling happier. That's probably it. And that's related to the fact that I feel that I'm
20 more attentive to things, and I enjoy everything a little bit more [...] I become more
21 positive towards just everyday things [...] yes, a little happier and more positive.

22 Ella felt more energized as if she had more psychological resources to take on the day: "I
23 have this calm feeling. And well, I do believe that you have some more strength to handle the
24 things you need to do later." Kate also explained that directly afterwards she experienced
25 time differently: "I feel like I do everything as usual, but still time passes very quickly. For

1 example, when I showered [...] 15 minutes, just like that. Felt like five. [...] That was the
2 same after every session.”

3 Ashley, Ella, Jennie, Kate and Laura believed that the perceived psychological
4 effects, in addition to the physiological effects, were affected by other circumstances and
5 their own expectations. After flotation-REST they were pleased they had invested time in
6 relaxation as they believed it had positive effects on their lives as well as their sport
7 performance. Kate described: “When you’ve actually taken the time, you feel ‘now I’ve done
8 something positive, now everything will be good’ and then it gets good and it builds on and
9 becomes this wonderful spiral of it all,” she continued: “I think it’s more mentally. That you
10 believe that you’ve actually restored the energy, and then your outlook is ‘now I’m rested,
11 now it’s all good’. And that helps you perform better later at practice.” On the whole, they
12 perceived more psychological effects of flotation-REST and longer-lasting than physiological
13 effects. Ella said: “It’s more that you become rested mentally, than rested physically.”

14 **Discussion**

15 The present study examined elite track and field athletes’ experiences and perceived
16 effects of flotation-REST. Each of the six athletes considered flotation-REST to be relaxing
17 and pleasant, but that circumstances in their general lives affected the experience, similar to
18 previous research in flotation-REST (Kjellgren et al., 2008). Overall, the restricted
19 environment of flotation-REST helped the athletes to relax and disconnect from events and
20 thoughts related to their daily lives. During the day after flotation-REST five athletes felt
21 relaxed and tired physically. The findings are consistent with previous research (Kjellgren et
22 al., 2008) and add the context of an athletic environment. They described feeling slow during
23 training sessions, and sometimes performing below their standard level of performance which
24 implies that the acute effects of flotation-REST were potentially debilitating to performance.
25 Although previous research has shown performance enhancements in sports after flotation-

1 REST (e.g., McAleney et al., 1990; Wagaman et al., 1991) the findings from the present
2 study indicate that it could be of interest for further research to explore during which phase of
3 training programs and competition preparations flotation-REST would be most effective. The
4 athletes also reported reflecting more on how they felt at practice after flotation-REST and
5 one athlete reported that their coach at one practice had suggested that they might feel tired
6 physically. Thus, it is hard to distinguish between the impact of flotation-REST and their
7 expectations. Further, five athletes reported sometimes falling asleep during flotation-REST,
8 which might have also affected the perceived effects among the athletes.

9 Five athletes reported that the perceived psychological effects were more positive and
10 persistent than the perceived physiological effects. For up to two days after flotation-REST,
11 the five athletes perceived increased well-being, felt less stressed and less likely to become
12 stressed. These five athletes also reported that they felt stressed in their lives in general, and
13 flotation-REST provided required respite. The one athlete who did not experience any
14 particular effects did not feel as relaxed in the tank as the others, and described himself as not
15 generally stressed prior to undertaking the treatment. Whether the results observed in the
16 present study were influenced by the specific life circumstances reported by participants,
17 their personalities, or that flotation-REST did not suit particular individuals, is difficult to
18 conclude (and beyond the scope of the research design of this study). However the relaxation,
19 comprised of the mental and physical time-out in the flotation-REST tank, might have helped
20 stressed athletes to place fewer demands on themselves resulting in a better mood, and
21 becoming more optimistic, present and attentive. Previous research has also shown that
22 participants have perceived reduced life pressure and also felt less likely to become stressed
23 after flotation-REST (Suedfeld & Borrie, 1999). Thus, it appears that flotation-REST can
24 help prevent emotional and physical exhaustion in sports and by extension may also be a

1 valuable method for reducing perceptions of stress and ultimately reduce the risk of burnout
2 (Gustafsson, Kenttä, & Hassmén, 2011).

3 The athletes' descriptions of the effects of flotation-REST proposes that flotation-
4 REST increased their ability to be mindful, not only during the time in the tank but also
5 afterwards in their everyday life. Mindfulness is characterised by an individual non-
6 judgementally observing thoughts, feelings and sensations from moment to moment and is
7 often obtained through meditation (Bishop et al., 2004). Mindfulness practice has recently
8 been proposed to compliment PST as it can be used to enhance the application of
9 psychological skills training techniques and improve preparation for PST (Birrer, Röthlin, &
10 Morgan, 2012). For further research it could be of interest to examine the possibility of
11 complementing flotation-REST with mindfulness practice, and whether mindfulness practice
12 could influence, prolong or deepen the perceived effects of flotation-REST. The findings in
13 the present study might also support the proposition that flotation-REST increases athletes'
14 concentration ability (Suedfeld et al., 1993). In the present study, three athletes reported
15 feeling more vigorous and attentive as well as experiencing less worry during the following
16 days after flotation-REST. These findings share similarities with mindfulness research that
17 has reported reductions in stress, rumination about negative thoughts and emotions as well as
18 increased awareness and well-being (Birrer et al., 2012; Brown, Ryan, & Creswell, 2007;
19 Gardner & Moore, 2004). Therefore, it is plausible that flotation-REST could be a method for
20 becoming more aware of one's thoughts and practising mindfulness. Importantly, although
21 most athletes in this study felt more energized, calm and relaxed after flotation-REST, two
22 athletes reported that flotation-REST had the potential to evoke unpleasant thoughts and
23 emotions, for instance feelings of claustrophobia. The qualitative approach used in this study
24 enabled these findings to emerge, and offers one explanation why previous studies have not
25 consistently found positive effects of flotation-REST (e.g., Norlander et al., 1999). The

1 variability of experiences and subsequent outcomes of flotation-REST amongst athletes
2 suggests further investigation is warranted; future research is required to explore moderating
3 variables and the conditions in which flotation-REST is most effective.

4 **Limitations**

5 The number of floating sessions differed amongst the athletes; however, it was
6 deemed relevant and important to include athletes who had undertaken flotation-REST only a
7 few times as they offered useful insight that was not influenced by prolonged use and had not
8 grown accustomed to the unique (lack of) stimuli inherent to flotation-REST. There did not
9 seem to be any significant differences depending on the number of sessions and previous
10 research has reported effects after only one session (e.g., Suedfeld & Bruno, 1990; Suedfeld
11 et al., 1993); however, additional sessions might have affected the outcome. Interviewing
12 participants after other number of sessions of flotation-REST might also be interesting for
13 future research to gain more understanding of the flotation-REST experience and possible
14 effects. Inherent to the research method of conducting interviews is the risk that respondents
15 want to provide overly positive answers. That said, the results in the present study highlight
16 similar findings as previous research on flotation-REST. Interviewing the respondents on two
17 different occasions also enabled for a deeper understanding of the respondents' experiences.
18 Further, to gain more knowledge about the outcomes of flotation-REST and explore possible
19 correlations, for example between stress levels and perceived effects of flotation-REST, or
20 between sport performance and perceived physiological effects, mixed methods research
21 might be of interest. Besides interviews, physiological tests or questionnaires measuring
22 stress or sport performance more specifically might be valuable here.

23 **Conclusion and Practical Implications**

24 In conclusion, the present study has collected in-depth information on athletes'
25 experiences and perceived effects of flotation-REST. The findings add to the limited research

1 on individuals' experiences and perceived effects of flotation-REST, and specifically the use
2 of flotation-REST in an athletic environment. IPA enabled the exploration of the
3 respondents' experiences in detail and provided an insight that would not have been gained
4 through the use of a positivist research design. Consistent with previous research on flotation-
5 REST, five out of six athletes in the present study reported increased well-being and less
6 stress after flotation-REST. The potential for flotation-REST to be used as a technique for
7 health promotion, stress management, and a way to practise mindfulness among athletes is
8 tentatively supported. However, the results revealed considerable individual differences
9 across participants. The variability of the athletes' perceived effects of flotation-REST
10 indicates the importance of individualized training and recovery programs, and the need for
11 further research on the modality.

References

- 1
2 Birks, M., Chapman, Y., & Francis, K. (2008). Memoing in qualitative research: Probing data
3 and processes. *Journal of Research in Nursing, 13*, 68-75.
- 4 Birrer, D., Röthlin, P., & Morgan, G. (2012). Mindfulness to enhance athletic performance:
5 Theoretical considerations and possible impact mechanisms. *Mindfulness, 3*, 235-246.
- 6 Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., ... Devins, G.
7 (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science
8 and Practice, 11*, 230-241.
- 9 Bood, S. Å., Sundequist, U., Kjellgren, A., Nordström, G., & Norlander, T. (2007). Effects of
10 flotation REST (restricted environmental stimulation technique) on stress related
11 muscle pain: Are 33 flotation sessions more effective than 12 sessions? *Social
12 Behavior and Personality, 35*, 143-156.
- 13 Bood, S. Å., Sundequist, U., Kjellgren, A., Norlander, T., Nordström, L., Nordenström, K., &
14 Nordström, G. (2006). Eliciting the relaxation response with the help of flotation-
15 REST (restricted environmental stimulation technique) in patients with stress-related
16 ailments. *International Journal of Stress Management, 13*, 154-175.
- 17 Brocki, J. M., & Wearden, A. J. (2006). A critical evaluation of the use of interpretative
18 phenomenological analysis (IPA) in health psychology. *Psychology and Health, 21*,
19 87-108.
- 20 Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations
21 and evidence for its salutary effects. *Psychological Inquiry, 18*, 211-237.
- 22 Cho, J., & Trent, A. (2006). Validity in qualitative research revisited. *Qualitative Research*,
23 6, 319-340.
- 24 Dale, G. A. (1996). Existential phenomenology: Emphasizing the experience of the athlete in
25 sport psychology research. *The Sport Psychologist, 10*, 307-321.

- 1 Flick, U. (2007). *Managing quality in qualitative research. The SAGE qualitative research*
2 *kit*. Thousand Oaks, CA: SAGE Publications.
- 3 Gardner, F. L., & Moore, Z. E. (2004). A mindfulness-acceptance-commitment-based
4 approach to athletic performance enhancement: Theoretical considerations. *Behavior*
5 *Therapy, 35*, 707-723.
- 6 Geisinger, K. F. (2003). Testing and assessment in cross-culture psychology, In J. R. Graham
7 & J. A. Naglieri (Eds.), *Handbook of psychology* (Vol. 10, pp. 95-118). Hoboken, NJ:
8 Wiley.
- 9 Gould, D., Dieffenbach, K., & Moffett, A. (2002). Psychological characteristics and their
10 development in Olympic champions. *Journal of Applied Sport Psychology, 14*, 172-
11 204.
- 12 Gould, D., Guinan, D., Greenleaf, C., Medbery, R., & Peterson, K. (1999). Factors affecting
13 Olympic performance: Perceptions of athletes and coaches from more and less
14 successful teams. *The Sport Psychologist, 13*, 371-394.
- 15 Greenleaf, C., Gould, D., & Dieffenbach, K. (2001). Factors influencing Olympic
16 performance: Interviews with Atlanta and Nagano US Olympians. *Journal of Applied*
17 *Sport Psychology, 13*, 154-184.
- 18 Groenewald, T. (2008). Memos and memoing. In L. M. Given (Ed.), *The SAGE encyclopedia*
19 *of qualitative research methods* (Vol. 2, pp. 505-506). Thousand Oaks, CA: SAGE
20 Publications.
- 21 Gustafsson, H., Kenttä, G., & Hassmén, P. (2011). Athlete burnout: An integrated model and
22 future research directions. *International Review of Sport and Exercise Psychology, 4*,
23 3-24.
- 24 Hardy, L., Jones, G., & Gould, D. (1996). *Understanding psychological preparation for*
25 *sport: Theory and practice of elite performers*. Chichester, UK: Wiley.

- 1 Harper, D. (2008). Clinical psychology. In C. Willig & W. Stainton Rogers (Eds.), *Handbook*
2 *of qualitative research methods in psychology* (pp. 430–454). London: Sage.
- 3 Kellmann, M. (2002). Underrecovery and overtraining: Different concepts - same impact? In
4 M. Kellmann (Ed.), *Enhancing recovery: Preventing underperformance in athletes*
5 (pp. 3-25). Champaign, IL: Human Kinetics.
- 6 Kjellgren, A., Lyden, F., & Norlander, T. (2008). Sensory isolation in flotation tanks: Altered
7 states of consciousness and effects on well-being. *The Qualitative Report, 13*, 636-
8 656.
- 9 Kjellgren, A., Sundequist, U., Norlander, T., & Archer, T. (2001). Effects of flotation-REST
10 on muscle tension pain. *Pain Res Manage, 6*, 181-189.
- 11 McAleney, P. J., Barabasz, A., & Barabasz, M. (1990). Effects of flotation restricted
12 environmental stimulation on intercollegiate tennis performance. *Perceptual and*
13 *Motor Skills, 71*, 1023-1028.
- 14 Norlander, T., Bergman, H., & Archer, T. (1999). Primary process in competitive archery
15 performance: Effects of flotation REST. *Journal of Applied Sport Psychology, 11*,
16 194-209.
- 17 Norlander, T., Kjellgren, A., & Archer, T. (2003). Effects of flotation-versus chamber-
18 restricted environmental stimulation technique (REST) on creativity and realism
19 under stress and non-stress condition. *Imagination, Cognition and Personality, 22*,
20 343-359.
- 21 Rumbold, J. L., Fletcher, D., & Daniels, K. (2012). A systematic review of stress
22 management interventions with sport performers. *Sport, Exercise, and Performance*
23 *Psychology, 1*, 173-193.

- 1 Sakata, S., Shinohara, J., Hori, T., & Sugimoto, S. (1995). Enhancement of randomness by
2 flotation REST (restricted environmental stimulation technique). *Perceptual and*
3 *Motor Skills, 80*, 999-1010.
- 4 Smith, J. A. (1996). Beyond the divide between cognition and discourse: using interpretative
5 phenomenological analysis in health psychology. *Psychology and Health, 11*, 261–
6 271.
- 7 Smith, J. A., Flowers, P., & Larkin, M. (2010). *Interpretative phenomenological analysis:*
8 *Theory, method and research*. Thousand Oaks, CA: SAGE Publications.
- 9 Smith, J. A., & Osborn, M. (2003). Interpretative phenomenological analysis. In J. A. Smith
10 (Ed.), *Qualitative psychology: A practical guide to research methods* (pp. 51-80).
11 London: SAGE Publications.
- 12 Suedfeld, P., Ballard, E. J., & Murphy, M. (1983). Water immersion and flotation: From
13 stress experiment to stress treatment. *Journal of Environmental Psychology, 3*, 147-
14 155.
- 15 Suedfeld, P., & Borrie, R. A. (1999). Health and therapeutic applications of chamber and
16 flotation restricted environmental stimulation therapy (REST). *Psychology and*
17 *Health, 14*, 545-566.
- 18 Suedfeld, P., & Bruno, T. (1990). Flotation REST and imagery in the improvement of athletic
19 performance. *Journal of Sport & Exercise Psychology, 12*, 82-85.
- 20 Suedfeld, P., Collier, D. E., & Hartnett, B. D. G. (1993). Enhancing perceptual-motor
21 accuracy through flotation REST. *The Sport Psychologist, 7*, 151-159.
- 22 Suedfeld, P., & Eich, E. (1995). Autobiographical memory and affect under conditions of
23 reduced environmental stimulation. *Journal of Environmental Psychology, 15*, 321-
24 326.

- 1 Suedfeld, P., Metcalfe, J., & Bluck, S. (1987). Enhancement of scientific creativity by
2 flotation REST (restricted environmental stimulation technique). *Journal of*
3 *Environmental Psychology*, 7, 219-231.
- 4 van Dierendonck, D., & Nijenhuis, J. T. (2005). Flotation restricted environmental
5 stimulation therapy (REST) as a stress-management tool: A meta-analysis.
6 *Psychology and Health*, 20, 405-412.
- 7 Vartanian, O., & Suedfeld, P. (2011). The effect of the flotation version of restricted
8 environmental stimulation technique (REST) on jazz improvisation. *Music and*
9 *Medicine*, 3, 234-238.
- 10 Vealey, R. S. (2007). Mental skills training in sport. In G. Tenenbaum & R. C. Eklund (Eds.),
11 *Handbook of sport psychology* (3rd ed., pp. 287-309). Hoboken, NJ: John Wiley &
12 Sons.
- 13 Wagaman, J. D., Barabasz, A. F., & Barabasz, M. (1991). Flotation REST and imagery in the
14 improvement of collegiate basketball performance. *Perceptual and Motor Skills*, 72,
15 119-122.

1 Table 1

2 *Demographic Details of Participants*

Respondent	Sex	Age	Event	Total number of floating sessions = Session-number for the first interview
Ashley	Female	23	Long jump, sprint	3
David	Male	17	Long jump, triple jump	4
Ella	Female	19	Heptathlon	6
Jennie	Female	18	Hurdles, sprint	2
Kate	Female	19	Hurdles, long jump, sprint	4
Laura	Female	22	Long jump, triple jump	3

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

1 Table 2

2 *Master Table of the Themes*

Themes	Categories	Main sub-categories	Ashley	David	Ella	Jennie	Kate	Laura
Experiences during fl.-REST	The overall experience	Felt safe and enjoyed it	X	X	X	X	X	
	How time was spent	Fl.-REST meant relaxation practice	X	X	X	X	X	X
		Fl.-REST meant a breather in an otherwise hectic life	X		X	X	X	X
		Slept	X		X	X	X	X
	The physical experience	Positive and relaxing	X	X	X	X	X	X
Thoughts in the tank	A lot of thoughts		X	X	X			
Perceived effects of fl.-REST	Physiological effects	Tired at practice	X		X	X	X	X
		Psychological effects	Felt less stressed and more calm	X		X	X	X
	Increased well-being	Effects for one or two days	X		X	X	X	X

3 *Note: Fl.-REST = Flotation-REST. "X" means that the result was found in that respondent's case.*

4