“It's the experience, it's not exercise”: Blue Therapy for health and mental well-being among adults in the UK

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Abstract

Background: Blue Therapy, or cold-water swimming, is an increasingly popular activity associated with enhanced well-being, improved mood, and reduced anxiety. However, the mechanisms that produce these outcomes are unclear. The aim of this study was to explore experiences practicing Blue Therapy from a sample of adults in the United Kingdom.

Method: Semi-structured interviews (n=7; self-identified females=6, male=1; M_{age}=49.17) were conducted. Participants were recruited through snowball and purposive sampling. The data was analysed using Interpretative Phenomenological Analysis.

Results: Final superordinate themes, *Benefits to Blue Therapy* and *Therapeutic Ritual*, identified key mechanisms underlying cold swimming for health and well-being. For example, sea swimming appeared to improve physical health and reduced pain, enhanced mood, and emotional control. Sea swimming generated social connections and a sense of belonging to a community suggesting key psychosocial benefits. The ritualistic nature of cold-water swimming facilitated introspection, boosted confidence, and enhanced physical and psychological resilience. Lastly, participants reported a deeper connectedness to nature.

Conclusions*:* This qualitative study suggests cold-water swimming generates outcomes related to eudaimonic well-being such as enhanced relationships, personal growth, self-acceptance, and connection to nature. The findings can be used to inform health promotion programs as a prevention health measure or for people with chronical physical and mental disorders and be used as a form of ecotherapy to improve mental well-being.

Keywords: Blue therapy; Cold-water swimming; Ecotherapy; Eudaimonic well-being

Introduction

Open water, sea, or wild swimming, also called *Blue Therapy* (Van Tulleken et al., 2018) is the physical activity of swimming or immersing in cold (<15°C) to ice-cold water (<5°C) for enhancing health and mental well-being (Knechtle et al., 2020; McDougall et al., 2022; Tipton et al., 2017). It also includes exposure to blue spaces such as oceans, rivers, lakes, ponds, and lidos (McDougall et al., 2022; Knechtle et al., 2020). Though used therapeutically for centuries (Knechtle et al., 2009; Tipton et al., 2017), it has recently gained popularity as an alternative health and wellness practice (McDougall et al., 2022). Research on the therapeutic potential of cold-water swimming is novel and relatively under studied (Massey et al., 2022; Shevchuk, 2008; Van Tulleken et al., 2018). However further evidence is needed to support its value as an alternative therapy.

Several quasi-experimental studies have found that cold-water swimmers have a reduction in poor mood, improved general well-being and reduction of pain as compared to non-swimmers (Huttunen et al., 2004; Massey et al., 2020; Massey et al., 2022). Other studies found improvement of self-esteem, vigour, reduce anger and tension and improvement for musculoskeletal injury and cardiovascular related conditions (Massey et al., 2022). A mixed method study identified psychosocial benefits of cold-water swimming to improve social support and social bonding (Burlingham et al., 2022). While a survey study conducted by Wood et al. (2022) identified freedom, physical fitness, and connectedness to nature as the most important well-being indicators associated with cold-water swimming. In addition, swimming more than twice a week was associated with increased social benefits and swimming in marine sites was associated with enhanced spirituality and connectedness to nature (Wood et al., 2022).

Existing qualitative studies have identified key psychosocial and well-being benefits related to the experience of cold-water swimming (Burlingham et al., 2022; Denton & Aranda, 2020; McDougall et al., 2022; Sam, 2020; Van Tulleken et al. 2018). To start, several studies highlight the importance of socialising as it creates solidarity and joy from shared experiences, extending to social activities outside of swimming (e.g., coffee and talking) (McDougall et al., 2022; Sam, 2020). Additionally, cold-water swimming appears to produce a state of mindfulness and reflection by way of guided immersion and breathing exercises to help adjust to the cold water. Other results demonstrated that cold water

swimming can improve connectedness to nature or to a higher purpose (Burlingham et al., 2022; Denton & Aranda, 2020; Sam, 2020). Alternatively, finding courage to overcome anxiety about cold-water shock in the rough marine conditions can provide a sense of pride, relief, boosted confidence, and feeling in control (Burlingham et al. 2022; McDougall et al. 2022; Sam 2020; Van Tulleken et al. 2018). Case studies suggested improvement in mood, leading to some participants to discontinue anti-depressants (Van Tulleken et al., 2018), while those who experienced pain ceased using opiate medication after engaging in swimming (Mole & Mackeith, 2018).

In summary, cold-water swimming appears to provide psychosocial and physiological benefits, however, research has not explored the underlying mechanisms of cold-water swimming to support claims regarding its therapeutic value for health and well-being. In addition, limited research exists on the direct experience of being a part of a sea swimming community (Denton & Aranda, 2020) and how experiences are shaped by variety of blue spaces (e.g. sea, rivers, lakes) (Wood et al., 2022). Understanding the mechanisms underneath these key indicators is important to translate Blue Therapy benefits into real-world practice. The aim of this study was to identify the mechanisms of cold-water swimming as a type of Blue Therapy for health and well-being based on first-hand experience. Limited research has been conducted in the UK (Bird et al., 2015; Massey et al., 2022; Wood et al., 2022), the country's generally cool open water temperatures could potentially facilitate year-round accessibility to cold-water swimming and active swimmers for this study. The research question is *What are the experiences of using Blue Therapy for health and mental well-being in the United Kingdom?*

Methods

Design

This was a qualitative study using semi-structured one-to-one interviews to identify the mechanisms of cold-water swimming for health and mental well-being.

Participants

Data was collected in May-June 2023 from N=7 open cold-water swimmers; 6 self-identified females and 1 male (M_{age}=49.17; SD=11.94). All of the participants reported being from white ethnic background, being employed and with an annual income range between

£7k and £100k. Participants resided in area across the south and south-western UK (Bicester, Bristol, London, and Weymouth). Participants reported practicing cold-water swimming for an average of 3.5 years. A combination of snowball sampling (Naderifar et al., 2017) and purposive sampling (Campbell et al., 2020) was used to recruit participants. In terms of snowball sampling, the researcher used their personal contacts to suggest other cold-water swimmers to take part in the study (See Supplement 1 reflexive account discussing the relationship between the participants and the researcher). To meet purposive sampling criteria, all participants had to be at least 18 years old, reside in the UK, and have access to a smart phone or laptop to take part in the online interviews. In addition, as cold-water swimming is mainly a seasonal activity, the participants in this study must have used cold-water swimming at least once fortnightly during one season (McDougall et al., 2022; Van Tulleken et al., 2018).

Materials

Each participant was asked a series of open-ended questions (See Supplement 2 for the Interview Schedule) aimed to cover participants experience in cold-water swimming.

Procedures

All essential documentation and demographic (age, gender, employment status, and annual income) were delivered via a Qualtrics link emailed to all the participants. To ensure the safety of all parties involved, online interviews using Transport Layer Security and Secure Real-Time Transport Protocol encryption software, Microsoft Teams was used. Interviews lasted between 20 and 45 minutes. Data was audio recorded and then transcribed verbatim into Microsoft Word using the Sound Recorder App and Microsoft Teams accordingly.

Data analysis

Interpretative Phenomenological Analysis (IPA) (Larkin et al., 2021) was used to obtain vivid, first-person accounts. This idiographic approach elicited detailed perspectives focused on the lived experiences (Larkin et al., 2021) and associated meanings that participants ascribed to blue therapy's influence on their personal wellness. The seven-phase IPA analysis was applied (Larkin et al., 2021). The first stage consisted of reading and re-

reading of the transcript including initial notes of free associations and semantic content. Emergent themes were developed in an iterative process throughout. The process was repeated for each subsequent interview. This allowed for the identification of common higher-level qualities across cases while also noting idiosyncratic examples. The analysis involved a double hermeneutic, with the researcher trying to interpret participants' interpretations of their lived experiences (Charlick et al., 2016). Codes were checked by a member of the research team (NMM) to guarantee ideographic integrity. Codes were clustered into three superordinate themes and associated subordinate themes. The COREQ guidelines by Tong and colleagues (2007) were followed when reporting this study (See Supplement 1). Ethical clearance was obtained through the University of West London Ethics Committee prior to data collection.

Results

The analysis identified two superordinate themes. The first theme *Benefits to Blue Therapy* described the experiences of using cold-water swimming to improve physical, mental and psychosocial well-being. Theme two *Therapeutic ritual* outlined how swimming enhanced introspection, connectedness to nature, and helped to boost confidence, physiological and physical resilience.

Benefits to Blue Therapy

Physical well-being

The participants in the study reported physical health improvements from engaging in Blue Therapy. To start, participants reported that cold-water swimming was a natural extension of physical exercise. One participant reported initiating swimming after being invited to take part in a triathlon: "*Well, if they can do it, why can't I?"* (Participant 1). For others it was a natural extension of current physical fitness regime *"... I'm a swimmer and I'm watching these guys swim, but I'm not in there myself. 'Why? Why am I not in there?... So…I looked at the website and joined"* (Participant 6). Most participants noticed improvements to their physical health, stating that they "*don't succumb to the germs that other people do*" (Participant 1) while other still thought it could just be a coincidence: "*I don't get colds very often...I don't know if that would necessarily be due to swimming outdoors because I feel like*

generally keeping fit you're building up resilience.. I don't know if that's just a coincidence." (Participant 6). One participant noted that cold water can bring pain relief:

> *"I've had a sore shoulder for about five months, it's a climbing injury... and if it's a bit tense,.. I go cold-water swimming; I can feel it is a bit of relief. It helps relax it... If my muscles are a bit tight... cold-water swimming can...make everything a bit more relaxed."* (Participant 4)

On the other hand, some participants reported swimming in cold water "*because everyone says it's good for your joints*" (Participant 3).

Mental well-being

All participants mentioned that cold-water swimming helped to induce relaxation and reduce rapid thoughts. Participants reported swimming helped to improve mood suggesting it generated mental well-being. For example, participants reported:

> *"I always find it relaxing...if I go there and I'm in a bad mood beforehand, somehow the water always clears it afterwards... the problems that you had before always seem smaller and kind of more in perspective. And I always feel more cheerful after swimming."* (Participant 5)

> *"...your brain can just sort of spin off and... you're not trying to be strategic... that frees up your brain. And if I was ever feeling a bit down or.there was a decision that was hard to make or stuff was getting on top of me, I knew that if I went swimming,..it dissipated the problem substantially..."* (Participant 6)

While other participants reported it was a method to manage stress "*if I'm stressed about something, it can help with feelings it takes you away from thinking about that..."* (Participant 4). More importantly participants described cold-water swimming as a tool to alter mental perspective and attitude suggesting its ability to regulate and redirect thinking about personal problems:

> *"...it sort of takes you out of yourself, but brings you back into yourself in a funny kind of way."* (Participant 2)

> *"...it's my leveller...all of that helps your mental health because you're not thinking about the input that we have from everyday society and what we hear and see."* (Participant 1)

Psychosocial benefits

Participants also noted that swimming enhanced social networks and emotional bonds suggesting some important psychosocial benefits. Participants noted that inspiration to swim came from social media networks: *"I followed someone...who was blogging on Instagram about swimming in the lakes in the winter... I was like, "Wow! That looks amazing! I should try that!"* (Participant 2) or simply viewing other people swimming *"I just kept saying to myself, this is crazy... I'm a swimmer and I'm watching these guys swim, but I'm not in there myself. 'Why? Why am I not in there?'* (Participant 6). The interpersonal experiences between swimmer to swimmer generated a non-judgemental atmosphere that supported sharing thoughts, feelings, and life experiences with others. This suggests it can improve social connectedness:

> *"...quite good fun on the social part, meeting with friends...doing the cold swimming, and then afterwards sharing coffee and drinks and warming up."* (Participant 7)

> *"...the other day there was a woman there who I've seen quite often. And she was like, 'Oh, were you gonna go outside of the buoys?' And I was like, 'Yeah'...So as we swam, she chatted the whole time and I was thinking 'Oh, I was just here for a nice little quiet swim, but she had stuff to get off her chest and I was like, 'Well, I can just listen. I don't have to reply'. So, you know, it helped her."* (Participant 1)

Within this space, cold-water swimmers reported a feeling of safety, equality, and acceptance, describing it as "*safe, friendly, and inclusive*" (Participant 1) regardless of their social or financial status:

> *"...we all come from very different walks of life. We all have extremely different careers, doesn't matter, you know, no one is judging anyone. No one is social climbing...there's like a Hollywood film director, a woman that like, high-profile works for the BBC News. There's a mega journalist, there's like, lawyers, judges. There's anyone and everyone, so it doesn't matter what you do, there's no like class."* (Participant 1)

The experience of joining other swimmers was reported to provide an overarching sense of belonging to a group which was defined by an uncommon and even *"slightly eccentric"* (Participant 5) practice of cold-water swimming. This created a deeper social bonds, camaraderie and differentiating them from mainstream society. Participants state:

> *"...that also I think has benefits as well, just feeling part of something and be connected to this little group of people through this kind of shared hobby that we have."* (Participant 2)

> *"...it's a great way for me to manage stress, both from the swimming aspect, but also from the social aspect. There's something about being together with people who are doing the same thing. You may not have very much in common, but... you are all there to experience the same thing. And there's always...a very friendly atmosphere which I think really helps you to forget some of the day to day problems..."* (Participant 5)

Therapeutic ritual

The lived experience of open cold-water swimming was perceived as a type of alternative therapy or a *Therapeutic ritual.* Sub-ordinate themes showcased the mechanisms of this ritual for well-being, namely *Solitude, introspection and connection to nature* demonstrated how the frequent ritualistic routine provided for introspection via various pathways (swimming alone and the routine) and enhanced connectedness to nature. Participants also experienced improved self-confidence derived from overcoming challenges of cold-water shock, embracing boldness in cold temperatures, and taking pride in this accomplishment showcasing the second sub-ordinate theme of *Confidence, Physical and Psychological Resilience.*

Solitude, introspection, and connection to nature

Blue Therapy was described to be ritualistic which emphasised the introspective nature of the activity. For example, there was a great emphasis on the importance of the pre-swim routine for reflecting inwards. Experiences of self-reflection suggested swimming can enhance positive emotions:

> *"I'd been there at, like, 6:00-6:30am. And that is just beautiful because... London is quiet and it's just beginning to wake up...I always have my swimsuit on when I leave the house...depending on the time of year, I might wear little neoprene boots and neoprene*

> *gloves. I always wear a swim hat... goggles and... ear buds... I'm never gonna dunk my face...there's always like a little routine..."* (Participant 1)
>
> *"I noticed when I was going twice a week... I found it very calming...I just found that experience of the shock of the cold took me out of that headspace a little bit. And maybe there's also something about just feeling a routine or a ritual that you're doing for yourself. It doesn't take very long, but it felt special in that way."* (Participant 2)

The emphasis on solitude was also important as another participant emphasised the difference between the outdoor blue space vs. indoor spaces:

> *"I feel like it's much more about being part of the natural environment and the community around it. And then the way that it feels to be in the water... especially when it's that cold... it's so crisp and fresh…I don't feel like that in a chlorinated pool."* (Participant 2)

In contrast to swimming in a group, some participants choose to swim in solitude. This also provided time for introspection *"It was just a really good way of me... to be alone in your head, not talk to anybody because it's not a team thing... it just gave me space..."* (Participant 6). The physical vastness of cold-water swimming provided a point to reflect inwards without distractions from socialising:

> *"...it's just an incredible privilege to not have to worry about...other people... being in the space of two public swimming pools on my own and not having to worry about crashing into anyone or... worry about your space... And... the minute you get back into a public swimming pool...you get more "allergic" to being in other people's vicinity... I mean without being xenophobic, it's not like that."* (Participant 3)

Swimming appeared to also enhance connectedness with nature. For example, participants described the experience as transcending the body and "*being engulfed by water... is almost like being in space… you're not touching the ground... You are suspended"* (Participant 1). This experience of being in water was a tool used to alter attitudes and perspectives. In addition it provided a deeper connectedness with oneself, the environment and the sense of self:

> "*I like the feeling of floating. I think the difference for me in being in water in nature...You really feel like it changes your perspective on the world, and you suddenly*

are at eye level with ducks... there's just something about it. I just feel much more connected to the natural world in that environment..." (Participant 2)

While other participants described being in the natural space a tool to gain mental clarity and relaxation:

"...when you get out into the middle of the lake and all you can see is trees around the bank, and particularly on a sunny day, you just feel you're in the middle of nature. And I think it really takes you out of your normal state of mind. It really resets the mind to be just in such a different environment than the normal day to day life." (Participant 5)

Confidence and Physical and Psychological Resilience

Participants reported that swimming in cold deep water allowed them to gain self-confidence in their ability to overcome obstacles and face fear. This provided a sense of achievement and improved self-confidence:

"...it's a...mental leap to very, very deep water,.. Really, it's a different experience when you're in a swimming pool,.. the pool's completely clear... You see the bottom. But when you can't see any of that,.. It's quite overwhelming... There's an instinctive...fear..." (Participant 6)

"...I think the whole post-swimming "high"... I think part of it is just a sense of achievement and part of it is actually endorphins and things like that... and feeling happy... I never regret going for a cold swim." (Participant 4)

"I went to a wedding in Ireland. And the day after the wedding...it was by the sea... everyone was gonna go for a swim in April….And so I did... I felt a bit of bravado and I really loved it. I was surprised how much I liked it." (Participant 3)

Those participants who engaged in long-term cold-water swimming reported it built up physical resilience and increased self-confidence to continue swimming. This point was emphasised during comparisons of long-term experience to those who were new to sea swimming:

"I've got better at being in cold water, definitely I can get in quicker...stay in longer... feeling like I can really notice a difference... I'm much better at getting in [cold water]

than other people. I go swimming with friends who don't swim in the winter and they're like, Oh, it's so cold! and I'm like, It's fine!" (Participant 4).

Some participants opted for regular swimsuits over wetsuits as each method demonstrating growing resilience to the cold water. This physical resilience was perceived as an avenue of personal accomplishment. This was demonstrated by participants repeating phrases describing the difference between a wet suit vs. a bathing suit within the interview *"And in a swimming costume, not in a wet suit. In a swimming costume"* (Participant 3). While another participant stated:

"...this definitely for me the sense of achievement of the challenge. It's like you would have said that five years ago, I would have no way... I'm from the South of France... No way I'll do cold water. Not enough to be 25 degrees. I was always in a wetsuit in the UK... but since I've changed, I haven't used the wetsuit pretty much since." (Participant 4)

While a few participants acknowledged that cold-water swimming could elicit painful sensations, the use of coping strategies to gradually adapt to the challenges provided a sense of accomplishment and heightened achievement. This indicates participants developed the ability to regulate their internal responses to the physiological reactions to cold water, becoming more physically and mentally prepared, resilient and resourceful. For example:

"...I also think there's something psychological or mental, like if you have your hands up and you're like, "Oh, it's cold, it's cold!", you're tensing. And if you're tensing, it's gonna be even harder for you to relax and accept the temperature of the water. So I put my hands in and I don't tense. It's like I always say, "How is this making me feel?" (Participant 1)

"...it's actually a bit painful on your extremities when it's really cold. But once you have the gloves, it's fine. But I can't remember the very first time that I would be like, "Oh, that was the first cold water experience!" if that makes sense, cause it was more gradual, just getting colder and colder." (Participant 2)

"...you're physically... freezing... at the beginning it is burning, it hurts, and then slowly it disappears." (Participant 7)

Lastly, some participant noted the discomfort and potential risks of cold-water overexposure, such as negative aftereffects. This self-awareness and ability to practice self-care by attentively exploring and respecting their body allowed them to maximise the benefits while mitigating adverse effects by avoiding overstaying in the cold:

> *"It can be painful in the winter... My circulation in my fingers and my toes is not particularly great....so if it's really cold...the fingers warm up, it can be very painful. You're trying to tie your shoe laces and you can't feel anything... sometimes it makes you question your decision."* (Participant 5)

> *"...the only thing is really make sure you don't go too far, too long because then you have the kind of afterdrop... when your body keeps cooling down and you start to shiver, you feel unwell and that's the...I'd say...very unpleasant. Obviously, it could be leading to injuries if it's really bad."* (Participant 7)

Discussion

The aim of this qualitative study was to identify the mechanisms of cold-water swimming as a form of Blue Therapy for health and mental well-being by exploring the first-hand experiences of adult participants in the UK. The findings suggest several physical, mental, and psychosocial benefits found in existing research. In terms of physical well-being, this included reporting fewer cold illnesses and reduction of physical pain (Huttunen et al., 2004; Massey et al., 2020; Massey et al., 2022; Mole & Mackeith, 2018). Regarding mental well-being this included cold-water swimming as a method to enhance mood, inspire mindfulness, and reduce stress (Burlingham et al., 2022; Dugué & Leppänen, 2000; Huttunen et al., 2004). With respect to psychosocial benefits, this study and in previous research identified that cold-water swimming inspires social support, bonding and a sense of community (Burlingham et al., 2022; McDougall et al., 2022; Sam, 2020). However, there were several novel themes that provide a deeper understanding of the connection between psychosocial processes with well-being and how cold-water swimming can activate a connectedness to nature that can be used for Health psychologists in their health promotion programs.

Cold-water swimming and eudaimonic well-being

To start, mechanisms that generated psychosocial benefits of cold-water swimming identified in this study mimic eudaimonic well-being outcomes namely human achievement. This included enhanced relationships with others, personal growth, self-acceptance, and environmental mastery (Ryff et al., 2021). For example, participants reported that sea swimming enhanced social networks, improved emotional bonds, and created a group identity that provided safety, equality, and acceptance which appeared to improve positive relationships with others (Ryff et al., 2021). Participants who engaged in solo swimming experienced the benefits of introspection which helped to enhance personal growth and realising their potential. Despite recognising their own physical limitations through cold-water swimming, participants learned to self-regulate which in turn appeared to provide self-acceptance of personal barriers. Lastly, the activity of cold-water swimming provided a sense of control and personal growth, as participants reported choosing which aspects of the activity were suitable to engage in (e.g., swimsuit, time of day of the swim, length of swimming, etc.).

These mechanisms provide further understanding of how cold-water swimming can work as a form of Blue Therapy for well-being that can be used for health promotion. For example, health promotion programs using Biopsychosocial Model can easily integrate these findings as sea swimming can be conceptualised as a tool that works to produce health through the interaction of biological (e.g., cold exposure), psychological (e.g., mindset, emotions), and social aspects of self (e.g., group activities) (Suls & Rothman, 2004). In addition, programs that use Self-Determination Theory framework of health promotion (Ryan & Deci, 2022) can outline how cold-water swimming can fulfil the needs for autonomy (sense of choice), competence (mastering a challenge), and relatedness (bonding with other swimmers).

Blue therapy as a form of ecotherapy

The biophilia hypothesis (Kellert & Wilson, 1995) states that humans have an innate connection with the natural world and this provides a sense of well-being. This human-nature connection can have therapeutic value and be used as a form of ecotherapy to enhance eco-wellness (Doherty, 2016; Hasbach, 2015). Cold water swimming appeared to generate a sense of embodied self which helped participants improve a sense of belonging within nature

and improve mental well-being. In addition, these findings also support evidence for psychological factors related to eco-wellness, as participants described how the experience of sea swimming enhanced awareness of self-identity and supported social cohesiveness (Reese et al., 2019). This indicates that cold water swimming or Blue Therapy can be a form of ecotherapy. For example, ecotherapy interventions have been found to decrease chronic widespread pain, decrease depression, and improve quality of life compared to controls (Han et al., 2016) and also shows some efficacy for breast cancer survivors in being able to regain a sense of meaning and life purpose (Phelps, 2015). Health psychologists may suggest exploring cold-water swimming clubs in the open sea or suggesting simply viewing water as recent research provides evidence of viewing water demonstrates physiological markers for relaxation vs. viewing the ground space (Coss et al., 2022).

Limitations and recommendations for future research

Despite providing valuable insights, this study has several limitations. First, technical difficulties prevented some participants from fully engaging in the interviews. Secondly, while all participants met the recruitment criteria of swimming at least fortnightly for a full season, some were not actively swimming at the time of the interviews. This impacted their recollections, making their perceptions and memories less vivid. It would be beneficial to capture swimming experiences during peak season when memories are current and richly detailed. Observing them in-action could provide more descriptive insights. Finally, the small sample of seven participants inhibits a broader generalisation of findings. Participants were also mostly middle-aged, female, and of moderate socioeconomic status, limiting generalisability across demographics. As an exploratory qualitative study, the research cannot empirically confirm physiological and neuro-biological mechanisms or quantify well-being changes.

To address these limitations, future research should utilise larger, more diverse samples and mixed methods incorporating biomarkers, psychometrics, and behavioural measures, recruiting participants across the socioeconomic spectrum. Comparisons between regular versus new swimmers could explain changes in well-being over time. Quantitative tools assessing eudaimonia well-being, community belonging, human-nature identity could enrich our understanding of mechanisms. Experimental studies distinguishing social, environmental, and cold exposure effects would also be insightful. Ultimately, while beyond the scope of this

study, there is limited research that implies that the positive effects of cold-water swimming might last from a couple of hours to several months and even years (Knechtle et al., 2020; Van Tulleken et al., 2018). Longitudinal interventions with control groups are needed to provide substantial evidence of short and long-term well-being improvements and yield a clearer understanding of the optimal frequency of Blue Therapy for health and well-being.

Conclusion

This qualitative study suggests cold-water swimming can be an effective form of Blue Therapy, offering physical, mental, and psychosocial benefits. Novel findings reveal it enhances eudaimonic well-being processes such as enhanced relationships, personal growth, self-acceptance, and environmental mastery. The evidence supports integrating cold-water swimming as a form of Blue therapy and ecotherapy into health psychologists' promotion programs positioning it as a promising alternative therapy.

Ethics approval

The authors declare that they have obtained ethics approval from an appropriately constituted ethics committee/institutional review board where the research entailed animal or human participation. School of Psychology Ethics committee at University of West London

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRediT authorship contribution statement

Elena Gabitova: Conceptualization, Methodology, Formal analysis, Investigation, Writing – original draft, Writing – review & editing, Visualization, Project administration.

Nicole M Miller: Conceptualization, Writing – review & editing, Supervision.

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Supplement 1: Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist for adult open cold-water swimmers in the United Kingdom: A qualitative analysis.

No. Item	Guide questions/description	Reported on section
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Methods - Data analysis. Additional description is below: EG conducted recruitment, data collection and analysis. EG uses she/her pronouns and has MS training in psychology methods including Interpretative Phenomenological Analysis. EG had an existing relationship with Participant 1 who agreed to participate in the study. EG had no prior connection to the rest of the participants, who were all recruited directly via email. EG had no practical experience in open cold-water swimming prior to data collection allowing an open perspective. Also, while the literature review initially focused the researcher on physiological risks, discussion with an experienced cold-water swimmer (Participant 1) highlighted additional facets and balanced the researcher's perspective.
2. Credentials	What were the researcher's credentials? E.g., PhD, MD	
3. Occupation	What was their occupation at the time of the study?	
4. Gender	Was the researcher male or female?	
5. Experience and training	What experience or training did the researcher have?	
No. Item	**Guide questions/description**	**Reported on section**
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	Methods - Data analysis. (See above description)

7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g., personal goals, reasons for doing the research	
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g., Bias, assumptions, reasons and interests in the research topic	

No. Item	**Guide questions/description**	**Reported on section**
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g., grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Methods - Data analysis
Participant selection		
10. Sampling	How were participants selected? e.g., purposive, convenience, consecutive, snowball	Methods - Participants and procedures, Data analysis
11. Method of approach	How were participants approached? e.g., face-to-face, telephone, mail, email	
12. Sample size	How many participants were in the study?	
13. Non-participation	How many people refused to participate or dropped out? Reasons?	In total, snowball sampling yielded 14 potential participants. However, seven of them had to be excluded for the following reasons: 2 people were residing in Switzerland, 1 in Latvia, 1

		person was not familiar with using Microsoft Teams software and refused help with setting it up, and 3 people could not agree on the interview schedule.
Setting		
14. Setting of data collection	Where was the data collected? e.g., home, clinic, workplace	Methods - Participants and procedures
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	
16. Description of sample	What are the important characteristics of the sample? e.g., demographic data, date	
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Methods - Participants and procedures (See online Supplement 1 for the interview schedule)
18. Repeat interviews	Were repeat inter views carried out? If yes, how many?	Not applicable
No. Item	**Guide questions/description**	**Reported on section**
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Methods - Participants and procedures
20. Field notes	Were field notes made during and/or after the interview or focus group?	Methods - Data analysis
21. Duration	What was the duration of the interviews or focus group?	Methods - Participants and procedures
22. Data saturation	Was data saturation discussed?	Methods - Participants and procedures
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Not applicable

Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	A total of 271 segments were coded into 78 codes.
25. Description of the coding tree	Did authors provide a description of the coding tree?	Not applicable
26. Derivation of themes	Were themes identified in advance or derived from the data?	Methods - Data analysis
27. Software	What software, if applicable, was used to manage the data?	Methods - Participants and procedures
28. Participant checking	Did participants provide feedback on the findings?	Not applicable
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g., participant number	Results
30. Data and findings consistent	Was there consistency between the data presented and the findings?	
No. Item	**Guide questions/description**	**Reported on section**
31. Clarity of major themes	Were major themes clearly presented in the findings?	Results
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	

Developed from: Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International journal for quality in health care*, *19*(6), 349-357.

Supplement 2: Interview schedule for adult open cold-water swimmers in the United Kingdom: A qualitative analysis.

Questions:
1) Can you start by telling me about how you became interested in cold-water swimming?
2) Can you describe a typical day of cold-water swimming for you?
3) Have you noticed any changes in your health and/or mental well-being since you started cold-water swimming?
4) What is it so special about open cold-water swimming?
4a) How does water make you feel?
5) Have you noticed any cons to open cold-water swimming?