

# Cold Water Immersion Activities: The Effect on Mental Health, Self-Efficacy, Resilience & Mental Toughness

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## Introduction

Cold water immersion activities (CWI) have increased in the recent years. A 29% increase occurred in Ireland between 2020 & 2022 (Murray, 2022). Studies show, an aquatic environment has a positive influence on wellbeing (Foley, 2015).

Over 40% of individuals in Ireland declared a mental health issue (Conneely, 2023). Stress affects a vast number of people every day. Ireland is one of the highest in Europe, where one in six have reported a mental health issue like stress or anxiety (Mental Health, Ireland, n.d.).

The benefits of CWI has also been highlighted in sports recovery, as a physical recovery treatment but more recently as mental recovery and a calming technique (Crowther, et al 2017). According to (Zhou et al, 2021) factors such self-efficacy is also linked to positive well-being. CWI has a positive influence on self- efficacy, seen in studies such as Hollander & Acevedo (2000).

Resilience can also counteract mental health issues and research has shown increased mental resilience from CWI (Denton & Aranda, 2020). Mental toughness is another factor of one's psychological well-being and CWI has been seen in Hollander & Acevedo (2000) to be a major theme amount sea swimmers.

The aim of this study is to measure the effects of Cold Water immersion on Stress, Anxiety, Self-efficacy, resilience and Mental Toughness.

## Hypotheses

1. The DASS-21 stress scores will be lower for people who engage in CWI compared to non-CWI participants, while controlling for stressful work and stressful daily life.
2. The DASS-21 anxiety scores will be lower for people who engage in CWI compared to non- CWI participants, while controlling for stressful work and stressful daily life.
3. Self-Efficacy scores will be significantly higher for people that engage in regular CWI compared to people who engage in occasional CWI.
4. Resilience scores will be significantly higher for people that engage in regular CWI compared to people who engage in occasional CWI.
5. Mental Toughness scores will be significantly higher for people that engage in regular CWI compared to people who engage in occasional CWI

Q: "What benefits do you feel you gain from cold water immersion activities?"



## Methodology

- o Mixed methods, a quantitative and qualitative design.
- o Data analysis, through Microsoft forms, SPSS & NVivo.

## Participants

- o 135 adults from the public, worldwide
- o 45 Male and 90 female. Mean age 44
- o Snowball and targeted sampling through social media.

## Procedure

- o An anonymous survey was shared online via link.
- o Once consent was provided, participants completed demographic questions, four parametric tests and one single open-ended question.

## Materials

- o DASS-21 (Stress & Anxiety subscales) (Lovibond & Lovibond, 1995)
- o General Self-Efficacy Scale (Schwarzer & Jerusalem, 1992).
- o Brief Resilience Scale (Smith et al, 2008)
- o Mental Toughness Questionnaire-10 (Papageorgiou et al,2018).

## References

A To Z - Mental Health Ireland. (n.d.) <https://www.mentalhealthireland.ie/a-to-z/>

Algafly, A. A., & George, K. P. (2007). The effect of cryotherapy on nerve conduction velocity, pain threshold and pain tolerance. *British journal of sports medicine*, 41(6), 365-369.

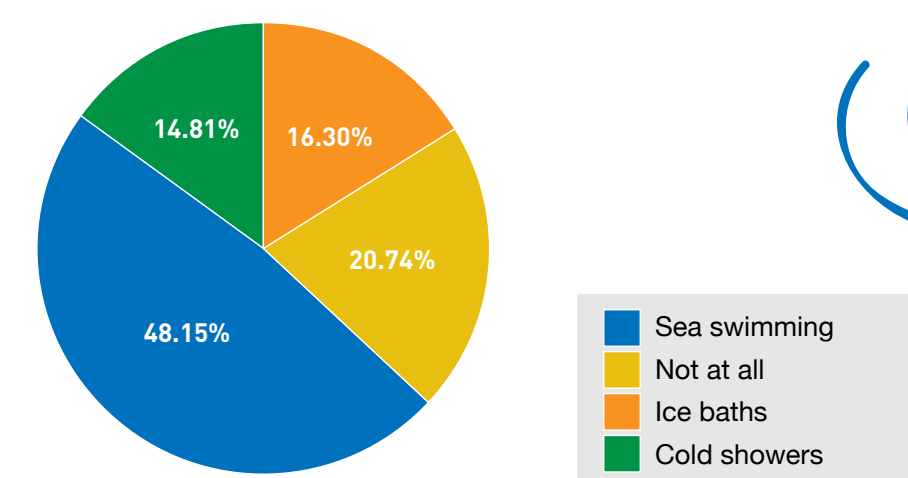
Burlingham, A., Denton, H., Massey, H., Vides, N., & Harper, C. M. (2022). Sea swimming as a novel intervention for depression and anxiety-A feasibility study exploring engagement and acceptability. *Mental Health and Physical Activity*, 23, 100472.

Conneely, A. (2023, March 23). Ireland lacks key mental health services, report finds. RTE.ie. <https://www.rte.ie/news/2023/0323/1365790-mental-health/>

Crowther, F., Sealey, R., Crowe, M., Edwards, A., & Halson, S. (2017). Team sport athletes' perceptions and use of recovery strategies: a mixed-methods survey study. *BMC Sports science, medicine and rehabilitation*, 9(1), 1-10.

## Results

### CWI Groups



### Frequency of engagement in CWI

How Often	Frequency	Valid%
2-3 times per week	63	58.9
Once a week	21	19.6
Once every few weeks	9	8.4
Occasionally	14	13.1
Total	107	100
Missing	28	
<b>Total</b>	<b>135</b>	

### Cold Water Immersion Group

Stress (M = 11.6)  
Anxiety (M = 5.30)

### Non- Cold Water Immersion Group

Stress (M = 14.5)  
Anxiety (M = 5.85)

### Regular Cold Water Immersion Group

Self- Efficacy (M = 32.30)  
Resilience (M 3.57)  
Mental Toughness (M 3.56)

### Occasional Cold Water Immersion Group

Self- Efficacy (M = 28.60)  
Resilience (M = 3.21)  
Mental Toughness (M = 3.04)

## Results:

**H1:** An ANCOVA found Stress was significantly higher for the non CWI group compared to the CWI group when controlling for stressful lives and stressful work. ( $F(1,124) = 4.5, p = .034, \text{effect size} = .04$ ).

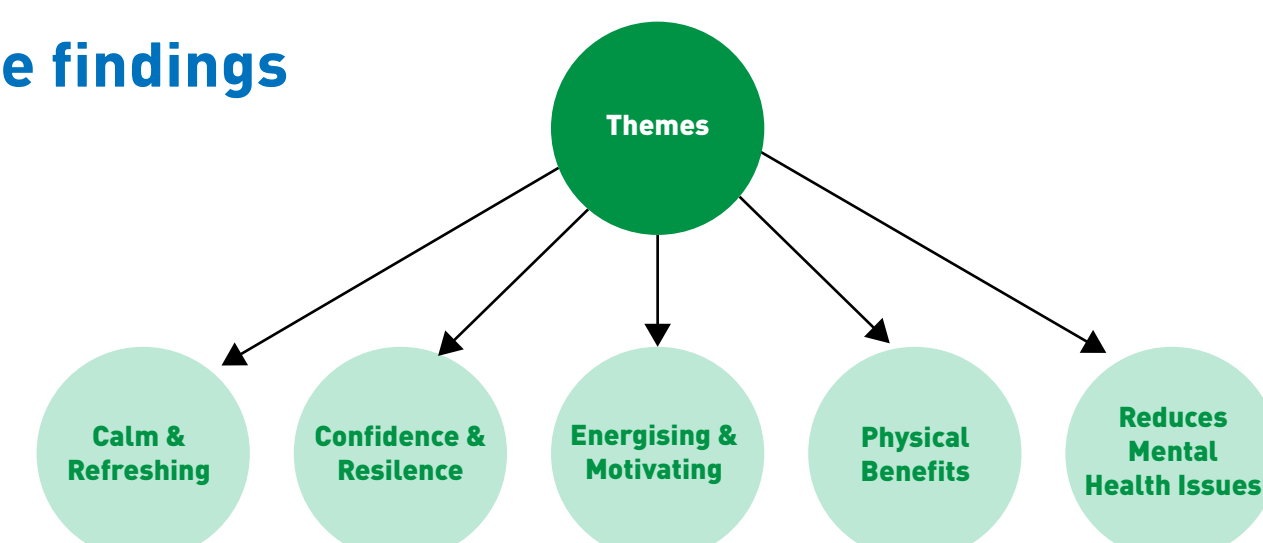
**H2:** An ANCOVA found Anxiety was not significantly higher for the non CWI group compared to the CWI group when controlling for stressful lives and stressful work. ( $F(1,124) = .57, p = .449, \text{effect size} = .005$ ).

**H3:** A t- test found a significant difference in self- efficacy between regular and occasional CWI ( $t(104) = 3.090, p = .003$ ).

**H4:** A t-test found a non-significant difference in resilience between regular and occasional CWI.

**H5:** A t-test found a significant difference in mental toughness between regular and occasional CWI ( $t(103) = 3.174, p = .002$ ).

## Qualitative findings



## Discussion & Conclusion

There are various mental health benefits of CWI, demonstrated in this study together with previous literature (Burlingham et al, 2022; Denton & Aranda, 2020).

The quantitative results indicated, CWI has a positive influence on Stress, self-efficacy and mental toughness. The qualitative findings supported these positive influences while also demonstrating reduced anxiety, physical benefits, increased energy, calming effects and resilience.

This study can contribute to future research and potentially ignite interest in further investigation into the mental health benefits of CWI.

"Invigorating"  
"Sense of peace"  
"feeling uplifted"  
"Clears my mind"

