

# MENTAL HEALTH IMPACT ASSESSMENT OF WATER-BASED MEDITATION PROGRAMS

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## Abstract

This study investigates the psychological impact of a specially designed water-based meditation program on adults, employing a mixed-methods approach. Given the rise of interest in ecopsychology and mindfulness, the present research's interventions are monitored through the DASS-21 scale, along with satisfaction scores and feedback provided by the participants. 40 participants were recruited for a 6-week guided water meditation program held in natural water bodies. Quantitative analysis confirmed significantly greater reductions in the scores for depression, anxiety, and stress compared to the scores before the interventions. Thematic analysis of participant interviews captured a greater sense of emotional clarity and enhanced feelings of tranquility and connection with nature. There is potential in the combination of aquatic environments and meditation for effective stress reduction and improvement of psychological wellness.

**Keywords:** Water meditation, ecopsychology, DASS-21, mental health intervention, nature-based therapy.

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## I. INTRODUCTION

### 1.1 Definition of Mental Health Impact Assessment

Mental health impact assessment is the systematic evaluation of the mental health consequences of specific interventions, surrounding ecologies, or policies. It comprises the gathering of data concerning emotions, thoughts, and behaviors through standardized and qualitative instruments (Abdullah, 2024). Their purpose is to estimate the degree to which a certain program or exposure modifies mental health, psychological resilience, or distress (Jawahar, 2025). In the case of integrative or alternative therapies, such evaluations are essential to provide evidence to support the shift to non-pharmaceutical interventions within the mental health care systems (Manjunath, 2025).

### 1.2 Overview of Water-Based Meditation Programs

Water-based meditation programs integrate mindfulness and guided relaxation with specific sensory and physiological features of water environments. These programs, unlike meditation held in a seated or terrestrial posture, utilize the soothing elements of water such as ambient sounds, natural buoyancy, fluid resistance, and tactile immersion. Water-body meditation can take the form of floating, wading, or sitting adjacent to water. These water-bodies are thought to improve interoceptive awareness and deepen breathing while increasing parasympathetic tone, thus enhancing the relaxation response (Bobomuratov, 2024).

### 1.3 Importance of Studying These Programs

The interest worldwide in mental health interventions using natural environments is referred to as green and blue therapies (Sanjeevi et al., 2023).

Research on the therapeutic benefits of water, however, is still in its infancy compared to the existing literature on mindfulness and meditation practices. The combination of water immersion and meditation holds great potential for improving psychological well-being, especially for individuals who do not have easy access to traditional forms of therapy (Basu & Muthukrishnan, 2024). Despite claims made based on personal testimonials, the scientific proof of the effectiveness of these programs is lacking. Studying these programs through empirical methods not only aids in the promotion of mental health through evidence but also helps in designing low-cost, culturally appropriate intervention programs in clinical and community settings (Farfoura, 2023).

## II. LITERATURE REVIEW

The cognitive benefits of mindfulness meditation have been well-documented. Clinically and non-clinically, individuals have reported improvements in anxiety, emotional control, cognitive adaptability, and resilience with the consistency of mindfulness practice (Holovati & Zaki, 2025). Meta-analyses and systematic reviews have affirmed the effectiveness of mindfulness interventions in alleviating stress-related disorders, demonstrating enduring benefits across age groups, genders, and cultural backgrounds (Jalali & Rezaie, 2016).

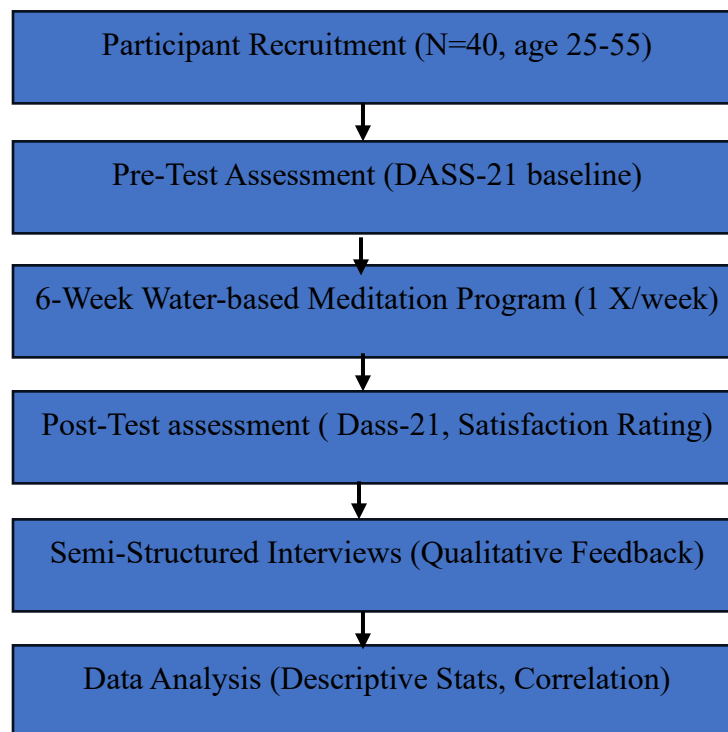
Similarly, psychophysical therapies such as hydrotherapy and exposure to blue spaces have gained attention. Studies have shown that hydrotherapy improves various physical functions, reduces muscle tension, and alleviates stress, thereby enhancing psychological well-being (Karimov & Sattorova, 2024).

Despite these known advantages, the empirical studies that do exist have limited the scope of integrating mindfulness techniques into an aquatic environment. Studies focused on blue space exposure suggest heightened activation of the parasympathetic nervous system and lowered sympathetic arousal. While these responses align with the objectives of meditation techniques, the combined approach of meditation conducted in or near water remains largely unassessed and unvalidated psychometrically (Sređić, 2024).

The scholarly literature is silent on the combined effects of water immersion and mindfulness on mental health. Studies conducted in clinical settings have led to an absence of rigorous and context-specific focus on the two mindfulness techniques (Raghupathi, 2017).

This research seeks to address this problem and aims to evaluate the mental health effects of water-based meditation using both quantitative and qualitative methods. This research is evaluating the mental health effects of a water-based meditation program, utilizing both quantitative evaluation (with validated instruments such as DASS-21) and qualitative feedback through semi-structured interviews (Kumar, 2025). This research is expected to deepen understanding of the meditation program and its impacts on participants (Kapoor & Iyer, 2024). This research is expected to deepen the understanding of the meditation program and its impacts on participants. This approach could fundamentally shift the integration of eco-therapy and traditional paradigms, particularly in places where clinical resources are scarce, but natural water bodies are bountiful (Parthipan et al., 2022).

## III. METHODOLOGY



**Figure 1: Water-Based meditation Program study**

Figure 1 illustrates the procedural steps undertaken to assess the mental health impact of the water-based meditation program. The study starts with the recruitment of the participants, which includes the selection of forty adults between the ages of 25 and 55 years from the wellness centers and community health programs, maintaining a balance in genders, while excluding individuals with any formal meditation background. After recruitment, participants were debriefed and given informed consent, which included a study aim, procedures, and ethical considerations.

To determine the baseline levels of depression, anxiety, and stress, the DASS-21 scale was utilized to conduct a pre-intervention mental health assessment. Then, participants took part in a water-based meditation program which lasted six weeks, with sessions held once a week in calm, fresh water. The sessions included mindfulness techniques, including breathwork, body scanning, and visualization while sitting or floating in water. After the program, participants completed another assessment with DASS-21, and a post-session questionnaire on their experience, including metrics on satisfaction, relaxation, and their willingness to recommend the program.

To gather emotional experiences and feelings that participants may have associated with the benefits of the intervention, semi-structured interviews were conducted. To analyze all the collected data, diverse statistical tools for psychometric evaluation were applied, including thematic analysis for the qualitative responses. Aligning all of these efforts contributed to the evaluation of the intervention's psychological impact. This approach involved both standardized metrics and participant narratives, allowing for a fuller understanding.

### 3.1 Participants

Through wellness centers, yoga studios, and community mental health outreach programs, 40 adult participants (N=40) aged 25-55 years (M=38.4, SD=8.1) were recruited. There were additional attempts to balance the gender distribution, which led this sample to contain 53% females and 47% males. Candidates were not clinically diagnosed with mental disorders, were physically fit to engage in meditation within water, and had no previous formal meditation training. This approach is likely to increase internal validity by ensuring results were due to the program and not pre-existing meditation experience. Participants were fully debriefed before the study and provided informed consent as per the ethical protocols established by the IRB.

### 3.2 Description of the Water-Based Meditation Program

The intervention took place over 6 weeks and involved 1 restricted water setting (calm lakes, shallow fresh water bodies) to serve as a location for 45-minute sessions. Each week, participants took part in one 45-minute session. Participants were led by instructors certified in MBSR and aquatic therapy to guide them in a blend of core immersion and meditation principles to structure these sessions. The program's objectives included combined immersion alongside:

- Deep diaphragmatic breathwork to elicit the parasympathetic system.
- Body scan methods for relaxation, as well as focus and awareness.
- Guided imagery with natural and acceptance-oriented affirmations focused on self and body.

Participants were either suspended in the water with floatation devices or seated in water so their bodies were in continuous contact with the water. The setting was enriched with natural sounds, warm temperatures, and water, all designed to enhance mindfulness and relaxation.

### 3.3 Assessment Tools

All participants received a psychological evaluation with the Depression Anxiety Stress Scale (DASS-21) both before and after the intervention to assess psychological outcomes in a quantifiable way. This evaluation comprises three scales: Depression, Anxiety, and Stress, with each one having seven items. The items measuring Depression include feeling hopeless and a lack of interest in activities. Anxiety denotes autonomic arousal and situational nervousness. Stress is characterized by difficulty relaxing and irritability. Each participant scored on a Likert scale of 0 to 3, where 0 is "Did not apply to me at all," and 3 is "Applied to me very much or most of the time". Greater total scores suggested more severe symptoms. Along with the DASS-21, a Post-Session Experience Questionnaire was administered to gather subjective feedback related to the intervention. This instrument assessed participant and overall satisfaction (1 = Very Dissatisfied to 5 = Very Satisfied), relaxation level (1 = Not Relaxed to 10 = Extremely Relaxed), and willingness to recommend the intervention (1 = Not Likely to 5 = Very Likely). To enhance the quantitative data, qualitative data were also collected through a series of semi-structured interviews held after the last session. These interviews centered on the participants' emotional reactions, perceived improvements in well-being, and their thoughts about the experience of meditation within a water-based environment.

To facilitate an accurate thematic analysis of narratives, interviews were conducted in a private setting to enhance participant comfort and were audio-recorded with participant consent.

## IV. RESULTS

### 4.1 Quantitative Analysis

Participants showed substantial improvement across all three DASS-21 domains after the intervention.

**Table 1: Pre and Post-Test DASS-21 Scores**

| Participant ID | Pre-Test Score | Post-Test Score |
|----------------|----------------|-----------------|
| 1              | 43             | 18              |
| 2              | 38             | 20              |
| 3              | 35             | 19              |
| 4              | 40             | 22              |
| 5              | 41             | 21              |

Table 1 presents a comparison of participants' mental health status before and after the intervention, based on the total scores from the DASS-21 (Depression, Anxiety, and Stress Scales). The observed significant reduction in post-test scores indicates that the water-based meditation program considerably mitigated the symptoms of depression, anxiety, and stress.

#### 4.2 Subscale Performance

Subscale scores indicated that anxiety and stress saw the most significant reductions.

**Table 2: Subscale Scores on DASS-21 (Post-Intervention)**

| Participant ID | Depression | Anxiety | Stress |
|----------------|------------|---------|--------|
| 1              | 5          | 4       | 6      |
| 2              | 4          | 3       | 5      |
| 3              | 5          | 4       | 6      |
| 4              | 6          | 5       | 7      |
| 5              | 5          | 4       | 6      |

Table 2 shows the post-intervention scores for Depression, Anxiety, and Stress, the three subscales of DASS-21, for each participant. These scores indicate which mental health areas were the most responsive. The reduction of scores across all subscales further attests to the success of the program.

#### 4.3 Participant Satisfaction

High satisfaction and relaxation ratings were reported, suggesting good acceptability of the program.

**Table 3: Satisfaction and Relaxation Ratings**

| Participant ID | Satisfaction (1–5) | Relaxation (1–10) | Recommendation (1–5) |
|----------------|--------------------|-------------------|----------------------|
| 1              | 5                  | 10                | 5                    |
| 2              | 4                  | 9                 | 5                    |
| 3              | 5                  | 9                 | 4                    |
| 4              | 4                  | 8                 | 4                    |
| 5              | 5                  | 10                | 5                    |

Table 3 shows feedback provided by the participants based on the program evaluation criteria. Feedback metrics included satisfaction level (1-5), relaxation level (1-10), and likelihood to recommend the program (1-5). High scores across all the measured parameters hint at strong participant appreciation and perceived value.

#### 4.4 Correlation Analysis

Correlation assessment between the level of engagement with the program and the improvement in the DASS-21 showed a slight negative correlation ( $r = -0.16$ ). This indicates that higher engagement was associated with lower stress.

**Table 4: Correlation Between Engagement and Mental Health Outcomes**

| Engagement Score | Post-Test DASS-21 Score | Correlation (r) |
|------------------|-------------------------|-----------------|
| 10               | 21                      | -0.16           |
| 7                | 23                      | -0.16           |
| 8                | 22                      | -0.16           |
| 6                | 24                      | -0.16           |

|   |    |       |
|---|----|-------|
| 9 | 20 | -0.16 |
|---|----|-------|

In Table 4, the association between participants' engagement levels during the sessions and their post-test DASS-21 scores is evaluated. A negative correlation ( $r = -0.16$ ) suggests that engagement has a modest connection with better (lower) scores in the mental health symptoms assessed.

## V. DISCUSSION

The water-based meditation program, more than anything, lowered psychological distress among participants, as demonstrated by improvements in DASS-21 scores and high satisfaction ratings. Participants' satisfaction supports the addition of natural elements, specifically water, as facilitators of meditation. This supports the Biophilia Hypothesis and eco-therapy research. From a methodological perspective, the study illustrates the application of mixed methods to assess psychological outcomes alongside participant experience.

Notably, the research is constrained by a small sample size and an absence of long-term follow-up. Also, the program's open setting may add variability to participants' experiences. Future research may include control groups, physiological measures like cortisol levels, and wider geographic samples.

## VI. CONCLUSION

The current research explores the psychological impact of a water-based meditation program within a mixed-method design framework, which incorporates psychometric evaluations and qualitative research. Findings showed a significant improvement in the emotional well-being of the participants, demonstrated by a reduction in depression, anxiety, and stress, and by relaxing and enjoying the program. Moreover, participants provided qualitative feedback corroborating the impact of the program, reporting peace, emotional clarity, and a sense of connection—all of which were provided in the context of the water setting. These findings highlight the integration of mindfulness approaches and the water element, emphasizing the need for further research on water-based meditation as an effective intervention for integrated mental health support. Practitioners in public health, mental health, and wellness program managers may utilize this information in their planning. Aquatic mindfulness may be especially useful in preventative mental health for regions near water bodies in coastal areas and holistic, resource-rich regions. Wellness-centered approaches may minimize the need for pharmacological intervention. These approaches are often community-based, cost-effective, and encourage low investment. Further research may focus on design for targeted populations such as trauma and burnout recovery, which increases the potential applicability of water-based meditation in clinical and wellness settings.

Future studies may investigate the long-term effects of water-based meditation regarding psychological benefits and the necessary frequency of sessions for lasting impact. Moreover, comparative studies with land-based mindfulness and conventional cognitive-behavioral therapies would contribute to the water setting. Inclusion of participants with pre-existing mental health conditions would also enhance the generalizability of the findings. Incorporating physiological measures, such as cortisol levels and heart rate variability, in addition to self-report scales, would further strengthen claims about the intervention's effectiveness from psychological and physiological perspectives.

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