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Study title: *Effects of darkness retreat*

Study protocol and statistical analysis plan

NCT number: *Pending*

1. Study protocol

Background

The Dark Retreat (DR) experience is a practice originating in the tantric movement of Tibetan Buddhism, in which a person stays in total darkness for a few days - eating, sleeping, meditating without any contact with natural or artificial light (Lowenthal, 2003). Historically reserved for Tibetan monks, it is now gaining popularity among people seeking spiritual experiences. According to proponents, the retreat is meant to allow the body and mind to relax, to take a closer look at oneself, and consequently to break strenuous cognitive or emotional habits, as opposed to under conditions opposite to the overstimulation of the outside world.

The Youtube channel features posted interviews with Dark Retreat participants, in which they talk about their retreat experience (https://www.youtube.com/@skycaveretreats). In support of this study, a content analysis of the recordings was conducted to identify co-occurring themes in the interviews. Findings from the above analysis indicate that participants experienced a change in their perceptions of themselves, their relationships with others, their thinking, or their emotional experiences. Each participant described the dark retreat experience as deeply spiritual, life-transforming and positively impacting their mental health. A meta-analysis conducted by Karki et al. (2024) based on an international sample from eight countries indicated that religiosity and, to a lesser extent, spirituality are associated with mental health. It remains an open question whether the experience of darkness promotes the development of spirituality or otherwise affects mental health?

To our knowledge, the phenomenon of dark retreat has not previously been of interest to psychologists. Testimonies of participants indicate that perhaps deprivation under controlled conditions can be associated with positive changes in psychological functioning. However, there are no studies defining what this change could be or what is also a possible explanation for its process. The following study will be the first attempt to observe, in psychological terms, the experiences of dark retreat practitioners and, if we can observe differences before and after the experience, to answer the question of whether these changes persist over time. Analysis of the DR testimony recordings allowed us to pick out the following variables relating to various manifestations of mental health - anxiety, mindfulness, meaning in life, growth, emotion regulation and concentration. Due to the lack of available literature data relating to dark retreats, the following review of the current state of knowledge relates

to mindfulness research. This selection was dictated by the thematic overlap between DR's statements and the principles of Mindfulness (Kabat-Zinn, 2015)

Experiencing excessive anxiety and often accompanying worry are among the common mental health problems (Haller et al., 2014; Momin et al., 2023) although of lesser severity they can occur in the healthy population (Clancy et al., 2020; Dupuy et al., 2001). For people with anxiety disorders, the recommended treatment of choice is psychotherapy, which is assessed to be highly effective and persistent over time (Curtiss et al, 2021; Johnco et al, 2024; Kowalski et al, 2024). Individuals looking to reduce their anxiety, excessive feelings of stress or worry can also benefit from other alternative, non-pharmaceutical methods with proven efficacy, such as practicing yoga or mindfulness methods (Crane et al., 2021). For example, practicing yoga has been proven to reduce perceived levels of stress and anxiety (Erdoğan Yüce and Muz, 2020). Preliminary findings also indicate that yoga may be effective as either an adjunct to therapy or as a stand-alone treatment for patients with anxiety disorders (Nemeroff et al., 2024; O'Shea et al., 2023). Mindfulness training, on the other hand, unlike yoga, which is based on body-directed mindfulness practice, focuses on learning to direct one's attention to the present moment in such a way as to not judge but accept one's own emotional or cognitive experiences (Kabat-Zinn, 2015). Thus, mindfulness practice can lead to a change in the perception of internal experiences, and by extension also change the way we think and the emotions that arise as a result of thoughts, for example, anxiety (de Abreu Costa et al., 2018). A meta-analysis by Shumer et al. (2018) also indicated that practicing mindfulness may be associated with reduced negative reactivity in response to external and internal experiences. Mindfulness can either be treated as a trait, referring to an innate ability to be mindful, or developed as mindfulness practice continues (Bamber and Schneider, 2016). Mindfulness as a trait is associated with greater self-confidence, mental health, better emotion regulation, and correlates negatively with perceived life stress, anxiety and depression (Mesmer-Magnus et al., 2017). Hence, need to create and evaluate training that promotes the development and enhancement of this trait is not surprising (Bayot et al., 2024, Bohlmeijer et al., 2010, Teasdale et al., 2016). From the accounts of dark retreat practitioners, it appears that retreat and sensory deprivation allowed them to observe their own thoughts related to past or present functioning and accept them. Therefore, we would like to verify whether the experience of darkness promotes the development of mindfulness and a change in severity of anxiety or worry.

Practicing mindfulness can also promote positive changes in relation to mental health (Lindsay and Creswell, 2015). For example, a meta-analysis by Chu and Mak (2019) indicated that mindfulness-based interventions can increase a sense of

meaning in life, although the effect was found to be moderate. A sense of meaning, defined as a state of self-knowledge about one's own meaning, purpose or significance gained in life (Kossakowska et al., 2013), is associated with better physical health and an overall sense of physical and psychological well-being, as well as lower anxiety (Chu and Mak, 2019). Preliminary findings also indicate that a consequence of mindfulness training may also be growth, although these studies refer only to post-traumatic growth (Post-traumatic growth, PTG; Shyiko et al., 2017), understood as a process of change after a traumatic experience in the following areas: appreciation of life, interpersonal relationships, recognition of personal strengths, openness to taking a different life and spiritual path (Tedeschi and Blevins, 2015). Although current concepts refer to growth after very difficult and stressful events, opinions are beginning to emerge in the scientific literature that not only the worst but also the best experiences can lead to lasting beneficial changes, known as post-traumatic growth (Mangelsdorf et al., 2018). It is believed that mindfulness, may be associated with mental health benefits, as it allows for the regulation of affective states and meta-awareness of one's experiences, which may consequently lead to a different interpretation of events or better coping with difficult situations (Lindsay and Creswell, 2016). Given the numerous testimonies of reevaluating the lives of darkness retreat participants, we would like therefore to examine whether growth and changes in meaning in life can be observed among darkness retreat participants.

Some studies also suggest that mindfulness training can improve cognitive function, both in young adults and children (Bauer et al., 2020; Kittler et al., 2022), although the findings are inconclusive. For example, a meta-analysis by Gill et al. (2020) found no effects on attention and executive functioning as a result of mindfulness practice, while other studies have indicated training effects on inhibition and task shifting (Williams et al., 2024). Despite the outlined inconsistencies, in the proposed study we have also decided to test whether the experience of darkness would be associated with changes in cognitive functioning. It should be emphasized, however, that if persistent changes could be observed, there is no explanatory model based on the current state of knowledge regarding the effects of mindfulness on cognitive function.

When analyzing the potential of a given experience, training or therapy, it is also important to control for variables on the part of the participant or patient that may increase the likelihood of change. In the context of psychotherapy, it has been noted that readiness to change, understood as the degree to which a person is willing to accept, adopt and enforce a specific plan to change the status quo (Rafferty et al., 2012), has been shown to be related to therapy outcomes (Krebs et al., 2018). Other factors that may also be associated with the final outcomes of therapeutic

interventions include: expectations of therapy (Kuusisto et al., 2011), credibility of psychotherapy (Kumpasoğlu et al., 2024) and the need to pay for the service, although opinions are divided regarding the relationship between payment and the effectiveness of psychotherapy (Herron and Sitkowski, 1986). In our study, we also plan to control for the above factors on the part of darkness retreat participants, in order to assess their impact on the outcome of the experience.

Feasibility and Pilot Study Goals

1. Is the protocol feasible, implementable, and safe under real-world conditions when working with a non-clinical population?

2. Does a darkness retreat experience result in reduced levels of anxiety, negative affect, worry, and rumination, along with greater positive changes in psychological functioning—especially in attention, mindfulness, cognitive flexibility, emotion regulation, and a sense of meaning in life?

3. If positive changes in psychological functioning are observed, are these changes less pronounced in participants undergoing high vs low monitoring conditions, i.e. three vs one psychological consultations per day?

4. If positive changes in psychological functioning are observed, will they be lasting—that is, will they be maintained for six months after the experience ends?

5. Do individual traits, such as readiness for change and expectations regarding the experience, modify the immediate effects of participating in a darkness retreat?

6. Does client satisfaction with intervention moderate the effects of participating in a darkness retreat?

Hypotheses

1. The primary goal of our study is to verify if the designed protocol is practical, implementable, and safe in real-world conditions when working with a non-clinical population. Our basic hypothesis is that these protocols will fulfill this assumption regardless of the chosen condition (more frequent vs less frequent check ins).

2. There will be a significant decrease in the levels of anxiety, negative affect, worry, and rumination, as well as in positive changes in mental functioning (attention,

inhibition, mindfulness, cognitive flexibility, emotion regulation, and a sense of meaning in life) among individuals undergoing a darkness retreat.

3. Considering that a participant in a retreat needs time for internal exploration, we hypothesize that the protocol with standard (less frequent) psychological consultations will be more effective with regard to the improvements defined in H2 compared to the protocol with enhanced (more frequent) consultations.

4. At the follow-up assessment, changes defined in H2 and the hypothesized group differences (h3) will be stably observed.

5. Individual characteristics, such as readiness to change and expectations regarding the experience, measured immediately before the intervention, will moderate the immediate effects of the darkness retreat.

6. Client satisfaction and subjective ratings of the experience's impact, measured immediately after the intervention, will moderate the long-term effects of the darkness retreat (at follow-up).

Procedure

Recruitment stage

Participants will be recruited among university students through a **two-stage process**.

Stage I

Individuals expressing interest in participating in the study will first be asked to confirm that they are not currently undergoing psychotherapy or coaching, are not taking psychotropic medication, and are in generally good physical health.

The following exclusion criteria will apply:
diagnosed acute or chronic somatic illness (e.g., cardiovascular diseases); psychiatric or neurological disorders (e.g., depression, addiction, bipolar disorder, schizophrenia, epilepsy, stroke, traumatic brain injury, Parkinson's disease, Alzheimer's disease, or other forms of dementia); active suicidal ideation with plan or intent; current use of psychotropic medication; and pregnancy.

Initial verification of the above criteria will be conducted through a screening questionnaire containing demographic questions and items regarding psychotherapy/coaching, psychotropic medication use, somatic health, suicidal

ideation, pregnancy, and any lifetime diagnoses of behavioral or psychiatric disorders, including psychotic disorders, eating disorders, obsessive-compulsive disorder, substance use disorders, bipolar disorder. The screening will also include the following self-report questionnaires (using their Polish adaptations):

- **PSWQ**: **Inclusion criteria based on the PSWQ (Penn State Worry Questionnaire, Meyer et al., 1990.):**
  To be considered for participation, individuals must obtain a total score between **40 and 80, i.e. moderate or high level of worry**.In cases where participants fall within the high range (>60), if clinical levels of worry are identified during the clinical interview, they will be excluded from participation.

- **PHQ-9 (Spitzer et al., 1999)** : Scores above 10 will be interpreted as elevated risk of depression; individuals scoring 20 or more will not be invited to the clinical interview.

- **GAD-7 (Spitzer at al., 2007)**: Scores of 7 or more will be considered indicative of elevated generalized anxiety symptoms; individuals scoring 15 or more will be excluded from further participation.

- **AUDIT (WHO, 2001)**: A score above 8 will indicate increased risk of problematic drinking; individuals scoring 22 or more will not be invited to the clinical interview.

- **DUDIT (WHO, 2001)**: A score above 4 will be interpreted as elevated risk of substance use; individuals scoring 7 or more will be excluded from the study.

The questionnaire will also include the following DSM-5-based screening tools (APA, 2013), which will not lead to automatic exclusion. However, results exceeding the following thresholds will require in-depth assessment during the clinical interview:

- **DSM-5 – Panic Disorder**: score ≥ 26

- **DSM-5 – Social Anxiety Disorder**: score ≥ 26

- **DSM-5 – Post-Traumatic Stress Disorder (PTSD)**: score > 22

STAGE II

To exclude personality disorders, a two-step procedure will be implemented. First, participants will complete the Personality Belief Questionnaire (PBQ; Beck & Beck, 1991) approximately one week before the scheduled interview; an elevated intensity of certain dysfunctional beliefs may indicate a possible personality profile. This will then be verified by a psychologist during the clinical interview using the Structured Clinical Interview for DSM-5 Personality Disorders (SCID-5-PD; First et al., 2016). Additionally, in order to exclude other mental health disorders (e.g., anxiety disorders, substance use disorders, claustrophobia, or PTSD), the psychologist will use the MINI measure (M.I.N.I. 5.0.0; Sheehan et al., 1998).

Participants who complete the psychological interview—regardless of their final qualification for the study—will receive a compensation of approximately 200 ZŁ in shopping vouchers (50EUR).

Ethical considerations

The research procedure was submitted for evaluation by the Commission for Ethics in Empirical Research Involving Human Participants at SWPS University. All modifications to the original study protocol have been conducted in strict accordance with the guidelines of the SWPS University Ethics Committee. The project received formal approval (No. 2025 - 288) and all subsequent procedural updates were officially authorized under amendment aneks_2025-288**.**

Participants

The study sample will consist of 20-30 students aged 30-50. Eligible participants will be characterized as high-worrying (> 1 SD above the mean in PSWQ), yet classified as psychologically healthy based on screening and clinical interview results.

All participants will be assigned to one of two experimental subgroups, both of which will undergo the darkness retreat condition. The groups will differ in the frequency and structure of psychological monitoring during the retreat:

- **Group 1** will follow low frequency monitoring with the standard consultation schedule established by the standard consultation schedule will follow the protocol established by the **Within – The Ultimate Darkness Retreat team (the study's host facility and sponsor)** in Wróblewo, Poland. Monitoring will

occur once per day in conjunction with meal delivery.

- **Group 2** will receive high frequency monitoring, i.e. psychological check-ins, suggested at regular 3-hour intervals during waking hours. This approach aims to increase psychological safety and allow for more robust, time-sensitive data collection throughout the retreat experience.

Participants who enter the cabin will receive a compensation of 900 PLN in shopping vouchers (approximately 210 EUR). This payment will be provided regardless of whether they complete the entire experiment or choose to withdraw at any point. Additionally, they will receive 400 PLN in shopping vouchers (~100 EUR) for completing follow-up questionnaires six months after the retreat experience.

Study Design and Methodology

- **Intervention Model (Parallel Assignment):** The study is conducted at a specialized facility in Wróblewo, Poland, which has five available darkness cabins. Participants are organized into "slots" of five people per session. Within each slot, two intervention groups (High Frequency Monitoring vs. Low Frequency Monitoring) run in parallel. Due to the facility's capacity, the groups are distributed in a 2:3 or 3:2 ratio, and this distribution alternates with each subsequent slot to ensure balance across the study.
- **Allocation (Randomized/Pseudo-randomization):** Participants are assigned to one of two groups (High vs. Low Frequency Monitoring) via block randomization. To maintain optimal monitoring standards within the facility's capacity, an alternating 2:3 or 3:2 allocation ratio is applied across four dedicated session slots. Group assignment is revealed to participants immediately following the completion of the first wave of questionnaires (baseline), prior to the start of the retreat.
- **Masking (None / Open Label with Limited Initial Disclosure):** This study is primarily open-label; however, a degree of limited disclosure is used during the recruitment phase to minimize expectancy bias. During initial screening, participants are informed they are applying for a "retreat study" focused on psychological well-being. They are not initially informed about the darkness component or the specific monitoring frequency. Detailed information about the darkness retreat is provided only after successful qualification. Full unmasking regarding the study's primary scientific objective (feasibility and protocol testing) will occur after the final follow-up assessment.

- **Informed Consent and Decision Process:** The participation decision is a multi-stage process. Potential participants first express interest based on general information. After the recruitment and qualification phase, they receive comprehensive details about the darkness retreat and the monitoring conditions, at which point they make a definitive decision to participate. The formal **Informed Consent Form (ICF)** is physically signed on-site at the facility in Wróblewo before the intervention begins.

Individuals who meet the eligibility criteria will be informed about the specific nature of the intervention (darkness retreat). After confirming their willingness to proceed, participants complete the baseline assessments (Wave 1). All baseline assessments but one are completed 3 days (Friday) before coming to the research facility in Wróblewo (Monday). For legal reasons, the State-Trait Anxiety Inventory (STAI) must be completed in person in hard copy upon arrival at the research facility.

Following these assessments (Wave 1), participants are assigned via pseudorandomization to one of two conditions: either low or high frequency of monitoring via psychological consultations. Subsequently, on the day of assignment, participants receive an email notification informing them of the specific condition to which they have been allocated

Study Facility and Participant Support

The study will be conducted at **Within – The Ultimate Darkness Retreat**, located in Wróblewo (the designated **facility**). All accommodation and meals during the study will be fully covered by the organizers.

To ensure participant safety, a psychologist (supervisor) will be appointed to monitor participants through scheduled psychological consultations (available at high or low frequency) and provide emergency support if needed. To minimize researcher bias, the appointed supervisor will have no prior experience with the darkness retreat.

Study Phase I: Pre-arrival Assessment

Three days before the scheduled arrival, participants will receive a set of online questionnaires to complete (using their Polish adaptations where applicable). This first wave of assessment focuses on the following measures:

1. Negative Affect Measures:

- **Ruminative Thoughts Questionnaire** (Baryła & Wojciszke, 2005)

- **Penn State Worry Questionnaire** (PSWQ; **Meyer et al., 199;**)
- **CESD-R** (Radloff, 1977)
- **STAI** (Spielberger et al., 2011)

2. Positive Mental Health Measures:

- **Abbreviated version of the Five-Facet Mindfulness Questionnaire** (Bohlmeijer, et al., 2011)
- **Meaning in Life Questionnaire** (MLQ; Steger at al., 2006)
- **Self-Compassion Scale – Short Form** (SCS-SF; Raes i in., 2006)
- **Heart Rate Variability (HRV)**

3. Cognitive Functioning Tests:

- **Behavioral go/no-go tests**

4. Controlled Variables:

- **Personal Development Initiative Scale** (Borowa et al., 2020)
- **Credibility/Expectations Questionnaire** (Devilly & Borkovec, 2000)

5. Physiological Monitoring: Participants in both groups will be equipped with WHOOP wristbands – wearable devices designed to monitor physiological activity. These wristbands will serve a dual purpose: from a research perspective, they will provide access to biological data such as circadian rhythm patterns and heart rate variability (HRV), offering deeper insights into the physiological processes accompanying the darkness retreat experience. From a safety perspective, they will enable real-time monitoring of participants' condition, supporting one of the main goals of the pilot study: ensuring participant safety while assessing the feasibility of the proposed research procedure.

Day 1 (Arrival & Preparation)

On arrival (Monday afternoon), participants will be welcomed and given a tour of the facility by their supervisor on site.

- Participants will first read the informed consent form, which will then be discussed with a **Supervisor**. After this discussion, participants will sign the document before proceeding. In the following step, participants will complete the State-Trait Anxiety Inventory (STAI) on-site. Subsequently, the Supervisor will then discuss the course of the first two days at the facility Subsequently,

and then they will participate in a brief one-on-one mindfulness training session.
- Participants will be then shown the darkness cabins
- Those who agree to participate will then spend a trial night in the assigned cabin, exiting the next morning.

Day 2 (After the trial night)

- The next day, they will meet with the supervisor to discuss their initial experiences and confirm or decline further participation.
- Participants attend provided meal, and rest.

Days 2–5 (Main Experiment in Retreat Conditions)

- Participants will enter the darkness cabin after group breakfast around 11 of the second day and remain there until around 11 AM the morning of the fifth day.
- They will have no access to mobile phones, laptops, or watches.
- Meals will be provided without direct interaction with others.
- Participants will be free to leave the cabin at any time and may seek assistance from the supervisor if needed.
- Depending on their assigned condition, participants staying in the darkness retreat cabin will undergo **standardized interviews conducted by a supervisor** during the retreat. The frequency and structure of these interviews will differ based on group allocation (low vs high frequency monitoring (i.e. psychological consultation) group), but all interviews will follow a predefined protocol to ensure consistency and participant safety.

Post-Study Assessments (Exit Measures in Wróblewo)
Upon completion of the retreat (day 5), participants will be asked to complete the same set of questionnaires/tests as described above (points 1–4) and additionally:

- **Post-Traumatic Growth Inventory** (PTGI) (PTGI; Tedeschi & Calhoun, 1996);
- **Negative Effects of Intervention Questionnaire** (NEQ; Rozental et al., 2016, 2019)
- **Client Satisfaction Questionnaire** (Larsen et al., 1979).

After assessments participants who wish to do so will have the opportunity to discuss their experiences with the study supervisor (The Supervisor uses only basic helping tools, such as paraphrasing and reflecting).

Six-Month Follow-Up

To assess the long-term persistence of observed changes, participants in all groups will complete the following questionnaires:

- Ruminative Thoughts Questionnaire (Barilla & Wojciszke, 2005)
- Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990)
- CESD-R (Radloff, 1977)
- Go/no-go behavioral tests
- Abbreviated version of the Five-Facet Mindfulness Questionnaire (Bohlmeijer et al., 2011)
- Meaning in Life Questionnaire (MLQ; Steger et al., 2006)
- Self-Compassion Scale – Short Form (SCS-SF; Raes et al., 2011)
- Post-Traumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996)
- Personal Development Initiative Scale (Borowa et al., 2020)
- Credibility/Expectations Questionnaire (Devilly & Borkovec, 2000)
- Negative Effects of Intervention Questionnaire (NEQ; Rozental et al., 2016, 2019)

Following the follow-up assessment, participants will receive a personalized email explaining the study's true objectives and the necessity of initial limited disclosure to maintain scientific integrity. The communication will include a PDF debriefing form with instructions for withdrawing data and a link to an online survey to confirm understanding or request a meeting with the research team. Every participant retains the right to have their data permanently deleted and can schedule a private online consultation with a psychologist to discuss their experience.

2. Statistical analysis plan

2.1. General Analytic Strategy

- Statistical analyses for primary and secondary outcomes will be performed using **Linear Mixed-Effects Models (LMM)**.
- LMM was chosen to account for the hierarchical structure of the longitudinal data (observations nested within participants) and to handle unbalanced data without ad-hoc imputation.
- Parameters will be estimated using the **Full Information Maximum Likelihood (FIML)** method.
- Analyses will follow both **Intention-to-Treat (ITT)** and **Per-Protocol (PP)** approaches.

2.2. Model Specification and Hypothesis Testing

The core model will include **Time** (Baseline, Post-intervention, 6-month Follow-up), **Group** (High vs. Low Monitoring), and the **Group × Time interaction** as fixed effects. A random intercept for each participant will be included to account for individual baseline variability.

- **Testing Intervention Efficacy (H2):** Evaluated via the **Main Effect of Time**. A significant reduction in scores (e.g., PSWQ, STAI) or increase in positive functioning (e.g., FFMQ, MLQ) from Baseline to Post-intervention will support the efficacy of the Dark Retreat.
- **Testing Group Differences (H3):** Evaluated via the **Group × Time interaction**. We hypothesize that the standard (low-frequency) monitoring group will show greater improvements compared to the high-frequency group.
- **Testing Long-term Stability (H4):** Evaluated via planned contrasts comparing 6-month Follow-up to Baseline. Stability is confirmed if the Follow-up scores remain significantly improved relative to Baseline.

2.3. Outcome Measures Classification

- **Primary Outcome:**
    - **Pathological worry**: Measured by the Penn State Worry Questionnaire (PSWQ).
    - **Study Protocol Feasibility:** Measured by objective recruitment and retention metrics, specifically:

      Completion Rate: Percentage of participants who complete the full 5-day dark retreat.

Retention Rate: Percentage of participants who complete the 6-month follow-up assessment.

Safety: Incidence of emergency consultations and reports of adverse distress levels.

- **Secondary Outcomes:**
  - **Emotional Distress:** STAI-Trait, CESD-R, and Ruminative Thoughts Questionnaire (RTQ).
  - **Cognitive Performance:** Attention/Cognitive Stability (Omission Errors and Reaction Time Variability (RTV)), and Inhibition (Commission Errors) derived from the Go/No-Go task.
  - **Positive Mental Functioning:** Mindfulness (Five-Facet Mindfulness Questionnaire, FFMQ), Meaning in Life (Meaning in Life Questionnaire, MLQ), Post-Traumatic Growth (Post-Traumatic Growth Inventory, PTGI), and Emotion Regulation (Heart Rate Variability, HRV and Self-Compassion Scale – Short Form, SCS-SF).

2.4. Statistical Rigor and Assumptions

- **Multiple Comparisons:** The **Benjamini-Hochberg False Discovery Rate (FDR)** correction will be applied to all secondary outcome analyses to control for Type I error inflation.
- **Assumptions:** Normality and homoscedasticity of residuals will be verified. Skewed cognitive (RT, RTV) or physiological (HRV) data will be log-transformed prior to analysis.
- **Missing Data:** Handled via the LMM framework under the **Missing at Random (MAR)** assumption.

2.5 Moderation and Exploratory Analyses

To address **H5 and H6**, individual traits (Readiness to Change and Expectations assessed at pre-treatment and Satisfaction assessed at post-treatment) will be entered as continuous moderators into the LMMs. Due to the pilot nature of the study (N=20), these analyses will be treated as exploratory.

2.6. Feasibility and Safety (H1)

The feasibility of the study protocol, defined as a primary outcome, will be assessed using the following descriptive metrics and pre-defined benchmarks:

- **Recruitment Feasibility:** Measured by the time required to fill each study slot (target: <3 months per 5-person cohort).

- **Retention and Completion:** Assessed by the completion rate of the 5-day retreat (target: >80%) and the retention rate at the 6-month follow-up (target: >70%).
- **Adherence:** Defined as the degree to which participants follow the intervention schedule, with a protocol deviation threshold of no more than one-hour delay in psychological consultations.
- **Data Completeness:** Evaluated by the percentage of successfully collected self-report, behavioral, and physiological (HRV) data.
- **Safety and Adverse Events:** Monitored through the incidence of emergency psychological support requests (target: ≤2 per session slot) and post-intervention distress reporting.