

TITLE: Brief Group Acceptance and Commitment Therapy for Insomnia: Study Protocol for a Randomized Controlled Trial

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Supplementary Material 1. Detailed description of the treatment intervention and placebo sessions

In the current study, the original six-session group ACT protocol by Ferreira et al., (2024) was condensed into two 120-minute sessions, maintaining the same thematic structure. All the rights to the creation of the ACT-i group intervention and the organisation of the therapeutic exercises belongs to Ferreira et al., (2024).

Attached below is the structure of each adapted session and the therapeutic exercises that are going to be implemented. The main aim of the sessions is to target psychological flexibility, acceptance, mindfulness and values-based actions, while facilitating learning through several metaphors.

Session 1. The first session aims to introduce participants to the structure and goals of the program, establish group rapport and confidentiality, discuss the personal and functional impact of chronic insomnia and introduce experiential exercises related to awareness, acceptance and cognitive defusion.

Introduction and group setting. First, the facilitator welcomes participants, introduces the purpose and structure of the two-session program and emphasizes confidentiality rules, encourages active participation and promotes emotional safety. Each participant is going to briefly introduce themselves by answering three reflective questions („Who am I?”, „What brought me here?”, „What do I like to do/ want to gain from this experience?”) (Ferreira et al., 2024).

Using the „Wound metaphor” and encouraging a brief discussion on participants’ experiences with insomnia. The therapist explains the „Wound metaphor”, to explore how

discomfort maintains suffering and how approaching discomfort with openness facilitates healing. Participants are going to be encouraged to reflect on this metaphor and how it applies to their experience with insomnia.

Three cartoon presentations and group reflections on them. Participants view three short comic strips representing different experiences of insomnia and will be invited to share which stories resonate with their own the most. The members will be encouraged to share similarities or dissimilarities with the others' stories. The brief discussion will focus on shared experiences.

Brief psychoeducation on sleep and insomnia. The therapist provides concise scientific information about sleep and what insomnia is. For example, about its biological functions, recommended duration of sleep and the variability across individuals. The therapist provides information about the consequences of sleep deprivation in a concise manner (i.e., sleepiness during the day, difficulties in emotion regulation, the effects on weight, the structure and function of the brain).

Overview of sleep hygiene factors and encouraging brief discussions about encountered barriers (if they previously applied them and did not work out). Participants will briefly be shown a visual summary of general sleep hygiene factors, such as sleep environment, daily routines, diet, physical activity and evening routines. The discussion will highlight the role of worry in the maintenance of insomnia and the exercise of writing down one's thoughts for five minutes on a piece of paper was prescribed. For more details regarding its format, please consult Ferreira et al., (2024).

Brief mindfulness-based grounding exercise. A guided body-scan exercise will be conducted to promote awareness of present-moment sensations and bodily relaxation. Participants will be

instructed to notice sensations non-judgementally and return their attention to the present moment each time they are distracted by internal (e.g., thoughts) or external factors.

Brief discussion on helplessness and control. The therapist will explore with the group the sense of helplessness associated with insomnia. Using the „tug-of-war with the monster” metaphor, participants will reflect on the futility of struggling with unwanted internal experiences and the alternative of letting go of excessive control. To facilitate the brief discussion and to facilitate understanding, visual materials will be provided.

Brief cognitive defusion exercise. The therapist leads the „Leaves on a stream” exercise, guiding participants to observe their thoughts, rather than criticize and challenge them. Participants will be encouraged to notice the thoughts as they come and go, without reacting to them in any way. Here, brief group discussion about their experience are encouraged.

Summary and homework. Participants will be encouraged to review the sleep hygiene summary, practice journaling their thoughts and worries before bedtime and to repeat the relaxation and defusion exercises daily until the next session.

Session 2. The second session aims to deepen the understanding of acceptance and experiential avoidance, explore the distinction between pain and suffering, connect participants with their values and translate those values into meaningful behavioral actions.

Review the assigned homework, overcome barriers and have a general check-in with the group. Participants will briefly share experiences and difficulties encountered when practicing the assigned exercises. The therapist will assess the encountered barriers, normalize the experiences and emphasize ways of implementing the recommendations.

Brief discussion on pain versus suffering. The therapist will introduce the conceptual difference between pain, as in the inevitable experience of loss, insomnia, and suffering, as in the secondary distress generated by avoidance and control efforts. Moreover, it will be discussed that avoidance behaviors often perpetuate distress. The „Carla and the pudding” metaphor is used to illustrate how avoidance of discomfort can progressively narrow life experiences. Participants will reflect on parallels between this metaphor and their experience with insomnia, and the “Chinese finger trap” example will be briefly discussed to illustrate the paradox of control.

Acceptance and emotional awareness. The facilitator introduces the concept of acceptance as the willingness to experience unpleasant internal events without avoidance. A poem will be read and briefly discussed as a metaphor for “welcoming” emotions and thoughts as guests. Participants will be invited to share short reflections on how they relate to their emotions.

Brief self-as-context exercise. Participants will write positive and negative thoughts, memories and emotions on opposite sides of a sheet of paper that they have prepared from the beginning of the session. The exercise shows that both pleasant and unpleasant experiences coexist and do not define the self. Participants will be encouraged to identify an activity they had stopped engaging in because of difficult thoughts or emotions and to plan re-engagement with that activity as homework.

Brief values clarification exercise. Using an interactive digital tool (Canva), the facilitator guides participants through a “Life Domains and Values” exercise. Participants will identify key personal values across major life areas (e.g., relationships, work, health, personal growth) and rated each domain for importance (0–10) and current investment (0–10). The exercise emphasizes the distinction between values (ongoing life directions) and goals (specific

achievable outcomes). Through group discussion, participants will be encouraged to formulate small, practical actions aligned with their values.

Explaining the metaphor of the unwanted guest. The facilitator presents the “party guest” metaphor to illustrate how rejecting unwanted internal experiences (e.g., intrusive thoughts, anxiety about insomnia) restricts engagement in valued living. The metaphor encourages acceptance of unpleasant mental events while remaining engaged in meaningful life activities.

Brief values-based imagery exercise. A guided imagery exercise will invite participants to connect with a personally meaningful value and notice associated bodily sensations. Participants will alternate between awareness of a current difficulty and the chosen value, linking both through mindful breathing. When inhaling, they will have to connect with their discomfort and when exhaling, they will have to connect with their value. The exercise aims to integrate acceptance and commitment to values-driven action.

The “epitaph” exercise and brief discussions on personal values. Participants reflect on legacy, mortality and the kind of person they wish to be remembered as, linking these reflections to personal values and life direction.

Homework and closure. Participants will be encouraged to maintain regular sleep hygiene routines, write down worries or intrusive thoughts before bedtime, observe avoidance tendencies and choose acceptance instead, engage in at least one action consistent with their identified values, regardless of sleep quality, practice relaxation or defusion exercises daily. The facilitator will thank participants and inform them about upcoming follow-up assessments at 2 weeks and at 3 months.

In the current study, the authors developed two brief placebo intervention sessions, designed to follow a non-directive, discussion-based approach focused on sharing participants' experiences. Each session had 120-minutes.

Session 1. The first session aims to introduce participants to the program, establish group rapport and provide a safe space for them to discuss personal experiences with insomnia, stress and their lifestyle. The session will focus on non-directive, experience-sharing discussions, allowing participants to reflect on their relationship with sleep, identify sources of stress and explore daily routines and cultural or social factors influencing their well-being.

Introduction, rules on confidentiality and establishing group rapport. The session begins with the therapist welcoming the participants and introducing the purpose and structure of the two-session program on chronic insomnia. The facilitator explains confidentiality and participation rules, such as that all discussions during the sessions are strictly confidential. Participants confirm their commitment to confidentiality and emotional safety for all group members. Active participation is encouraged.

Participant introductions. Each participant is going to briefly introduce themselves by answering three reflective questions („Who am I?”, „What brought me here?”, „What do I like to do/ want to gain from this experience?") (Ferreira et al., 2024). The facilitator models their own responses first.

Reflections on sleep. Participants reflect on their personal relationship with sleep. Each participant shares one word or short phrase describing how they relate to sleep (e.g., “fragile,” “unfriendly”). The facilitator then invites participants to pose a question they would ask their sleep, prompting reflection on their personal experience.

Brief discussions about sleep. Participants engage in an open conversation on sleep, guided by the facilitator. They are encouraged to answer several questions, such as “What does good sleep mean to you?”, “Does anyone’s definition differ from her/his?”, “Recall a time when you slept well.”, “Recall when your sleep quality began to change or decline.”, “What benefits do you notice after a good night’s sleep?”, “What consequences do you experience when sleep is poor and which aspects of life are affected first?”. The facilitator will summarize participant responses regarding these consequences and they will be visually represented using Canva to create a group board with their answers.

Brief discussion about insomnia. Participants watch a short video where an individual describes their personal experience of insomnia, on Youtube, shared by the therapist. After viewing, participants discuss the similarities and differences between their own experiences and those in the video and reflect on additional symptoms they may notice in themselves.

Brief discussion about lifestyle. Participants discuss the concept of a healthy lifestyle and its relationship to sleep, without receiving prescriptive advice or confirming what “good”/ “healthy” lifestyles mean. They are going to answer two questions: “What does a healthy lifestyle mean to you?”, “What was your life like when sleep came more easily and what activities or routines were involved?”.

Discussion on balancing daily activities with rest. The facilitator encourages reflection on participants’ daily activity and rest, by answering several questions, such as: “How do you balance daytime activity with rest?”, “Which activities help you relax?”, “How do you notice when you are relaxed or stressed?”, “How does your body feel in relaxed versus stressed states?”.

Brief discussion about stress. Participants explore stress and its impact on daily life. The therapist encourages answers on several reflective questions, such as: “What is stress for you?”, “When did you last experience intense stress and how did it affect you?”, “How do you recognize stress physically and emotionally?”, “Can you recall situations where stress helped you versus situations where stress interfered?”, “Do you notice a connection between stress and sleep in your life?”. The therapist normalizes variability in stress responses, without providing prescriptive advice and without categorizing any given responses as “adaptive” or “maladaptive.”

Cultural and social influences on stress. Participants discuss how cultural or social contexts influence their perception of stress and explore differences across generations or social environments in how stress is recognized and discussed.

Homework and reflections for next session. Participants are asked to note five activities or situations that generate high stress in their phone’s notes application to discuss in the next session. The session concludes with brief reflections from participants on their experience, such as “How was today’s session?”, “How was it to discuss sleep in a group?”, “What surprised you about this experience?”. The facilitator reminds participants of the date and time of the next session.

Session 2. The second session focuses on participants’ reflections regarding stress, daily routines and expectations about sleep. The session aims to facilitate open discussion and self-observation, without providing any psychoeducation, cognitive or behavioral guidance. The session includes group reflection on expectations about sleep, personal coping experiences and the subjective meaning of well-being. The overall goal of this session is for the therapist to

continue to create a reflective and supportive group space, emphasizing descriptive sharing information, rather than instructions or skills training.

Reconnecting with the participants. The facilitator welcomes participants. Before starting, the facilitator invites the participants to brief reflections, by answering several questions, such as “Was there anything from the previous session that stayed with you?”, “Have you noticed anything new about your lifestyle over the past week?”.

Brief discussion about the homework. Participants are invited to share their notes from the homework task: “What are the five activities or life situations that cause you the most stress?”. All participants who wish to share are given the opportunity to speak. The facilitator listens attentively without interpreting or evaluating responses.

Discussion about evening routines. The facilitator opens a discussion on evening habits and the transition to sleep through general questions: “What does a typical evening look like for you, from the end of daily activities until bedtime?”, “What do you usually do in the last one to two hours before sleep?”, “Do you have specific habits or markers related to bedtime, or is it more random? How do you usually feel during that time?”, “What happens when the bedtime you were hoping for gets delayed?”, “What thoughts or physical sensations do you notice in the evening?”, “If you wake up during the night, what usually happens? What do you do?”. After a few participants share, the facilitator invites others to compare or contrast their experiences. No discussion of “good” or “healthy” sleep rules is included. The content remains descriptive, not prescriptive.

Discussion about morning routines. Participants discuss their mornings after the therapist encourages such discussion thorough open-ended questions, such as “What do your mornings

usually look like?”, “What makes a morning good or difficult for you?”, “What do you feel in the first moments after waking up?”, “How do you react to your alarm?”, “Are your weekday mornings different from weekends? If yes, how? What about holidays or busy days?”

Discussion about personal strategies for coping with insomnia. The facilitator invites participants to reflect on their own ways of managing frustration related to poor sleep. We must emphasize that the goal is on sharing the experience and not guiding the participants. The therapist asks several questions, “What has helped you in the past to deal with frustration from sleepless nights or disrupted routines?”, “What habits help you navigate stress and insomnia?”, “What have you noticed helps you fall asleep more easily? Does it help in the long term?”. The therapist listens without validating, correcting or offering any recommendations. Participants are not encouraged to imitate or adopt others’ strategies.

Discussion on expectations about sleep. The facilitator introduces a reflective reading exercise/ vignette, by reading it out loud: “Last night I woke up several times and hoped it wouldn’t happen. I’m not sure why I kept waking up. I got out of bed once, drank some water and returned. I lay in the dark for a while. Eventually, I fell asleep again, but I don’t know how long it took. In the morning, I opened my eyes without the alarm. I wasn’t sure if I had slept much or little. I felt groggy and hoped to feel rested. Still, I don’t know why I expected that, it’s been like this for years. Also, I didn’t remember my dreams, again. I wonder if I even dream. I wish I was the type of person that dreams more often.” The therapist encourages the discussion on expectations through several open-ended questions, such as “What expectations does this person seem to have about sleep?”, “What expectations do you have about sleep? How do you think you ‘should’ sleep?”, “What influences your image of what a good night’s sleep means? Is it based

on another person or on a common social idea?”. The facilitator guides reflection without judgment or correction.

Discussion about well-being. The therapist transitions to a broader discussion about well-being. He/ She will begin that by using reflective questions, such as “When you hear the expression “well-being”, what comes to mind? What do you think contributes to a balanced life?”, “What small things bring you a sense of well-being or help you maintain balance despite difficulties?”

Reflection on the sessions. The session closes with a reflective group discussion about the discussed topics. Participants are asked “How was this experience for you?”, “Did anything change for you through these sessions?”, “What stays with you after these discussions?”.

Supplementary Material 2. Detailed description of facilitators and delivery characteristics

The interventions will be delivered by two trained psychotherapists. Each group will be conducted by one facilitator with a background in clinical psychology and psychotherapy, with up to two years of clinical experience. The training and supervision will be provided by a licensed clinical psychologist and psychotherapist, who is also a PhD student with clinical experience in Acceptance and Commitment Therapy (ACT) and sleep interventions. To ensure treatment fidelity, all facilitators will follow the standardized session-by-session protocol corresponding to each treatment group. Moreover, they will have to attend supervision meetings throughout the process. The supervision meetings will focus on maintaining adherence to the manual and addressing implementation challenges.

All sessions will be conducted in a synchronous group format, including 5–7 participants per group. The sessions will take place separately, but concurrently (i.e., at the same time and on the same day), ensuring equivalent conditions for both study arms. They will be conducted online, using Google Meet, once per week for two weeks, with each session lasting 120-minutes. All participants will be asked to have their cameras and microphones active to enhance engagement and to support the creation of a safe and interactive environment. If any technical difficulties will be encountered, the facilitator has to take a few minutes to try and manage the situation, encourage problem-solving and full participation. At the beginning of the first session, facilitators will establish clear group rules, emphasizing confidentiality, mutual respect and voluntary participation. Facilitators will encourage equal participation, manage time fairly among participants (e.g., they will make sure that talkative participant do not dominate the whole session) and ensure that all interactions are respectful, contained within the objectives of the session. Across the two conditions, the facilitators will maintain a positive therapeutic climate

and impose professional boundaries, while keepind a non-directive stance and avoiding the introduction of any therapeutic components in the attentional control group.