

STUDY PROTOCOL

Open Access



# A Suicide Attempt Multicomponent Intervention Treatment (SAMIT Program): study protocol for a multicentric randomised controlled trial

Anna Beneria<sup>1,2,4,5\*</sup>, Anna Motger-Alberti<sup>2,10\*</sup>, Marta Quesada-Franco<sup>1,2,4,5</sup>, Gara Arteaga-Henríquez<sup>1,2,4</sup>, Olga Santesteban-Echarri<sup>3</sup>, Pol Ibáñez<sup>2</sup>, Gemma Parramon-Puig<sup>1,2,5</sup>, Pedro Sanz-Correcher<sup>6,7</sup>, Igor Galynker<sup>8</sup>, Josep Antoni Ramos-Quiroga<sup>1,2,4,5</sup>, Luis Pintor<sup>4,9</sup>, Pol Bruguera<sup>10</sup> and María Dolores Braquehais<sup>2,5,11</sup>

## Abstract

**Background** Suicide has become a first-order public health concern, especially following the negative impact of COVID-19 on the mental health of the general population. Few studies have analysed the effects of early psychotherapeutic interventions on subjects who have attempted suicide, and even fewer have focused on those hospitalized in non-psychiatric units after a Medically Serious Suicide Attempt (MSSA). The main aim of this study is to describe the protocol designed to evaluate the effectiveness of individual psychological treatment for patients hospitalized after an MSSA. The secondary objectives of the study are: (1) to evaluate the impact on quality of life and other psychosocial variables of patients with a recent MSSA who receive early psychological intervention; (2) to analyse the biological, psychological, and clinical impact of early psychotherapeutic treatment on subjects hospitalized after an MSSA.

**Methods** A longitudinal randomised controlled trial will be conducted with patients over 16 years of age admitted to two general hospitals. The case intervention group will enrol for 8-sessions of individual psychotherapy, Suicide Attempts Multi-component Intervention Treatment (SAMIT), combining Dialectical Behaviour Therapy (DBT), Mentalization-Based Therapy (MBT), and Narrative approaches, while the control group will receive a treatment-as-usual intervention (TAU). Longitudinal assessment will be conducted at baseline (before treatment), post-treatment, and 3, 6, and 12 months after. The main outcome variable will be re-attempting suicide during follow-up.

**Discussion** Some psychotherapeutic interventions, usually implemented in outpatient, have proven to be effective in preventing suicidal behaviours. The combination of some of these may be a powerful treatment for preventing future SA in patients hospitalised after an MSSA, which is the most severely suicidal subgroup. Moreover, assessment of the biological, clinical and psychometric impact of this new intervention on patients during the first year after the

\*Correspondence:

Anna Beneria  
anna.beneria@vallhebron.cat  
Anna Motger-Alberti  
anna.motger.ext@vhir.org

Full list of author information is available at the end of the article



© The Author(s) 2024. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

attempt may help understand some of the multi-level factors associated with the effectiveness of psychotherapeutic interventions in MSSAs. The prevalence of high suicide rates requires the design of effective psychological interventions for their prevention, and also in order to design new pharmacological and psychological treatments.

**Trial registration** ClinicalTrials.gov ID: NCT06238414. Date of registration: 1st February 2024, final update is protocol version 3.0, 19th March 2024.

**Keywords** Suicide attempt, Medically Serious Suicide Attempts (MSSA), Psychotherapy, Intervention, Randomised controlled trial, Psychotherapeutic intervention

## Background

Every year, more than 700,000 people die from suicide [1] and the percentage of unsuccessful attempts is much higher. Death by suicide is intrinsically tragic, and also has an emotional impact on family and beloved ones [2, 3]. A better understanding of the underlying causes of suicide, and better practices designed to assess, prevent, and treat suicidal behaviour, has been identified as a public health priority [4]. The Spanish National Institute of Statistics (INE) [5] reported that 21,697 people died in 2020 in Spain as a consequence of mental disorders, ranking sixth in causes of death in the CIE-10 classification. Moreover, in 2022, 4,227 deaths by suicide were reported in Spain, 5.6% more than the year before [6].

While suicide rates are higher in men than in women, suicide attempts (SA) are more frequent among women [1]. A previous SA is the most important risk factor for re-attempting and supposes a greater risk of dying by suicide [7–10]. During the COVID-19 pandemic, there was a significant increase in the number of consultations for suicidal ideation as well as in the number of SAs and deaths by suicide [7]. Similarly, recent epidemic outbreaks such as the SARS-COV-1, the MERS, or the Ebola virus, point to an increase in the incidence of suicidal behaviours in the short- and mid- long-term [8].

## Medically serious suicide attempts

MSSAs include those attempts where hospitalisation is required due to the medical severity [9–12]. The criteria for defining an MSSA are heterogeneous. Beautrais et al. [13] provided the most specific clinical criteria to define this type of attempts, namely that MSSA involves being hospitalization from the emergency department for more than 24 h and also meeting the following criteria: (a) treatment by specialised medical units; (b) surgery under general anaesthesia; (c) extensive medical treatment; and/or, (d) having used a highly lethal method despite not needing specialised or extensive medical or surgical treatment [10–12]. Individuals who attempt MSSA belong to a relevant group from a clinical perspective as they are very similar to those who do commit suicide, thus representing overlapping populations [10]. According to Beautrais et al. [12], most diagnosis of MSSAs as a subset were related to affective disorders,

substance use disorders, antisocial behaviours, and psychotic illnesses. Beautrais et al. [10] proposed that there are shared variables between suicide fatalities and MSSA, including social deficits, psychiatric pathology, previous suicide attempts, and recent exposure to stressors in life. The same researchers stated that 37% of MSSA patients had attempted suicide at some point during their study's follow-up, and 7% had died by suicide in a 5-year prospective analysis [13].

## Gender perspective

Suicidal ideation and behaviours are known to be influenced by gender and sex factors [14–17]. While deaths by suicide are more frequent among men compared to women, these are more likely to have suicide attempts than men. Significantly, they have a similar distribution when it comes to MSSA [14]. It is estimated that up to two-thirds of those who complete suicide are not in contact with the mental health services at the time of death [15]. Hamdi et al. [17] found that no-contact suicides were more likely to be men and not to be diagnosed with a mental disorder. The preponderance of men among those who complete suicide is a consistent pattern as is their reluctance to seek help prior to the suicidal action [18]. Seeking psychological treatment appears to be particularly challenging for some men [19] and there is evidence that men patients who self-harm often leave hospital without being assessed by the psychiatric team. Studying how these factors interact with suicidal ideation and behaviour could help to design more targeted psychotherapeutic and pharmacological treatments. Therefore, this study may provide a valuable insight into the gender-related factors associated both with MSSA and with response to a new early psychotherapeutic intervention.

## Theory models in the suicidal behaviours

Several bio-psycho-social models have been developed in recent decades to explain suicidal behaviours.

The interpersonal theory of suicide [20, 21] has substantially contributed to the comprehension of the suicidal mind [4]. This theory explains the process that leads from suicidal ideation to suicidal behaviours: (a) a frustrated sense of belonging that leads to isolation; (b)

distorted thoughts of uselessness and disability that combined with concurrent stressors lead to the perception of burdensomeness; and (c) the tolerance to suffer pain that in many cases may have been acquired after previous SAs [4, 18]. A key concept of this theory is the emphasis on why most individuals who think about suicide do not attempt or die by suicide.

The role of “unbearable mental pain” prior to suicidal acts has recently been postulated as a new hypothesis to comprehend this phenomenon. The authors theorized that SAs might involve mental pain far more frequently than the impulsive-aggressive behaviours [15]. In line with this hypothesis, Galynker’s theory [22], has recently postulated the Suicide Crisis Syndrome (SCS) model, as an acute mental state or cognitive, narrative, and affective dysregulation crisis that may precede suicidal behaviours [23]. Different elements have been studied to understand the characteristics of SCS in the high-risk for suicide inpatient population. The experience of entrapment, defined as the sense of urgency to get away from something that seems unavoidable and intolerable [24] has been found to play a significant role in these patients [25]. Previous insecure attachment style may act as trait risk factor that may increase the likelihood of such and experience of entrapment [25].

Several researches have also studied suicidal behaviour from a biological perspective [26, 27]. Despite the sustained emphasis on the role of (mainly serotonergic) neurotransmitter systems on suicidal behaviour [27–29], accumulating research has also suggested that immune/inflammatory and/or kynurenine pathway abnormalities may be a key to a biological substrate common to several types of mental suffering (or mental pain) and, therefore, could also be present in suicidal behaviours [30–32].

Abnormal levels of several immune cells [33] together with increased levels of pro-inflammatory cytokines, chemokine, and/or acute phase reactants have been repeatedly found in the blood, the cerebrospinal fluid (CSF) [26, 27, 34]. In addition, increased levels of Kynurenine (KYN) and/or Quinolinic acid (QUIN) have been repeatedly found in the blood and/or the CSF of individuals with suicidal behaviour [35], while treatments targeting inflammation and the kynurenine pathway have been found to potentially reduce the risk of committing suicide [36].

### **Psychotherapeutic interventions in patients with recent SAs**

Although there is growing evidence of the effectiveness on longer-term interventions, more intensive psychological therapies are needed to help prevent suicidal behaviour. Linehan et al. [37] and Yang et al. [38], found that levels of suicidal ideation, hopelessness, mental pain symptoms, and general psychopathology significantly

decreased in both treatment-as-usual and dialectical behavioural therapy (DBT) groups after treatment, but the effects were better maintained in the DBT cohort at 6-month follow-up. Another study using cognitive behavioural therapy (CBT) found a 60% reduction in the risk of future SA [39]. A new three-session psychotherapeutic treatment, Attempted Suicide Short Intervention Protocol (ASSIP), based on narrative psychotherapy, has provided even more support for the effectiveness of psychological treatment to reduce suicide behaviour through emotion regulation and cognitive flexibility [40, 41]. Finally, the use of Mentalization-Based Therapy (MBT) has shown encouraging results to reduce self-harm mainly in adolescents [42]. MBT has also been applied to adult patients with borderline personality disorder (BPD) with a high prevalence of SAs, demonstrating that MBT is helpful for treating BPD symptoms in general mental health settings [43].

However, most of the studies analysing the benefits of psychotherapy for reducing self-harm or on preventing of suicidal behaviours are centred on outpatient psychiatric care [44, 45]. There is no scientific evidence focusing on clearly designed interventions with hospitalised inpatients after an MSSA. Moreover, more controlled studies are needed to assess the influence of psychotherapeutic treatments during the immediate and intermediate phases after a MSSA to reduce the risk of repeating an SA.

Given the promising results of MBT, DBT, and narrative therapy to decrease future SA in other populations, we have designed an intervention that combines these approaches specifically targeting MSSA, the Suicide Attempts Multicomponent Treatment (SAMIT) program. It aims to potentiate the benefits of several evidence-based therapies in MSSA, and it will evaluate the effectiveness of this intervention in reducing the risk of reattempting suicide during the year after the MSSA, and assess the impact of the intervention from a multi-level perspective.

### **Methods**

This is the protocol of the SAMIT program, a multicentric Randomised Controlled Trial study, and the main objective of this research is to assess the effectiveness of an individualised psychotherapeutic intervention, specifically designed for individuals admitted to hospital following a MSSA. Secondary goals are as follows: (1) assess the effects of an SAMIT on the quality of life and other psychosocial variables in patients with recent MSSA; and (2) longitudinally examine the clinical, psychological, and biological correlation of SAMIT in subjects admitted to hospital following MSSA in the first-year post-treatment. The SAMIT protocol follows the SPIRIT recommendations [46] (see Fig. 1), and SPIRIT

Schedule of enrolment, interventions, and assessments (SPIRIT).

TIMEPOINT	t <sub>1</sub>	0	t <sub>1</sub>	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>	t <sub>5</sub>	t <sub>6</sub>	t <sub>7</sub>	t <sub>8</sub>	FU-3	FU-6	FU-12	
<b>ENROLMENT:</b>														
Eligibility screen	X													
Informed consent	X													
Blood analysis	X									X				
Baseline assessment	X													
Allocation		X												
<b>INTERVENTIONS:</b>														
SAMIT intervention			X	←————→						X				
TAU			X	←————→						X				
<b>ASSESSMENTS:</b>														
MOCA	X									X				
A-SCS-C	X									X*	X*	X*	X*	
C-SSRS	X									X	X	X	X	
SALSA	X									X*	X*	X*	X*	
SIS	X									X*	X*	X*	X*	
SSI	X									X*	X*	X*	X*	
HADS	X									X	X	X	X	
BHS	X									X	X	X	X	
BIS-11	X									X	X	X	X	
QOLS	X									X	X	X	X	
PS-E	X									X	X	X	X	
RFQ-8	X									X	X	X	X	
CaMi-R	X									X	X	X	X	

**MOCA:** Montreal Cognitive Assessment, **A-SCS-C:** Abbreviated Suicidal Crisis Syndrome Checklist, **C-SSRS:** Columbia-Suicide Severity Rating Scale, **SALSA:** Scale for assessment of lethality of suicide attempt, **SIS:** Suicide intent Scale, **SSI:** Suicide for suicide ideation, **HADS:** Hospital Anxiety and depression Scale, **BHS:** Beck Hopelessness Scale, **BIS-11:** Barratt Impulsiveness Scale, **QOLS:** Quality of Life Scale, **PS-E:** Psychache Scale, **RFQ-8:** The reflective functioning Questionnaire, **CAMI-R:** Short version of CaMir questionnaire, **SAMIT:** Suicide Attempt Multicomponent Intervention Treatment, **TAU:** Treatment as usual, **FU-3:** Follow-up at 3 months, **FU-6:** Follow-up at 6 months, **FU-12:** Follow-up at 12 months. \*only will be administered again in case of re-attempt during the treatment and follow-up period.

**Fig. 1** Schedule of enrolment, interventions, and assessments (SPIRIT)

checklist is provided in Supplementary Material eTable. S1. It has been registered at ClinicalTrials.gov with the identifier ID: NCT06238414. Date of registration: 1st February 2024, final update is protocol version 3.0, 19th March 2024.

**Study design**

A longitudinal randomised controlled trial will be conducted with patients hospitalised after an MSSA. After a baseline assessment, participants will be randomly allocated to two different treatment groups. The case intervention group will receive an 8-session psychological intervention (SAMIT program), while the control group

will be treated-as-usual (TAU). Longitudinal assessments will be conducted post-treatment, and 3, 6, and 12 months after SAMIT (Fig. 2).

The main outcome will be re-attempting suicide during the follow-up period. Secondary outcome measures will be related to biological parameters (pro-inflammatory cytokines and lipid profile; IL-6, C-reactive protein, Leukocytes, neutrophils, lymphocytes, monocytes, eosinophils, and basophils, as well as metabolites from tryptophan metabolism; tryptophan (TRP), serotonin (5-HT), kynurenine (KYN), kynurenic acid (KYNA), xanthurenic acid (XA), 3-hydroxykynurenine (3-HK), 3-hydroxyanthranilic acid (3-HAA), quinolinic acid (QUIN), and picolinic acid (PIC), as well as psychosocial variables (quality of life), and clinical variables related to psychopathological status, and variables related to suicide behaviour). Some of these factors will be longitudinally evaluated.

**Setting**

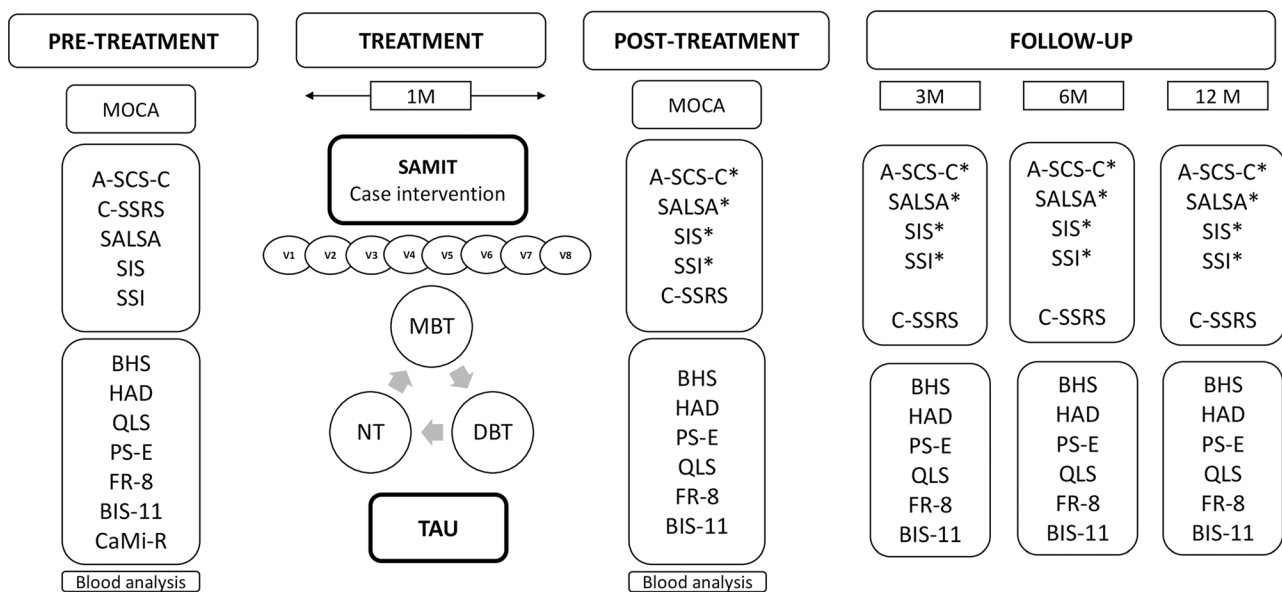
Our study will be carried out by the mental health departments of the two biggest hospitals in the city of Barcelona (Catalonia, Spain): Vall d’Hebron University Hospital (HUVH) and Hospital Clínic (HC) where patients consecutively admitted after an MSSA will be systematically identified in order to invite them to participate in the study.

**Participants**

Potential participants will be identified by clinical psychologists or psychiatrists from the Consultation-Liaison Unit of each hospital. Inclusion criteria will be: being older than 16 years, being hospitalised at HUVH and HC after an MSSA for 24 or more hours, needing specialised care units (including Intensive Care Units (ICU), Hyperbaric Camera Units, Burned Units, Semi-Critical Units), needing specialised surgical treatment, excluding superficial cuts, needing extensive medical treatment and observation (gastric lavage, activated charcoal, observation of neurological tests or other complementary tests), or MSSA with highly lethal methods (precipitation, hanging, firearm, stabbing) needing hospitalisation for 24 or more hours, regardless of the treatment unit. Exclusion criteria will be as follows: patients with suicide attempts who were discharged in <24 h., patients under 16 years, patients with mild to severe cognitive impairment, lack of informed consent, critical ill patients at the moment of the assessment, presence of a psychiatric or neurological disease that prevents therapeutic commitment, and patients who do not speak Catalan, Spanish, or English.

**Randomisation**

A statistician who was not associated with the study investigators will use a random number generator from a Research Electronic Data Capture (REDCap) randomisation software [47] to randomly assign enrollees to either the case intervention group (n=60) or the control group



**MOCA:** Montreal Cognitive Assessment, **A-SCS-C:** Abbreviated Suicidal Crisis Syndrome Checklist, **C-SSRS:** Columbia-Suicide Severity Rating Scale **SALSA:** Scale for assessment of lethality of suicide attempt. **SIS:** Suicide intent Scale, **SSI:** Suicide for suicide ideation, **HADS:** Hospital Anxiety and depression Scale, **BHS:** Beck Hopelessness Scale. **BIS-11** Barratt Impulsiveness Scale. **QLS:** Quality of Life Scale, **PS-E:** Psychache Scale **RFQ-8:** The reflective functioning Questionnaire. **CAMI-R** Short version of CaMir questionnaire. **MBT** Mentalization-based therapy. **DBT:** dialectical behaviour therapy; **N:** narrative therapy. **V1:** Visit 1, **V2:** Visit 2, **V3:** Visit 3, **V4:** Visit 4, **V5:** Visit 5, **V6:** Visit 6, **V7:** Visit 7, **V8:** Visit 8. **1M** 1 month. **3M:** 3 months. **6M:** 6 months, **12M:** 12 months. **SAMIT** Suicide Attempt Multicomponent Intervention Treatment. **TAU** Treatment as usual. \*only will be administered again in case of re-attempt during the treatment and follow-up period.

**Fig. 2** Study protocol

( $n=60$ ) (see Fig. 3). In this single-blind trial, computer-generated randomisation will reveal the intervention group via REDCap to the research psychologist.

In the post-treatment assessment, the patient will receive an automated email via the REDCap platform at the end of the last treatment session with the questionnaires (Post-treatment visit) (see Fig. 2). In case the patient is unable to answer by him/herself, an independent evaluator will assist him/her.

**Blindness**

The initial assessment will be carried out by a study investigator, randomisation will be performed after the baseline assessment to reassure blindness. Post-intervention assessment will be conducted through the online REDCap program in order to maintain the blinded assessment. It will only be done through the evaluator in cases where the patient is unable to complete the tests in an online format. Trained clinicians blind to the intervention group (PhD students, psychologists’ residents, and/or medical doctors), will be trained to carry out the assessment.

**Sample size calculation**

Power calculation is based on the results of previous randomised controlled trials with a comparable design and an expected repetition risk of 30% in the control group and 15% in the treatment group. The required sample

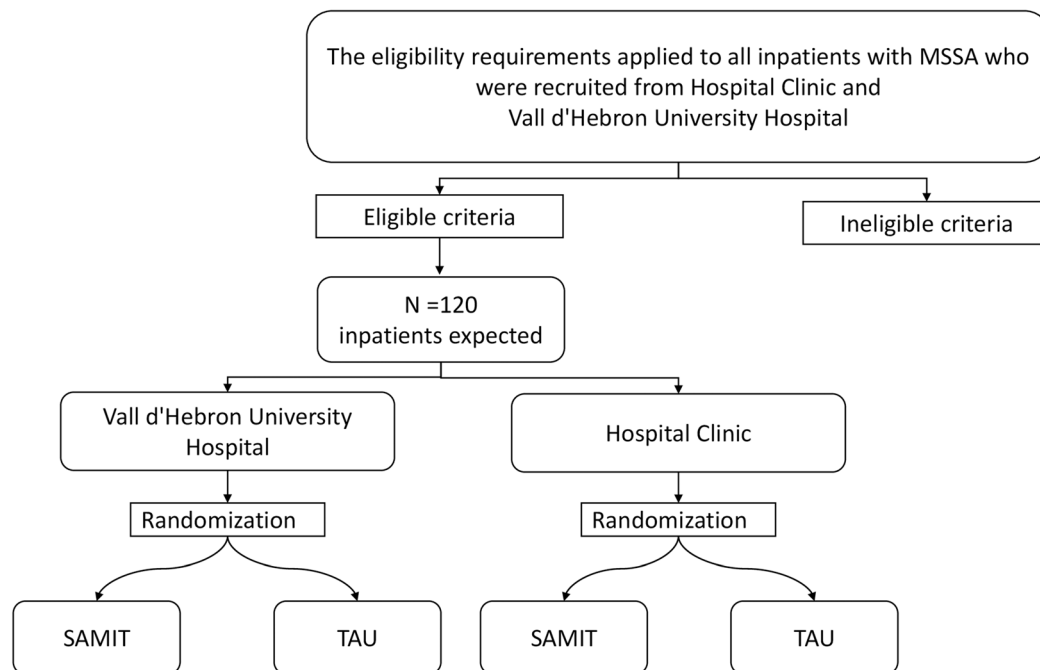
size was calculated to compare the survival curves of the two groups using a Cox proportional hazards model for clinical trials [48]. In order to obtain the desired statistical power of 80% (i.e., to detect a hazard ratio of 0.44 for time to the next suicide attempt in both groups, with a two-sided alpha level of 0.05), it is required to recruit a sample size of 120 subjects.

**Statistical methods**

An initial statistical descriptive analysis (frequencies, central tendency measures, and dispersion measures) of the studied variables will be performed. Comparative analyses will be carried out to evaluate the effectiveness of SAMIT program in the case intervention group and the TAU in the control group.

Depending on the sample data distribution, primary analyses will be performed by means of a parametric ( $t$ -test) or non-parametric (Mann-Whitney) test. Secondary comparisons to estimate changes in the other measurement scales will also be analysed.

The Cox proportional hazards regression model [48] will be conducted to identify recurrent suicide attempt predictors. Before conducting the multivariate analyses, categorical variables will be re-coded into new binary categories when necessary. In this scenario, the variables that in the previous bi-variate step indicated a significant effect will be included as predictors. All hypotheses’ tests will be two-tailed and conducted with an alpha of



RCT-Flow chart. MSSA; Medically Serious Suicide Attempts. SAMIT; Suicide Attempt Multicomponent Intervention Treatment TAU; Treatment as usual.

**Fig. 3** RCT-Flow chart

0.05. The statistical analyses will be carried out using the Statistical Package for the Social Sciences (SPSS) software, version 2.0 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.), for Windows. Before any analyses are performed, a comprehensive statistical analysis strategy will be created and published. The analysis strategy will address missing data and subgroup analysis.

#### Data collection

All patients will complete an ad hoc socio-demographic and bio-medical questionnaire during the baseline assessment. It will include information on age, sex, nationality, civil status, educational level, employment status, family situation, history of child/adolescent/adult trauma or abuse, history of personal medical or surgical conditions, and current medical or surgical conditions and clinical diagnosis according to Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR) [49].

#### Procedure

Subjects meeting the criteria for the study will be identified from the hospital databases by the study researchers. These patients are generally evaluated by a psychiatrist or a clinical psychologist in the Department of Psychiatry of each hospital. Researchers will pre-screen for eligibility and provide informed consent. Only individuals who agree to participate will be evaluated. The researchers will meet the patient during the first week after the MSSA or once their medical/surgical condition allows them to complete the baseline assessment. They will be evaluated in a quiet private location. The study design and characteristics will be explained in detail to both case and control patients before they sign the informed consent. Patients will be randomly assigned to each group. Cases intervention group will enrol the SAMIT program, while subjects in the control group will receive TAU.

The patients will be evaluated prospectively for the first 12 months (Fig. 1) after the end of the treatment program. Longitudinal assessments will be made via email using the REDCap program. REDCap completes security standards, and named users with a database administrator profile can access the data for administrative purposes. In addition, REDCap allows variables to be marked as patient identifiers, so that when generating reports and data export files, the records are de-identified.

Treatment adherence will be monitored by means of supervision and review of audio recorded individual therapy sessions by supervisors. Feedback on treatment adherence is then provided to the clinician by the supervisor. Adherence will be evaluated through the assistance to every psychotherapeutic session. If any session

is missed, we will call the patient, and schedule a new appointment, if needed.

#### Psychotherapeutic intervention

- Case intervention group.

The SAMIT programme consists of eight structured and manualized face-to-face sessions that include MBT, DBT, and narrative therapy techniques (adapted from the ASSIP therapy). The sessions will be conducted by a clinical psychologist with expertise in psychotherapy and a research psychologist specifically trained to apply the treatment (who will be referred as therapists moving forward). Both therapists are trained in MBT [50, 51] following Anna Freud Centre's Quality Manual [50]. There will be two 60-minute sessions per week.

**Session 1** Narrative interview. An interview will be conducted based on the first session from the ASSIP program. Patients will be asked to tell their personal story about how they reached the point of attempting suicide [40]. The therapist should acknowledge the meaning of important life experiences in their biographical context and their relevance for understanding the suicidal crisis. The session will be voice-recorded with the patients' written consent.

**Session 2** MBT psychoeducation and introduction to the MBT model. In this session, the MBT model will be explained: what mentalization is, its main concepts (automatic-controlled, emotions-thoughts, other-self and external-internal), examples of situations, benefits of MBT, mentalization and misunderstandings, the differences between interpretations and actions, and mental manipulation [43].

**Session 3** Emotional regulation from the MBT framework. This session will focus on explaining the mentalization of emotions [43, 50] by distinguishing and describing basic emotions vs. social emotions, empathic validation, importance of the primary emotional state, emotion vs. feeling, mentalizing attitude as openness, and curiosity regarding differences between people, anxiety, and depression as triggers.

**Session 4** Functional analysis of the SA by the MBT. For this purpose, the voice recording will be retrieved and together with the patient work will be done on conceptualisation of suicide and self-harm from a "failure of mentalization" viewpoint [50]. Establish a joint reflection on suicide, self-harm, and violence. Focus on affect depending on the joint reflection: presentation of the shared dilemma. Identify the moment of "loss," the attachment trigger, and the context. Work towards recognition

and awareness of vulnerabilities and representation of context.

**Session 5** Emotional regulation from DBT. This session will focus on the suicide behaviour by identifying the emotions that preceded the suicidal behaviour, and seek more adaptive emotional regulation strategies [52]. The therapist will teach the patient strategies of distress tolerance and emotional regulation.

**Session 6** Attachment and relationships, from MBT. Introduction to attachment styles, types of attachment, the importance of attachment and bonding relationships, and attachment and mentalization [50]. Introduction to the role of this attachment in relationships and in the context of SAs.

**Session 7** Conceptualization of suicide, attachment, and mentalization from MBT. In this session, we will return to the functional analysis [50]. Acknowledge the patient's mental state at the point of vulnerability prior to the conflictive interpersonal event (i.e., when the distress began, when they were still calm and could mentalize to regain a sense of understanding of their inner world, agent sense, with a new reading, now mental, of their behavioural path).

**Session 8** Crisis plan from MBT [53]. Considering the previous sessions, a crisis plan will be developed. The main objectives of this session will be to identify: (1) Warning signs and triggers (i.e., emotions, reactions, interpersonal relationships, events, etc.). (2) Internal coping strategies (i.e., mentalization review and emotional regulation strategies). (3) External coping strategies (i.e., people and social activities that can help to distract the individual, support people, and identification of external resources such as the suicide behaviour hotline (024, 112, 061)).

- TAU intervention group.

Patients assigned to the control group will receive TAU, which could vary from patient to patient and between hospitals, but usually consists of a liaison-consultation clinical assessment, and treatment if it's needed, usually by a psychiatrist, and depending on the centre also by a clinical psychologist, usually within 24–48 h of admission to the hospital. The follow-up program will include a clinical assessment, and an intervention, by mental health services, implemented in inpatient units or outpatient units, depending on the case. Local primary care, as well as mental health, and medical services offer standard care depending on the available resources. Participants in the TAU group will also receive full assessments at baseline, 3, 6, and 12 months.

## Outcome variables

### Main outcome variable

The main outcome variable will be the self-reported re-occurrence of the SA (during the follow-up as well as the period since that event). Information such as the suicide method, lethality/medical damage, severity and questions related to suicide ideation and behaviour will be specifically asked to participants. Moreover, both hospital databases whenever a unified clinical history for patients treated in Catalonia is available, will be checked.

### Secondary outcome variables

Other secondary outcome variables will be related to the changes observed prospectively and variables will be assessed in both groups (see Fig. 1).

**Cognitive screening** Before starting the treatment, the patient will undergo the Montreal Cognitive Assessment (MOCA) [53] to control for cognitive impairment. MOCA will be administered again in the post-treatment phase.

### Suicide behaviour assessment

- **Abbreviated Suicidal Crisis Syndrome Checklist (A-SCS-C)** [54], is an interview with dichotomous responses that assesses conditions linked to imminent suicidal behaviour characterized by (a) affective disturbance, loss of cognitive control, hyperarousal and social withdrawal, and (b) a generalized sense of entrapment in which escape from an intolerable life situation is perceived as both urgent and impossible.
- **The Suicide Attempt Lethality Assessment Scale (SALSA)** [55], consists of two parts: (a) four items indicating seriousness of the attempt and its consequences likelihood; and (b) global impression of lethality. All the items are scored from 1 to 5, higher scores suggest a greater lethality.
- **The Columbia Scale for Assessing the Seriousness of Suicidal Ideation (C-SSRS)** [56], is a semi-structured interview with dichotomous answers that captures the occurrence, severity, and frequency of suicide-related behaviours and thoughts during the assessment period.
- **The Beck Suicidal Intentionality Scale (SIS)** [57], is a semi-structured scale consisting of 20 items, which are rated on a 3-point scale (0 to 2 points). Scores can range from 0 to 38, with higher values indicating a greater risk of suicide.
- **The Scale for Suicide Ideation (SSI)** [58], evaluates the presence and intensity of suicidal thoughts in the week before evaluation. It is composed of 19 items that are scored from 0 to 2, where 0 refers to

moderate/ strong, 1 to weak, and 2 to no suicide ideation.

A-SCS-C [53], SIS [56], SSI [57], SALSA [55] only will be administered again in case of re-attempt during the follow-up period.

#### Psychosocial assessment

**The Quality of Life Scale (QLS)** [59], consists of 21 items that are grouped into the following 4 categories or factors: intrapsychic functions (cognition, and affectivity), interpersonal relationships (interpersonal and social experience), instrumental role (work, study, parental duties), and use of common objects and daily activities. The reference period is the previous four weeks.

#### Psychopathological assessment

Mental health conditions will be assessed before, after treatment, and during the follow-up period (3, 6 and 12 months).

- **The Psychological Pain Scale (PS-E)** [60], evaluates psychological pain as a subjective experience. It is composed of 13 items on a Likert-type scale [1–5]. Higher scores indicate greater psychological pain.
- **The Hospital Anxiety and Depression Scale (HADS)** [61], evaluates states of depression and anxiety in the setting of a hospital outpatient clinic. It consists of 14 items on a 4-point Likert scale (range 0–3) where three denotes the highest level of anxiety or depression. It has seven items for each subscale (anxiety and depression). The sum of the 14 items makes up the overall score.
- **The Beck hopelessness scale (BHS)** [62], is a 20-item test with true-false answers. It evaluates the degree of pessimism, or negative attitudes, regarding the future held by the responder. It could serve as a predictor of suicidal ideation in depressed individuals with a history of attempted suicide. Scores ranging from 0 to 3 as are considered within the normal range, 4 to 8 identify mild hopelessness, scores from 9 to 14 identify it as moderate and scores greater than 14 identify it as severe.
- **The Barrat Impulsiveness Scale (BIS-11)** [63], is a self-report measure with 30 questions about impulsiveness. It includes six first-order factors (attention, motor, self-control, cognitive complexity, perseverance, and cognitive instability impulsiveness) and three second-order factors (attentional, motor, and non-planning impulsiveness). It is rated on a four-point Likert scale from 1 (rarely/never) to 4 (almost always/always). Higher scores reflect higher levels of impulsiveness.

- **The Reflective Functioning Questionnaire (RFQ-8)** [64], is a self-administered questionnaire that consists of 8 items. It provides responses to each item on a seven-point scale between “strongly disagree” and “strongly agree”. The higher the score, the worse the reflective capacity.

#### Attachment

- **Short version of CaMir questionnaire (CaMir-R)** [65] is a self-questionnaire that measures attachment representations. It is based on the subject’s evaluations of past and present attachment experiences and family functioning. It consists of 32 items to be answered by the participant on a 5-point *Likert-type* scale (1 = strongly disagree, 5 = strongly agree). The questionnaire consists of seven dimensions, five of which refer to attachment representations (security: availability and support of attachment figures; family preoccupation; parental interference; self-sufficiency and resentment against parents; and childhood trauma), and the remaining two refer to representations of family structure (value of parental authority and parental permissiveness).

#### Biological assessments

Blood samples will be taken pre- and post-treatment at each study centre and at the same day as clinical assessments take place. This will be done by an experienced nurse between 7.00 and 10.00 a.m. under fasting conditions.

#### Immune/inflammatory parameters

The following immune/inflammatory parameters will be measured by an automatized analyser, following the manufacturer’s protocols: complete and differential white blood cell (WBC) counts and percentages (i.e., total leukocytes (normal range:  $4.0-1.00 \times 10^9/L$ ), neutrophils (normal range: counts:  $2.0-7.0 \times 10^9/L$ /percentage: 40.0–80), lymphocytes (normal range: counts:  $1.2-3.5 \times 10^9/L$ /percentage: 20.0–50), monocytes (normal range: counts:  $0.1-1.0 \times 10^9/L$ /percentage: 2.0–11.0), eosinophils (normal range: counts:  $0.0-0.5 \times 10^9/L$ /percentage: 0.0–5.0), and basophils (normal range: counts:  $0.0-0.2 \times 10^9/L$ /percentage: 0.0–2.0), acute-phase reactants (i.e., high-sensitivity C-reactive protein (hsCRP); normal range: <10 mg/L), pro-inflammatory cytokines (i.e., IL-6; normal range: <8 mg/L), lipid profile (i.e., cholesterol; normal range: <200 mg/dL, LDL; normal range: <116 mg/dL, HDL; normal range: >40 mg/dL (men); >50 mg/dL, VLDL; triglycerides; normal range: <150 mg/dL).

### Tryptophan catabolism parameters

In addition, serum and/or plasma will be separated by centrifugation, aliquot, and immediately stored at 80°C until the time of analysis of the following metabolites: Tryptophan and Kynurenine pathway metabolites (i.e., tryptophan (TRP), Serotonin (5-HT), Kynurenine (KYN) Kynurenic acid (KYNA), Xanthurenic acid (XA), 3-Hydroxykynurenine (3-HK), 3-Hydroxyanthranilic acid (3-HAA), Quinolinic acid (QUIN) and, Picolinic acid (PIC) by LCMS/ MS.

### Monitoring

Data monitoring: interim analysis will be carried out during the study, after 6–9 months of starting the recruitment process. The clinical researcher's team involved in the clinical trial, and the sponsor (La Marató de TV3 Foundation) of the study, will have access to the interim analysis.

### Adverse events

Therapists will be aware of the symptomatology that can be reactivated or intensified through psychotherapy sessions, related to trauma experiences, suicide thoughts, or past suicide attempts. For this reason, these symptoms will be monitored, asking about behavioural changes, suicide ideation, pharmacologist and medical treatments ongoing, experienced difficulties expressed by participants, and if needed, action will be taken. In case of worsening during the treatment phase, we will refer the patient to the emergency room, or we'll coordinate with outpatient mental health units if needed.

### Discussion

This will be the first study to propose an early psychotherapeutic intervention program for patients with MSSA in order to prevent other attempts in the future. The proposed intervention, SAMIT program, is a combination of therapies (MBT, DBT, and narrative therapy) that have been demonstrated to be useful for treating mental disorders in which suicidal behaviour is highly present. This research does not focus on any mental disorder, it's a transdiagnostic intervention, and do focus on treating the suicidal behaviour. This means that individuals without any known or previous mental disorder presenting with a MSSA may be included in the study. Our aim is to provide patients with strategies to improve their mental capacity and emotional self-regulation, in order to reduce their hopelessness, psychological pain and impulsive traits, and to increasingly improve their self-reflection, psychological strategies, emotional regulation and overall quality of life.

At the same time, the study will assess pre- and post-treatment biological (inflammatory markers or tryptophan metabolism) and psychosocial variables, which will

shed light on the mechanisms underlying the effects of psychotherapy in MSSA patients. The study will also take into account gender and sex variables in the analysis of outcomes in relation to treatment efficacy, mental health and biological variables.

### Abbreviations

MSSA	Medically Serious Suicide Attempts
SA	Suicide Attempts
ICU	Intensive Care Unit
CSF	Cerebrospinal fluid
KYN	Kynurenine
QUIN	Quinolinic acid
TRP	Tryptophan
5-HT	Serotonin
KYNA	Kynurenic acid
XA	Xanthurenic acid
3-HK	3-Hydroxykynurenine 3
3-HAA	Hydroxyanthranilic acid
PIC	Picolinic acid
HUVH	Vall d'Hebron Hospital Universitari
HC	Hospital Clínic
DSM-V-TR	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision

### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12888-024-06113-3>.

Supplementary Material 1

Supplementary Material 2

Supplementary Material 3

### Acknowledgements

The authors wish to thank all the researchers for their kind collaboration, and La Marató de TV3 Foundation (202208-30-31 funds) for the funding and support. We also appreciate the support received from the Consultation-Liaison Psychiatry Unit from both hospitals (HUVH and HC), a special mention to Mercè Cámara, Pilar Lusilla, Sonsoles Cepeda, Miguel Sandois, Eva Baillés, Miquel Ferré, Marta Rimblas, Andrea Santoro, Mar Baz, José.A. Navarro, and Gemma Español. Also, want to thank the technical support received by Raquel Ibarz from the Biomedical Network Research Center on Mental Health (HUVH), Lluís Montesinos from the Spinal Cord Injury Unit (HUVH), and Anna Sanjuan and Santiago Pérez from the Statistics and Bioinformatics Unit (UEB) Vall d'Hebron Research Institute (VHIR). In addition, thanks to Hugo López and the Health and Addictions Research Group (Grup de Recerca Emergent, 2021 SGR 01158, AGAUR).

### Author contributions

A.B. and M.D.B. performed the protocol. L.P, P.B, M.D.B., M.Q.F., A.M.A., and A.B. reached clinical consensus to select the final sample in view of the inclusion/exclusion criteria. A.M.A. and A.B. wrote the first draft of the manuscript. O.S.E., M.Q.F., G.A.H., G.P.P., P.S.C., G.I., P.I., L.P, P.B., J.A.R.Q., and M.D.B. contributed to the design of the study, participated in the consensus process, and critically revised the manuscript. All authors contributed to and approved the final manuscript.

### Funding

The panel of La Marató de TV3 Foundation, a non-profit association from Catalonia (Spain), which funded the project (202208-30-31 funds), has peer reviewed the study protocol as part of the funding process. Funding bodies will not be involved in any part of the design, conduct, analysis, interpretation, and reporting of this trial.

### Data availability

No datasets were generated or analysed during the current study.

## Declarations

### Ethics approval and consent to participate

The protocol was approved by the Vall d'Hebron University Hospital Ethical Research Committee PR(AG)463/2022 and Hospital Clinic Ethical Committee HCB/2022/0279. All methods were carried out in accordance with applicable guidelines and regulations.

The study protocol is also registered in the Clinical Trials Registry (Trial Registration) at ClinicalTrials.gov with the identifier ID: NCT06238414. Date of registration: 1st February 2024, final update is protocol version 3.0, 19th March 2024.

Any protocol amendment that implies a protocol modification will be communicated to the investigators, institutes of research involved (VHIR and IDIBAPS), ethics committees, and the sponsor (La Marató de TV3 Foundation).

### Consent for publication

Not applicable.

### Trial status

We are currently recruiting participants for the trial.

### Dissemination policy

The results will be written up in manuscripts. Additionally, the findings will be presented in platforms for discussion such as national and international conferences or seminars.

### Competing interests

J.A.R.Q was on the speakers' bureau and/or has acted as a consultant for Biogen, Idorsia, Janssen-Cilag, Novartis, Takeda, Bial, Sinrolab, Neuraxpharm, Novartis, BMS, Medice, Rubió, Uriach, Technofarma and Raffo in the last 3 years. He also received travel grants (air tickets + hotel) to attend psychiatric meetings held by Idorsia, Janssen-Cilag, Rubió, Takeda, Bial and Medice. The Department of Psychiatry that he chairs has received unrestricted educational and research support from the following companies in the last 3 years: Exeltis, Idorsia, Janssen-Cilag, Neuraxpharm, Oryzon, Roche, Probitas, Psiou, and Rubió.

### Author details

<sup>1</sup>Department of Mental Health, Vall d'Hebron Hospital Universitari, Vall d'Hebron Barcelona Hospital Campus, Barcelona, Catalonia, Spain

<sup>2</sup>Mental Health and Addictions Group, Vall d'Hebron Research Institute (VHIR), Barcelona, Catalonia, Spain

<sup>3</sup>Mood Disorders Program, Foothills Medical Center, Calgary, AB, Canada

<sup>4</sup>Biomedical Network Research Centre on Mental Health (CIBERSAM), Barcelona, Catalonia, Spain

<sup>5</sup>Department of Psychiatry and Forensic Medicine, Universitat Autònoma de Barcelona, Barcelona, Catalonia, Spain

<sup>6</sup>Psychiatry and Mental Health Department, October 12th University Hospital, Madrid, Spain

<sup>7</sup>Spanish Society of Therapy Based on Mentalization, Barcelona, Spain

<sup>8</sup>Department of Psychiatry, Carl Icahn School of Medicine at Mount Sinai, New York, NY, USA

<sup>9</sup>Consultation-Liaison Psychiatry Unit, Institute of Neurosciences, Hospital Clinic, University of Barcelona, IDIBAPS, Barcelona, Spain

<sup>10</sup>Addictive Behaviors Unit, Psychiatry Department, Institute of Neurosciences, IDIBAPS. RIAPAD (Red de investigación de atención primaria en adicciones), Hospital Clínic, Health and Addictions Research Group, Barcelona, Spain

<sup>11</sup>School of Medicine, Universitat Internacional de Catalunya, Barcelona, Catalonia, Spain

Received: 7 June 2024 / Accepted: 24 September 2024

Published online: 08 October 2024

## References

- World Health Organization. Suicide worldwide in 2019: Global Health Estimates [Internet]. World Health Organization, Geneva. 2019. 4–9 p. <https://apps.who.int/iris/rest/bitstreams/1350975/retrieve>
- Cerel J, Jordan JR, Duberstein PR. The impact of suicide on the family. *Crisis*. 2008;29(1):38–44.
- Pitman A, Osborn D, King M, Erlangsen A. Effects of suicide bereavement on mental health and suicide risk. *Lancet Psychiatry*. 2014;1(1):86–94.
- Chu C, Buchman-Schmitt JM, Stanley IH, Hom MA, Tucker RP, Hagan CR, et al. The interpersonal theory of suicide: a systematic review and meta-analysis of a decade of cross-national research. *Psychol Bull*. 2017;143(12):1313–45.
- INE. Defunciones según la Causa De Muerte. *Notas De Prensa*. 2021;2021:19.
- Intituto Nacional de Estadística. Defunciones según la causa de muerte - año 2022 (datos provisionales). 2023;2022:1–6. [https://www.ine.es/ss/Satellite?L=0&c=INECifrasINE\\_C&cid=1259954008107&p=1254735116567&pagename=Pr](https://www.ine.es/ss/Satellite?L=0&c=INECifrasINE_C&cid=1259954008107&p=1254735116567&pagename=Pr)
- Beneria A, Marte L, Quesada-Franco M, García-González S, Restoy D, Pérez-Galbarro C, et al. Trends in medically serious suicide attempts before and after the COVID-19: a four-year retrospective analysis [Preprint]. 2018–2022 [cited 2023 July 19] (Version 1). Available from: <https://doi.org/10.21203/rs.3.rs-3093002/v1>
- Kawohl W, Nordt C. COVID-19, unemployment, and suicide. *The Lancet*. Volume 7. *Psychiatry*. England; 2020. pp. 389–90.
- Rogers SL, Cruickshank T. Change in mental health, physical health, and social relationships during highly restrictive lockdown in the COVID-19 pandemic: evidence from Australia. *PeerJ*. 2021;9:e11767.
- Beautrais AL. Further suicidal behavior among medically serious suicide attempters. *Suicide Life Threat Behav*. 2004;34(1):1–11.
- Beautrais AL, Joyce PR, Mulder RT. Risk factors for serious suicide attempts among youths aged 13 through 24 years. *J Am Acad Child Adolesc Psychiatry*. 1996;35(9):1174–82.
- Beautrais AL. Suicides and serious suicide attempts: two populations or one? *Psychol Med*. 2001;31(5):837–45.
- Beautrais AL. Suicide and serious suicide attempts in youth: a multiple-group comparison study. *Am J Psychiatry*. 2003;160(6):1093–9.
- Quesada-Franco M, Pintor-Pérez L, Daigne C, Baca-García E, Ramos-Quiroga JA, Braquehais MD. Medically serious suicide attempts in Personality disorders. *J Clin Med*. 2021;10:18.
- Luoma JB, Martin CE, Pearson JL. Contact with mental health and primary care providers before suicide: a review of the evidence. *Am J Psychiatry*. 2002;159(6):909–16.
- Owens C, Booth N, Briscoe M, Lawrence C, Lloyd K. Suicide outside the care of mental health services: a case-controlled psychological autopsy study. *Crisis*. 2003;24(3):113–21.
- Hamdi E, Price S, Qassem T, Amin Y, Jones D. Suicides not in contact with mental health services: Risk indicators and determinants of referral. *J Ment Heal [Internet]*. 2008;17(4):398–409. <https://doi.org/10.1080/09638230701506234>
- Cleary A. Suicidal action, emotional expression, and the performance of masculinities. *Soc Sci Med*. 2012;74(4):498–505.
- O'Brien R, Hunt K, Hart G. 'It's caveman stuff, but that is to a certain extent how guys still operate': men's accounts of masculinity and help seeking. *Soc Sci Med [Internet]*. 2005;61(3):503–16. <https://www.sciencedirect.com/science/article/pii/S0277953605000031>
- Van Orden KA, Witte TK, Cukrowicz KC, Braithwaite SR, Selby EA, Joiner TEJ. The interpersonal theory of suicide. *Psychol Rev*. 2010;117(2):575–600.
- Joiner TEJ, Brown JS, Wingate LR. The psychology and neurobiology of suicidal behavior. *Annu Rev Psychol*. 2005;56:287–314.
- Galynker I, Yaseen ZS, Cohen A, Benhamou O, Hawes M, Briggs J. Prediction of suicidal behavior in high risk psychiatric patients using an assessment of acute suicidal state: the suicide crisis inventory. *Depress Anxiety*. 2017;34(2):147–58.
- Cohen L, Mokhtar R, Richards J, Hernandez M, Bloch-Elkouby S, Galynker I. The Narrative-Crisis Model of suicide and its prediction of near-term suicide risk. *Suicide Life-Threatening Behav*. 2021;52.
- Gilbert P, Gilbert J. Entrapment and arrested fight and flight in depression: an exploration using focus groups. *Psychol Psychother*. 2003;76(Pt 2):173–88.
- Li S, Galynker II, Briggs J, Duffy M, Frechette-Hagan A, Kim HJ, et al. Attachment style and suicide behaviors in high risk psychiatric inpatients following hospital discharge: the mediating role of entrapment. *Psychiatry Res*. 2017;257:309–14.
- Capuzzi E, Caldiroli A, Capellazzi M, Tagliabue I, Buoli M, Clerici M. Biomarkers of suicidal behaviors: a comprehensive critical review. *Adv Clin Chem*. 2020;96:179–216.
- Mann JJ. Neurobiology of suicidal behaviour. *Nat Rev Neurosci [Internet]*. 2003;4(10):819–28. <https://doi.org/10.1038/nrn1220>
- Mann JJ. The serotonergic system in mood disorders and suicidal behaviour. *Philos Trans R Soc Lond Ser B Biol Sci*. 2013;368(1615):20120537.

29. Boulougouris V, Malogiannis I, Lockwood G, Zervas I, Di Giovanni G. Serotonergic modulation of suicidal behaviour: integrating preclinical data with clinical practice and psychotherapy. *Exp Brain Res*. 2013;230(4):605–24.
30. Fernández-Sevillano J, González-Pinto A, Rodríguez-Revuelta J, Alberich S, González-Blanco L, Zorrilla I, et al. Suicidal behaviour and cognition: a systematic review with special focus on prefrontal deficits. *J Affect Disord*. 2021;278:488–96.
31. Fernández-Sevillano J, Alberich S, Zorrilla I, González-Ortega I, López MP, Pérez V, et al. Cognition in recent suicide attempts: altered executive function. *Front Psychiatry*. 2021;12:701140.
32. Fernández-Sevillano J, González-Ortega I, MacDowell K, Zorrilla I, López MP, Courtet P, et al. Inflammation biomarkers in suicide attempts and their relation to abuse, global functioning and cognition. *World J Biol Psychiatry off J World Fed Soc Biol Psychiatry*. 2022;23(4):307–17.
33. Schiweck C, Valles-Colomer M, Arolt V, Müller N, Raes J, Wijkhuijs A, et al. Depression and suicidality: a link to premature T helper cell aging and increased Th17 cells. *Brain Behav Immun*. 2020;87:603–9.
34. Lindqvist D, Janelidze S, Erhardt S, Träskman-Bendz L, Engström G, Brundin L. CSF biomarkers in suicide attempters—a principal component analysis. *Acta Psychiatr Scand*. 2011;124(1):52–61.
35. Sublette ME, Galfalvy HC, Fuchs D, Lapidus M, Grunebaum MF, Oquendo MA, et al. Plasma kynurenine levels are elevated in suicide attempters with major depressive disorder. *Brain Behav Immun*. 2011;25(6):1272–8.
36. Bryleva EY, Brundin L. Kynurenine pathway metabolites and suicidality. *Neuropharmacology*. 2017;112(Pt B):324–30.
37. Linehan MM, Korslund KE, Harned MS, Gallop RJ, Lungu A, Neacsu AD, et al. Dialectical behavior therapy for high suicide risk in individuals with borderline personality disorder: a randomized clinical trial and component analysis. *JAMA Psychiatry*. 2015;72(5):475–82.
38. Yang X, Liu D, Wang Y, Chen Y, Chen W, Yang C, et al. Effectiveness of Zhong-Yong thinking based dialectical behavior therapy group skills training versus supportive group therapy for lowering suicidal risks in Chinese young adults: a randomized controlled trial with a 6-month follow-up. *Brain Behav*. 2020;10(6):e01621.
39. Bryan CJ, Rozek DC. Suicide prevention in the military: a mechanistic perspective. *Curr Opin Psychol*. 2018;22:27–32.
40. Conner KR, Kearns JC, Esposito EC, Pizzarello E, Wiegand TJ, Britton PC, et al. Pilot RCT of the Attempted Suicide Short Intervention Program (ASSIP) adapted for rapid delivery during hospitalization to adult suicide attempt patients with substance use problems. *Gen Hosp Psychiatry*. 2021;72:66–72.
41. Gysin-Maillart A, Schwab S, Soravia L, Megert M, Michel K. A novel brief therapy for patients who attempt suicide: a 24-months Follow-Up Randomized Controlled Study of the Attempted Suicide Short Intervention Program (ASSIP). *PLoS Med*. 2016;13(3):e1001968.
42. Rossouw TI, Fonagy P. Mentalization-based treatment for self-harm in adolescents: a randomized controlled trial. *J Am Acad Child Adolesc Psychiatry*. 2012;51(12):1304–e13133.
43. Griffiths H, Duffy F, Duffy L, Brown S, Hockaday H, Eliasson E, et al. Efficacy of Mentalization-based group therapy for adolescents: the results of a pilot randomised controlled trial. *BMC Psychiatry*. 2019;19(1):167.
44. Bateman A, Fonagy P. Mentalization based treatment for borderline personality disorder. *World Psychiatry*. 2010;9(1):11–5.
45. Riblet NB, Shiner B, Schnurr P, Bruce ML, Wasserman D, Cornelius S, et al. A pilot study of an intervention to prevent suicide after Psychiatric hospitalization. *J Nerv Ment Dis*. 2019;207(12):1031–8.
46. Chan A-W, Tetzlaff JM, Gøtzsche PC, Altman DG, Mann H, Berlin J, Dickersin K, Hróbjartsson A, Schulz KF, Parulekar WR, Krleža-Jerić K, Laupacis A, Moher D. SPIRIT 2013 explanation and elaboration: Guidance for protocols of clinical trials. *BMJ*. 2013;346:e7586.
47. Harris PA, Taylor R, Minor BL, Elliott V, Fernandez M, O'Neal L, et al. The REDCap consortium: building an international community of software platform partners. *J Biomed Inf*. 2019;95:103208.
48. Cox DR. Regression models and life-tables. *J R Stat Soc Ser B*. 1972;34(2):187–202.
49. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, text revision. Washington, DC: American Psychiatric Association; 2022.
50. Bateman A, Fonagy P. Grupo introducción a la MBT (MBT-I). In: Bateman A, Fonagy P, editors. Tratamiento basado en la mentalización para Los trastornos de personalidad. Una guía práctica. 2nd ed. UK. Desclée de Brouwer; 2016. pp. 417–87.
51. Bateman A, Fonagy P. Mentalization-Based Treatment for Personality Disorders: A Practical Guide [Internet]. Oxford University Press; 2016. <https://doi.org/10.1093/med:psych/9780199680375.001.0001>
52. Linehan M. Skills Training Manual for Treating Borderline Personality Disorder, First Ed [Internet]. Guilford Publications; 1993. (Diagnosis and Treatment of Mental Disorders). <https://books.google.es/books?id=iCM6BAAQBAJ>
53. Mentalizing and Emergency Care. In pp. 364–87. <https://www.cambridge.org/core/product/68976C284C388CD60B7A026A9398ED59>
54. Karsen E, Cohen LJ, White B, De GP, Goncarenco I, Galynker II et al. Impact of the abbreviated suicide Crisis Syndrome Checklist on clinical decision making in the Emergency Department. *J Clin Psychiatry*. 2023;84(3).
55. Kar N, Arun M, Mohanty MK, Bastia BK. Scale for assessment of lethality of suicide attempt. *Indian J Psychiatry*. 2014;56(4):337–43.
56. Posner K, Brown GK, Stanley B, Brent DA, Yershova KV, Oquendo MA, et al. The Columbia-suicide severity rating scale: initial validity and internal consistency findings from three multisite studies with adolescents and adults. *Am J Psychiatry*. 2011;168(12):1266–77.
57. Beck RW, Morris JB, Beck AT. Cross-validation of the suicidal intent scale. *Psychol Rep*. 1974;34(2):445–6.
58. Beck AT, Steer RA, Ranieri WF. Scale for suicide ideation: psychometric properties of a self-report version. *J Clin Psychol*. 1988;44(4):499–505.
59. Burckhardt CS, Anderson KL, Archenholtz B, Hägg O. The flanagan quality of life scale: evidence of construct validity. *Health Qual Life Outcomes*. 2003;1(59):1–7. <https://doi.org/10.1186/1477-7525-1-59>.
60. Shneidman ES. The psychological pain assessment scale. *Suicide Life Threat Behav*. 1999;29(4):287–94.
61. Zigmund AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand*. 1983;67(6):361–70.
62. Beck AT, Weissman A, Lester D, Trexler L. The measurement of pessimism: the hopelessness scale. *J Consult Clin Psychol*. 1974;42(6):861–5.
63. Patton JH, Stanford MS, Barratt ES. Factor structure of the Barratt impulsiveness scale. *J Clin Psychol*. 1995;51(6):768–74.
64. Ruiz-Parra E, Manzano-García G, Mediavilla R, Rodríguez-Vega B, Lahera G, Moreno-Pérez AI, et al. The Spanish version of the reflective functioning questionnaire: validity data in the general population and individuals with personality disorders. *PLoS ONE*. 2023;18(4):e0274378.
65. Balluerka N, Lacasa F, Gorostiaga A, Muela A, Pierrehumbert B. Versión reducida del cuestionario CaMir (CaMir-R) para la evaluación del apego. *Psicothema*. 2011;23(3):486–94.

## Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.