Research paper

Unified protocol for anxiety disorders in two cities of Mexico measuring gamma activity: Study protocol for a randomized controlled trial

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A B S T R A C T

Background: The Unified Protocol for Emotional Disorders (UP) for emotional regulation manifests effective results in a broad range of mental disorders. The UP efficacy was tested in several countries, but it has not been tested within Mexican population. It is crucial to do more research and implement effective protocols to intervene Mexican population with Anxiety Disorders (AD).
Objective: This study aims to examine and describe the research procedures and treatment interventions of the UP in a Randomized Controlled Trial (RCT), to approach and treat AD in patients in 2 Mexican borderland cities, by applying the UP and an Electroencephalogram (EGG) neuro screening.
Methods: The enrolled patients will be randomized in a two-arm control trial with repeated measures, comprising between 18 and 60 years, that were diagnosed with an AD, and low scored in depression symptoms and suicidal ideation. The study will comprise of two conditions: an intervention group clinical trial with the UP or a waiting list control. The primary outcome measures will be applied on AD quantitative self-reports and a gamma activity by EGG before and after the intervention and in follow-ups of 3 and 6 months. The participants in the waiting list group, will receive the treatment after the trial first group completes the treatment.
Conclusions: Processes and outcomes of this project, will provide evidence in order to apply the UP in a broader population with AD and other mental disorders also covered by this protocol, such as depression and borderline personality disorder in a broader Mexican population, a country that suffers with a major health issue with an increasing rate of mental disorders and scarce psychological and health coverage.

1. Introduction

Anxiety Disorders (AD), have the highest prevalence worldwide, 24.6 million individuals registered on 2015 [1]. According to the World Health Organization (WHO), the AD includes Generalized Anxiety Disorder (GAD), panic disorder, phobias, social anxiety disorder obsessive-compulsive disorder and post-traumatic stress disorder [1]. In the last version of the Diagnostic and Statistical Manual of Mental Disorders version 5 (DSM-5), were removed the obsessive-compulsive disorder, and post-traumatic stress disorder from anxiety disorders, however anxiety symptoms are common in both disorders [2].

According to the Mexican Office of Scientific and Technological Information 18% of the population in México aged 18–64 suffers a mood disorder, such as: anxiety, depression or phobia and only half of the Mexican population receives an adequate treatment [3].

1.1. Unified protocol for anxiety disorders

Cognitive Behavioral Therapy (CBT) is the main evidence-based psychological approach for AD that has the most available amount of evidence regarding its efficacy [4]. The Clinical effectivity of CBT is widely recognized; the disadvantage is that this approach is less efficient in comorbid diagnoses [5]. The transdiagnostic treatments is an

Abbreviations

AD	Anxiety Disorders
ADIS-IV	Anxiety Disorders Interview Schedule
BDI-II	Beck Depression Inventory–II
CBT	Cognitive Behavioral Therapy
CRES-4	Consumer Reports Effectiveness Scale
DSM-5	Diagnostic and Statistical Manual of Mental Disorders version 5
EEG	Electroencephalography
GAD	Generalized Anxiety Disorder
GAD-7	Generalized Anxiety Disorder 7-item scale
OASIS	Overall Anxiety Severity and Impairment Scale
ODSIS	Overall Depression Severity and Impairment Scale
PDS	Posttraumatic Diagnostic Scale
SPSS	Statistical Package for Social Sciences
RCT	Randomized Controlled Trial
STAI	State-Trait Anxiety Inventory
UP	Unified Protocol for Emotional Disorders
WHO	World Health Organization
Y-BOCS	Yale-Brown Obsessive-Compulsive Scale

innovative approach for a broad range of emotional disorders. The unified or transdiagnostic treatments applies the same principles across mental disorders without tailoring the protocol to specific diagnoses: "Emphasis is on functional links (thoughts, behaviors, physiology, and emotions), increasing flexibility to identify cognitions contributing to different cues (interoceptive cues, social interactions), as well as, emotional responses (depression, anxiety, anger)" (p.24) [6]. Emotional regulation and physiological adjustments increase repeated challenges during stressful situations engaged in divergent cognitive evaluations. The Unified Protocol for Emotional Disorders (UP) developed by David Barlow et al. combines intervention elements, such as: cognitive reappraisal and exposure, into a series of coordinated modules to target psychological mechanisms that maintain negative effect across disorders [7]. The UP has already been implemented in different studies worldwide. Sakiris & Berle provided a meta-analysis evaluating the effectiveness of the UP of 15 studies with 1244 participants, demonstrating reductions across AD with large effect sizes (g > 0.8) [5]. In Latin America, de Ornelas Maia, Braga, Nunes, Nardi & Silva applied and evaluated in Brazil the UP on patients with comorbid mood and AD, reaching high size effects on quality of life, sexuality, and anxiety/depression symptoms [8]. Also, de Ornelas, Nardi & Cardoso, achieved a high significance results by applying the UP that resulted on an evident emotional stabilization and socialization in a Brazilian sample diagnosed with anxiety and depression disorders [9].

1.2. Electroencephalogram application in anxiety disorders

On the other hand, the Electroencephalogram (EEG) has been found useful with functional exploration techniques of the central nervous system measuring electrophysiological activity and analyzing the brain waves across different pathologies [10,11]. In patients with Major Depressive Disorder, it was observed that the beta waves, which oscillate between 12 and 30 Hz, and low gamma waves between 30 and 50 Hz, showed significant negative correlations with an applied scale of 9 items that measure inattention scores [12]. An EGG reliability diagnostic measured electrocortical activity in social anxiety patients in two different instances with one week difference, briefly, the task consisted in providing a speech during 3 min on controversial topics that were relevant to the context of the country they live in; (e.g., capital punishment), in front of two female observers and recorded by a video camera. The topic was different in the two scenarios, the results showed

excellent test-retest reliability regarding measures of alpha power and resting frontal EEG asymmetry [13]. In a study with patients suffering from GAD, were submitted to a worry induction task, observing an increment in the gamma activity, and in a relaxation phase a reduction of the same wave [14]. Also, there is available evidence in patients with social anxiety disorder that were measured with EEG before and after receiving 12 sessions of standardized group CBT, observing that previous to the intervention, there was a greater recording relative to the right frontal EEG activity after the intervention. Also, it was observed greater relative left frontal brain activity, and this was also correlated with higher success in psychological interventions [15].

These results are in accordance with the study of Mathersul et al. where it was found left frontal lateralization in healthy participants, greater right frontal lateralization in anxious participants and symmetrical frontal activity in depressed and comorbid (anxiety and depression) participants [16]. Despite the vast evidence of the use of EEG to measure the brain activity in the patients to predict the effectiveness of psychological interventions, and also to measure the changes after receiving such interventions, this tool is usually not applied in Mexico [17].

The purpose of this article is to examine and describe the research procedures and treatment intervention for a protocol of a Randomized Controlled Trial (RCT) to treat AD. The intervention plan is to take place in the two biggest borderland cities in Mexico: Tijuana and Juarez, both cities sharing high direct and indirect exposure to extreme social violence [18,19]. Treatment effectiveness will be analyzed by self-report psychometric, Cohen's effect size *d* estimate and corroborated by EGG.

1.3. Study specific aims

The aims of the study are: (1) To examine the acceptability of research procedures and treatment interventions for the UP for the treatment of AD in a sample of the population requesting psychological treatment in mental health centers of Tijuana and Juarez. (2) Describe how the methods will be performed, as the treatment will be delivered face-to-face, (3) how the efficacy of the UP will be tested: Primary endpoint is self-report psychometric results that will be estimated by Cohen's effect size *d* and activity in the gamma rhythm.

2. Methods

2.1. Study design and aims

An experimental test-post-test with control and an experimental group RCT will be carried out in Tijuana and Juarez. Exactly the same conditions and procedures will be performed in both cities. Participants will be randomly assigned to experimental or control condition. The experimental group will receive psychological treatment through the UP and the control group will be on the waiting list. After the time period of the treatment has finished, the participants in this group will receive the treatment. This will be a single-blinded study. The primary outcomes will be pre and post testing, and the follow-up assessments at 3 and at 6 months. The secondary outcomes will be self-reported symptoms of Anxiety and Depression during each session of the treatment. It is hypothesized that the UP will be efficacious through the different AD disorders in the population manifested in reductions in comorbid disorder severity [20]. Also it is expected that the gamma rhythm will be lower in the patients after the UP intervention, compared with the control group. Finally, also it is hypothesized that this reductions will be maintained in the follow-up assessments. With this design it will be possible to obtain enough data to accept or reject the established hypothesis. The participants will not receive any payment for their collaboration in this study; however, the entire treatment that they will receive will be complimentary..

2.2. Procedures

2.2.1. Participant selection, recruitment, retention

Advertising will be created for the distribution of project information. Such advertising will be located in strategic places located in both cities, such as community centers, schools, and shopping centers, as well as the Autonomous University of Baja California, Tijuana Campus and the Autonomous University of Ciudad Juarez. In addition, this advertising will be distributed through digital media. Participants will be informed that this treatment will be free of charge and aimed at people with a diagnosis of AD. During the recruitment phase, the existence of the project will be made public through posters in order to attract potential candidates to participate. Once potential participants have applied for the project, the battery of psychometric tests will be applied, as well as an specialized interview to determine the existence and severity of symptoms of AD. Those individuals who clearly present symptoms of one or more of the AD,will be additionally measured with an EEG device and also will be included in the study (see Fig. 1).

2.2.2. Study settings

The first setting of the study will be in Juarez, a city that is located approximately 231 miles from Chihuahua state capital city, Chihuahua City, and 970 miles northwest from Mexico City. This borderland region remains an important gateway for migration, trade, and services. A migration based population that has cultural and economic disadvantages, and conversely a lack of understanding about the borderlands crisis. Juarez has a population of 1.32 million people [17], and since the Mexican Drug Crisis in 2008, Juarez habitants has been directly and indirectly exposed to high quantitative and qualitative violent scenarios. Juarez is the second major borderland metropolitan area in the Mexico – U.S. border city [19].

The second study setting is considered the first major metropolitan borderland area, Tijuana City, which is located on the border shared with San Diego, California; it has a population of 1.30 million people. During last decade, Tijuana has suffered as Juarez City did, as a main hot spot for rival drug dealer wars [21].

2.2.2.1. Interventional settings.

1) The Psychology laboratory of the Faculty of Medicine and Psychology of the Autonomous University of Baja California, in Tijuana. The laboratory is equipped and isolated of external noise with full privacy consulting rooms, where several patients living in Tijuana from all socioeconomic levels receive psychological treatment at low cost (50 pesos that is equivalent to approximately 2.5 U.S. dollars) or in some specific cases the treatment is totally free.

2) Institute of Social Sciences and Administration of the Autonomous University of Juarez. The institute also has consulting rooms with similar characteristics to the aforementioned location, and the general community of Juarez can attend the Psychological Care Center named SURÉ, which provides treatment to university students and general population for the same price as location 1.

2.2.3. Inclusion and exclusion criteria

The participants must fulfill all the following inclusion criteria and to not meet in any of the exclusion criteria.

2.2.3.1. Inclusion criteria.

1. The participants must be residents of Tijuana or Juarez.

2. Man or woman aged 18–60 years, diagnosed in the clinical interview with a generalized anxiety disorder and/or agoraphobia with or without panic attacks and/or posttraumatic stress disorder and/or obsessive-compulsive disorder and/or social anxiety disorder and/or specific phobias.

3. Those participants who have been diagnosed by the clinicians on the self-reported scales one of the previous anxiety disorders, with low scores in depression and suicidal ideation considering a cutoff <11 in the ODSIS (Overall Depression Severity and Impairment Scale), will be considered as study participants. Using the traditional threshold approach, the optimal cut-off score from the perspective of the balance of sensitivity and specificity for a high level of depression score was 11 or higher [22].

4. Gives full informed consent to participate in the study.

2.2.3.2. Exclusion criteria.

1. Any participant who is currently using drugs.

2. Participants currently in psychological and/or pharmacological treatment.
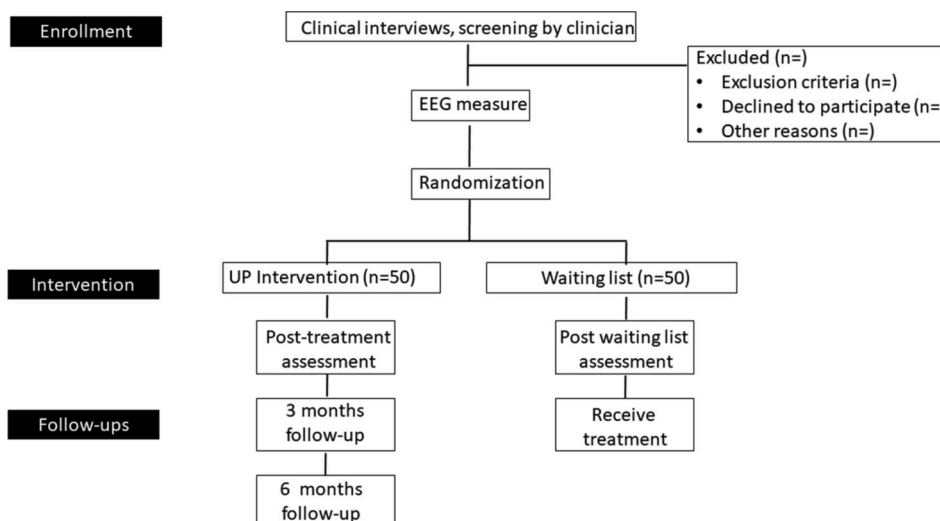
3. Recent suicide attempt (3 months or less ago).

Fig. 1. Study design: Three phases explanatory diagram.

4. Refuse to sign the informed consent.

5. Other relevant reasons determined by the clinician.

2.2.3.3. Relevant concomitant care and interventions that are permitted or prohibited during the trial. Patients that receive another psychological treatment should notify the therapist due to this will not be permitted and the patient would have to be excluded. Similar for starting to take antidepressants or anxiolytics.

Patients that start an exercise program or improving eating patterns should also mention to the therapist but would be allowed to continue in the treatment.

2.2.4. Withdrawal criteria

Participants will be withdrawn from this study if there are any concerns about their informed consent. Participants are allowed to withdraw at any point of the study without explanation to the therapist or researchers in charge. Patient's withdrawals will be registered and analyzed for future improvements of the study.

2.2.5. Randomization and blinding

The patients will be randomized to one of the two conditions. Afterwards, the therapist will conduct the participant's evaluation and will send an e-mail with the code of the patient to the main researcher, subsequently, the researcher will use the randomization software *GraphPad* [23]. The technique with which the randomization will be performed is Adaptive Random Covariation [24]. This technique has the advantage that it does not only randomly assign each participant to one of the established conditions, but also balances that both conditions have the same number of participants, thus avoiding decompensations between the groups. Once the randomization is completed, the main researcher sends back an email to the therapist and the main researchers to indicate in which of the 2 conditions the patient will be assigned. The trial participants will be blinded as to how many conditions exist in the study [25]. The patients will not be aware that there is an intervention group and a control group (see Fig. 2). The conditions of the study are only known by the researcher, the therapists, and the bioethics committee of the Autonomous University of Baja California. If for any reason unblinding is necessary and occurs, the bioethics committee of the Autonomous University of Baja California will be notified and will be reported in the results.

2.2.6. Eligibility determination and diagnostic assessment

Previous depression symptoms will be assessed for the determination of eligibility at intake using the depression symptom measures, capturing the severity and functional impairment, and will be diagnosed by the ODSIS [22]. In addition, intake decision diagnoses are established using the Scale of Suicide Ideation [26]. The Scale of Suicide Ideation, is utilized for eligibility determination at intake as a primary outcome measure at pre-test. Treatment history and previous diagnoses of AD

disorders will be assessed by a preliminary interview.

2.3. Standing intervention content

The UP was designed to address emotional disorders including AD. The UP is a manualized Emotion Regulation Transdiagnostic intervention that focuses on core emotion dysregulation through psychopathology to effect changes in diverse outcomes included positive and negative affects [7]. Although it is based on cognitive behavioral therapy, it contains strategies similar to that of treatments for specific disorders, such as cognitive reevaluation and exposure, but focused on emotional experience and not on situational factors [27]. The UP is composed of 8 modules, of which 5 are core modules since they are based on the components of emotion, such as: thoughts, emotions (physical sensations), and behaviors. These correspond to modules 3 to 7 of the protocol: 3) Training in emotional awareness; 4) Cognitive evaluation and reevaluation; 5) Emotional avoidance of behaviors driven by emotion; 6) Awareness and tolerance of physical sensations; and 7) Interoceptive and situational emotional exposure, the first two modules refer to improving motivation and understanding emotions and the last to prevent relapse [28]. Each of the five core modules address different aspects of emotion regulation, such as the development of tolerance skills directed to reduce unhelpful avoidance behaviors in emotionally-charged situations, and also focuses on cognitive flexibility to foster the development of cognitive reappraisal skills in contexts of high emotion [5]. It is recommended to implement the protocol within a range of 12–18 sessions with an approximate duration of 50–60 min each [28] (See Table 1).

Also, for a guarantee in the treatment adherence, three evaluations will be carried out during the therapeutic process, at the beginning, in the middle, and at the end of it, where the therapists will be evaluated by the patients. For this, the participant will receive 3 emails at different times with a link that will include the evaluation of the therapist. This will be done through the Therapeutic Alliance Negotiation Scale [29], developed and implemented in the Mexican population. The opinion of the patients about the treatment will be evaluated by the treatment effectiveness perception of the patient's by a brief Spanish adaptation of the Consumer Reports Effectiveness Scale (CRES-4), consisting of four items as a complementary tool to judge satisfaction with the treatment [30]. The answers obtained in these questionnaires will only be accessed by the main researcher of this study and these evaluations will be used to analyze the therapist's performance and patient's treatment effectiveness perception.

2.4. Primary outcomes

Primary outcomes refer to acceptability and diagnostic confirmation by self-reported measures including the patient's diagnostic confirmation, and physiological EGG gamma activity, all of them to be analyzed at baseline, intervention and follow ups by self-reported and physiological scores. Treatment acceptability measure in the study will be measured through the Therapeutic Alliance Negotiation Scale and the
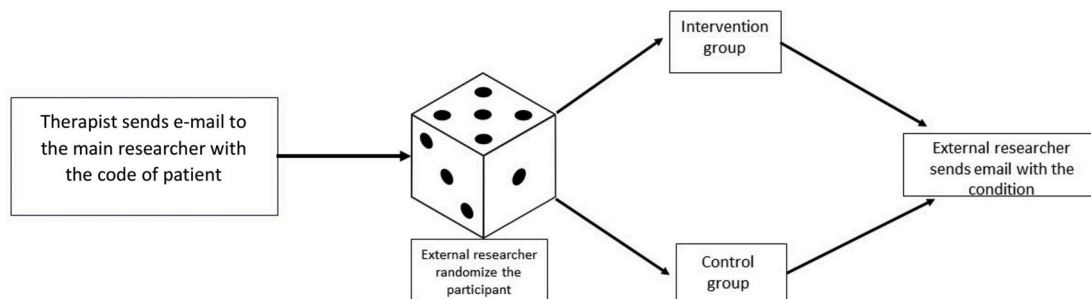

Fig. 2. Randomization and Blinding Explanatory Diagram ——Note: simplified process model.

Table 1
Modules and objectives of the Unified Protocol.

Module	Number of sessions	Objective
(1) Setting Goals and Maintaining Motivation	1 session	Increase of disposition and motivation for the behavioral change of the patient, as well as the promotion of self-efficacy.
(2) Understanding emotions	1-2 sessions	Psychoeducation about the nature of emotions and the components of emotional experience.
(3) Emotional awareness training*	1 -2 sessions	Help in identifying how the patient reacts to his/her emotions and training in emotional awareness centered on the present.
(4) Cognitive evaluation and reevaluation*	1 -2 sessions	Identify maladaptive thoughts and increase flexibility in value judgments.
(5) Emotional avoidance of emotion-driven behaviors *	1 -2 sessions	Identify emotional avoidance patterns and behaviors driven by maladaptive emotion regulation strategies.
(6) Awareness and tolerance of physical sensations *	1 session	Raise awareness about the role of physical sensations in emotional experiences.
(7) Interoceptive and situational emotional exposure *	4 -6 sessions	Exposure to internal and external emotional activators to increase tolerance for emotions and promote contextual learning.
(8) Maintenance and prevention of relapses	1 session	General review of the treatment and evolution of the patient.

Note: * = Central protocol modules (Barlow et al., 2017) [27].

Consumer Reports Effectiveness Scale (CRES-4), The AD self-reported emotional scores will be simultaneously measured in each phase of the study by the following scales.

2.4.1. Electroencephalogram EMOTIV EPOC+ [31]

It is a 14-channel mobile electroencephalogram that allows measurement of brain electrical activity patterns. The EEG performs measurements in the 4 lobes, for the frontal lobe it has electrodes in the areas AF3, AF4, F7, F8, F3, F4, FC5 and FC6; in time T7 and T8; in parietal P7 and P8; and in the occipital O1, O2. In addition, use the pairs of P3 and P4 as a reference. The electrodes use saline solution to boost brain electrical signals. As for the resolution of the signals, it uses sequential sampling at a rate of 128 samples per second at 14 bits that measures beta, alpha, gamma, and theta activity. In addition, it has a bandwidth of 0.2–43Hz and is connected via Bluetooth.

2.4.2. The Anxiety Disorders Interview Schedule (ADIS-IV) [32]

This structured interview follows the criteria of the DSM-IV, which allows a diagnosis of anxiety disorders to be obtained at the present time and the patient past experiences. In addition, it allows a functional analysis of anxiety disorders and provides information on mood disorders, substance abuse, and to screen for other condition's presence (e.g., psychotic disorders). The discomfort and interference score ranges from 0 to 8, where 0 is "no interference/discomfort" and 8 is "maximum interference/discomfort." The same version as Garcia-Palacios et al. was applied [33].

2.4.3. Generalized Anxiety Disorder 7 item scale (GAD-7) [34]

It is a short-scale tool that consists of 7 items as a measure of severity of GAD. The answers are based on how many days a week each item feels (symptoms). The Likert score is rated 0 to 3, with a total score of 21, where 0–4 "no anxiety is appreciated" and 15–21 "severe anxiety symptoms are appreciated." In addition, an eighth item is added where a question asks about the difficulty of having symptoms in the functioning of daily life, ranging from "no difficulty" to "extremely difficult". For this study the version is Spanish of García-Campayo et al. [35] was applied.

2.4.4. State-Trait Anxiety Inventory (STAI) [36]

This scale is divided into two factors that measure anxiety as a trait and anxiety as a state. The first factor measures how individuals generally feel, the second measures how they feel at a given time. Each of these factors is made up of 20 statements of how they generally feel at this time. A Likert type scale, that ranges from 1 (not at all) to 4 (almost always). Range score for each sub-test is 20–80, and the higher score indicating greater anxiety. This instrument has been validated in Spanish [37].

2.4.5. Posttraumatic Diagnostic Scale (PDS) [38]

The scale contains 17 items that assess the criteria and severity of posttraumatic stress disorder according to the DSM-IV in the last two weeks. The instrument is evaluated by the researcher on a Likert scale of 0–3, where 0 is "nothing" and 3 "a lot" with a maximum score of 51. The diagnosis is made when a symptom of appearance, three of avoidance is observed, and two of activation. For this study, the Spanish validated version of Novy et al. was used [39].

2.4.6. Yale-Brown Obsessive Compulsive Scale (Y-BOCS) [40]

For this study, the version adapted and translated to Spanish by Yacila-Giuliana et al. [41] was used. It is composed of 10 items: 5 related to obsessions and the other 5, to compulsions, having an answer option from 0 to 4 (from not presenting a symptom until presenting extreme symptoms). The diagnostic classification is based on the points of cut where 0 to 7 represents "without clinical manifestations", 8 to 15, "mild", 16 to 23, "moderate", 24 to 31 as "severe" and 32 to 40 as "extreme".

2.4.7. Beck Depression Inventory (BDI-II) [42]

It is a self-report designed to measure the presence and severity of depression symptoms in adolescents and adults. It consists of 21 items with Likert scale response options, ranging from 0 to 3, with the exception of items 16 and 18 that have 7 response options. The score ranges from 0 to 63, where 0–13 is minimal depression; 14–19 is mild depression; 20–28 is moderate depression; and 26–63 is severe depression. The Spanish version of Penley et al. [43] was used.

2.4.8. The Scale of Suicide Ideation [26]

The scale is intended to quantify and evaluate the frequency of attitudes, behaviors and plans to commit suicide through 19 items whose response options range from 0 to 2. The scoring range is 0–38 and a score greater than or equal to 10 indicates that the individual is at risk of committing suicide. The application of the scale is suspended if items 4 and 5 are scored with "0". The internal consistency of the scale in Mexico has a Cronbach's alpha of .93 [44].

2.5. Secondary outcomes

2.5.1. Overall Anxiety Severity and Impairment Scale (OASIS) [45]

This scale measures the anxiety-related severity and impairment through anxiety disorders. It is composed by 5 items, all of them focused to explore on the past week how often and how severe the patient experimented anxiety and fear. The 5 point Likert scale of answers are no anxiety, infrequent, occasional, frequent and constant anxiety. In this instrument, the participants are asked how the anxiety interfered with his/her activities related to work, school, home, social life, and relationships. The version in Spanish has been validated; an example is the study of González-Robles et al. [46].

2.5.2. Overall Depression Severity and Impairment Scale (ODSIS) [22]

This instrument is the modified version of the OASIS. It measures depression symptoms capturing the severity and functional impairment related to depression. It measures the frequency, intensity and interference with work, school, social life and relationships. One of the main differences with the OASIS is the replacement of one item assessing

impairment with an item that measures the loss of interest. The version in Spanish of the ODSIS has been implemented by Osma et al. [47].

2.5.3. Therapeutic Alliance Negotiation Scale [29]

This instrument allows the assessment of the functioning of the therapy received, by providing feedback of the quality of the perceived relationship from the patient's part. It is possible to use it to monitor therapeutic progress and prevent possible ruptures in the therapist-patient relationship. This scale was subject to an exploratory factor analysis with orthogonal rotation with 199 patients, the percentage of total variance explained was 63.3%, the measure of adaptation to the Kaiser-Meyer-Olkin sample was .85 and the Bartlett's test of sphericity was $\chi 2 = 885.40$, df $= 66$, $p = <.001$. By separating the positive and negative reagents, a Cronbach's alpha of .81 was obtained.

2.5.4. Consumer Reports Effectiveness Scale (CRES-4) [30]

This scale evaluates the satisfaction of the patients with the therapy received and how effective they perceived the therapy. It comprised by 4 items in a likert scale from 0 (completely dissatisfied) to 5 (completely satisfied) in the first and second items, and from 0 (I'm very bad, I barely manage to face things) to 4 (I am very well, I really like the life I have), in the third and fourth items. The scale is composed by 3 components: 1) Satisfaction towards the treatment (item 1), 2) Problem solutions (item 2), and 3) perception of emotional change (items 3 and 4).

2.6. Training of the therapists and adaptation of the protocol

The therapists will be trained by the main researcher of this project since he has experience of the implementation of the UP with a broader population, as well as the development of the adaptation of the content for the Spanish population. The training will consist of 2 sessions of 2 hours each week during 5 weeks, where each one of the modules of the UP are detailed and explained, using examples of the implementation of the protocol with real patients, while preserving and in all moment protecting the confidentiality of the patients. Also, it was developed a manual directed for therapists and patients, adapted from the book of Barlow et al. [27] to implement the UP. This manual was adapted for a viable version in Spanish for Mexican Population. At the end of the training, an exam will be applied to the therapists to ensure knowledge understanding and procedural competency.

2.7. Ethical considerations

The participants will be notified through a confidentiality agreement on how the protection of their data will be proceeded with, this agreement explains articles 12, 36, 47, 61–69, 73 and 134 of the Mexican Society of Psychologist's Code of Ethics [48].

Also, the participants must read and sign the informed consent to participate in this study.

This consent can be retrieved from the registration of the study in https://clinicaltrials.gov/ct2/show/NCT03916315. Participants that obtain a score that indicates serious disorder, and/or high suicidal ideation and intentionality will be directed to the corresponding institutions to receive the necessary treatment. Likewise, the participants who remain on the waiting list (control group), once the intervention with the experimental group is finished, will proceed to receive the UP treatment. The bioethics committee of the Autonomous University of Baja California, is allowed to monitor at any time that the process of the study is being conducted properly and following the protocol that was delivered to them for review and approval of this project. The organization that funded this project, will review every 6 months the development of the project and objectives fulfilled at the moment of reporting of the results.

2.8.1. Declarations

2.8.1.1. Ethics approval and consent to participate.
The research protocol was reviewed and approved by the Bioethics Committee of the Faculty of Medicine and Psychology of the Autonomous University of Baja California (internal control code: 414/2019-1).

Important protocol modifications will be informed properly to the Bioethics Committee of the Faculty of Medicine and Psychology of the Autonomous University of Baja California and Clinical Trials.

3. Data management and statistical analysis method plan

3.1. Data collection

All measures occur at baseline and at 3- and 6-months' follow-up assessments. Retention rates will be monitored and follow-ups with participants missing two or more sessions in a row will be followed up in order to assure that they will continue with the intervention and the planned measures. In case that it's considered necessary, the post measures can be conducted via telephone or email.

The instruments will be encoded and captured in databases. The results obtained will be analyzed later using the Statistical Package for Social Sciences (SPSS). For the analysis of the EEG, the similar analysis as Oathes et al. [14], will be conducted, were the EEG data will be eye artifact corrected and fast Fourier transformed then converted to amplitudes, averaged and squared so that power can be calculated for the gamma frequency band with average for each individual tasks during the protocol measuring of EEG activity (2 min base line, 5 min relaxation and 5 min worry induction). Finally, the averages will be log-transformed to normalize distributions. If obtained the necessary sample to carry out parametric tests (N = 30) [49], it is planned to perform analysis that includes a Pearson's correlation [50] to know if a relationship exists between the studied variables; Independent sample *t*-test to compare difference between the means of the evaluations will be carried out before and after the treatment in both cities (where it would be expected that there is no statistically significant differences between them), and to compare the control and experimental group before and after the treatment; and repeated measured t-tests for intra-group comparisons of before and after the intervention period in both the control and experimental groups. Failure to comply with the necessary N, the corresponding non-parametric tests of each of those mentioned above will be used. In addition, Chi square will be used to observe the differences in frequencies between the different anxiety diagnoses [51].

3.2. Sample size calculation

Due to the limited amount of resources and spaces available in both cities, 5 part-time therapists will be included in each city. With the constraint of a limited period of time, the sample size for this study is not derived statically as with a sample size calculation. The rationale for this is due to the limited resources that are available for the first study implementing the UP in a Mexican population. Therefore, a convenience sample has been selected for this RCT [52]. The total amount planned is of 100 participants, 25 in each condition in each city, giving a total for 50 participants for intervention and 50 participants for control group. This criterion was based on the minimum sample size. For experimental and quasi-experimental designs, at least 15 cases per group or 21 cases per group are needed for a one-sided hypothesis [53].

4. Discussion

The UP is a multi-disorder intervention with well-known feedback on efficacy from the international community on recent interventions applied worldwide. Processes and products from this project may have relevance and be adaptable to other Mexican cities aiming to mental

disorders and emotional transdiagnostic to address AD, and other mental impairments. This study will consist in conducting a RCT where the effectiveness of the UP will be tested within and between participants due the inclusion of a control group that will consist of a waiting list. Also, to measure the effectiveness of this treatment, subjective measures will be implemented, such as widely validated psychometrics and objective measures, like the electroencephalography tracking activity in the gamma rhythm.

As mentioned, the UP has been implemented in different countries, in Latin America, two well conducted randomized controlled trials were performed in Brazil [8,9], and are included in the systematic review and meta-analysis of Sakiris and Berle [5]. An UP intervention case was also performed in Colombia with a female participant exposed to an armed conflict, with proven efficacy patient the reduction of the symptomatology [54]. In Argentina, the UP was applied through group format in a sample of 23 patients that met the diagnostic criteria of panic attack, agoraphobia, social phobia, GAD, unspecified anxiety disorder, and major depression. The results performed a significant reduction of the symptoms; however, no follow-up was reported nor was reported on a control group [55]. The effectiveness of the UP regarding anxiety and affective disorders is clear [5].

It has been identified that Mexico is a developing country with a notorious lack of mental health caregivers working on the public service side, according to the statistics of the WHO, the country should have 12,000 psychiatrists and it only has 4600 [56]. Also, psychological treatment is typically offered to people with middle-to high-economic status by private psychological assessments, or to receive treatment in universities centers such as SURÉ, where the quantity of people requesting psychological support surpasses the amount of the therapists and spaces available. Also, in many Mexican cities like Juarez or Tijuana, serious mental health affectations are a common leading and increasing phenomenon that result in high suicidal rates [57,58].

The results of this study will be published in peer-reviewed journals and academic congress and also the data will be publicly available through the journals were the articles are published. Data such as full protocol, participant level data set, statistical code and data syntaxes will be available as well.

Also, it is intended to present the results of this RCT to healthcare professionals, mainly in Mexico and afterwards internationally. If the intervention is effective, this could be presented to the directors and managers of the Mexico's public health system, in order to consider the adaptation of this treatment to a broader population, and to be disseminated through the Mexican social security system. If positive results are obtained from this RCT, it can provide evidence to conduct larger trials in other Mexican states and to be conducted in longer periods with other disorders besides AD, such as depression and personality limit disorder to which the Unified Protocol also has shown to be effective [59,60].

There are several limitations that need to be considered when the results of this study are collected, and its effectiveness shared with the general and scientific community. First, due to the limited resources, such as time, available spaces, and limited amount of therapists, it was not possible to conduct a proper sample size calculation. Second, we do not have another treatment to compare the effectiveness of the UP, such as traditional CBT protocols or treatments developed and adapted from the UP and delivered solely by internet [61] or through a cellphone application.

Another limitation of this study is that the population is not restricted to a specific age range, it is a wide range (18–60 years old), a narrow age range is a better sample target. In addition, another limitation is the generalization of the study to another geographic location in Mexico, because this study targets specifically northern borderland cities. However, there is an urgent need for evidence-based interventions to be tested on Mexican population, and to reduce the prevalence of mood disorders in high violence contexts. Another consideration is the fact of the impact that a study of this kind can be useful to Mexico, as the first

UP intervention, which if the results are successful in reducing the symptomatology the patients, it could be a great contribution for the treatment of AD and similar disorders in the Mexican population.

Author's contributions

DRA formulated the research question, designed the study and drafted the manuscript, coordinates the study and drafted all the versions of the manuscript. CVS participated in the manuscript draft, coordinated the main analysis and drafted several sections of this proposal. AGC participated in formulating the research question, is involved in the coordination of the study, and edited drafts of the manuscript. VELC critically revised the manuscript and approved the final version as submitted. All authors revised the manuscript and read and approved the final manuscript.

Declaration of competing interest

Authors have no competing interests to declare.

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