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RESEARCH

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Acceptance and commitment therapy reduces perceived ostracism in suicidal patients

Emilie Olié^{1,2,3,4*}, Manon Malestroit^{1,2}, Véronique Brand-Arpon³, Philippe Courtet^{1,2,4} and Deborah Ducasse^{1,2,3}

Abstract

Introduction Ostracism increases the risk of depression and suicidal behaviors. Mindfulness training, which is at the core of third-wave behavioral therapies such as acceptance and commitment therapy (ACT), might reduce social distress and inhibit negative affect.

Methods This randomized controlled trial included 32 patients with a history of suicide attempt in the past year who followed seven weekly sessions of ACT or progressive relaxation therapy (PRT). To assess and compare the effects of ACT and PRT on social distress, patients performed a validated paradigm of social exclusion (the Cyberball Game) followed by completion of the Need Threat Scale (NTS) at inclusion (baseline) and within two weeks after the intervention ended (posttherapy).

Results The included patients were mainly women (N=28; 87.5%), and their mean age was 40 years (SD: 12 years). Twenty-six patients (81%) experienced current depression. The postintervention NTS score was greater (lower social distress) in the ACT group than in the PRT group (group × time interaction; $\beta = 0.47$, $p < 0.05$), even after controlling for depressive symptoms ($\beta = 0.27$, $p < 0.05$). The NTS score change (between baseline and posttherapy) was correlated with changes in dispositional mindfulness ($r = 0.46$, $p = 0.03$), cognitive fusion ($r = -0.61$, $p < 10^{-3}$) and acceptance ($r = 0.57$, $p < 10^{-2}$).

Conclusion ACT decreased social pain independently of its effect on depression. Reduced social pain was correlated with improved therapeutic processes and decreased suicidal ideation, highlighting the therapeutic potential of ACT for managing ostracism and suicide risk.

Keywords Suicidal behavior, Acceptance and commitment therapy, Ostracism, Cyberball game

Introduction

Ostracism (i.e., being ignored and excluded) [1] frustrates the basic human needs required for human survival, such as fulfillment, belonging, self-esteem, control and the meaning of existence. Ostracism is a painful experience

that threatens an individual's self-concept and leads to depression and suicidal behaviors [2, 3]. Suicide risk represents a major public health issue, with 700,000 people dying by suicide annually, according to the World Health Organization, making it the fourth leading cause of death among individuals aged 15–29. This statistic underscores the importance of addressing risk factors associated with suicidal behaviors, such as social exclusion. Most suicide victims experienced at least one or more adverse life events, in the last few months before their death [4]. Interpersonal conflicts, relationship breakdown and job loss or difficulties are among the most prevalent events, all of which are social stressors confronting the individual with some form of social exclusion and a threat toward

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their social status. The most recent psychological theories of suicide, i.e., the interpersonal theory of suicide [5], the three-step theory of suicide [6] or the integrated motivational-volitional model [7] include social stressors such as exclusion and threats to social status as fundamental elements in the development of suicidal ideation [8]. It is interesting to highlight that social exclusion facilitates risky decision-making underpinned by dysfunction of prefrontal cortex in suicide attempters [9]. Neuroimaging studies in suicide attempters suggest the presence of brain alterations associated with suicidal vulnerability not only in the prefrontal cortex but also in the temporal and parietal cortices [10], which are involved in social cognition processing [11]. Indeed, during the Cyberball game (a validated paradigm of social exclusion), activation of the left insula and supramarginal gyrus is lower in patients with a history of suicidal acts than in psychiatric and healthy controls [12].

Mindfulness training develops the awareness that emerges by intentionally paying attention to the present moment and by nonjudgmentally experiencing each moment. Interestingly, dispositional mindfulness is correlated with a reduction in the activity and connectivity of brain regions associated with social distress and negative affect inhibition, resulting in better emotion regulation and less distress following social exclusion [13]. Dispositional mindfulness also weakens the association between depressive symptomatology and suicidal ideation in patients with a history of suicidal depression [14]. Mindfulness is at the core of third-wave behavioral therapies, such as dialectical behavioral therapy, which contributes to preventing suicidal behaviors in patients with borderline personality disorder [15]. In a randomized controlled trial, we reported that in patients with a history of suicide attempts in the past year, acceptance and commitment therapy (ACT), a third-wave behavioral therapy, more efficiently reduced depressive symptomatology and suicidal ideation than did progressive relaxation training (PRT) [16]. The primary aim of this randomized control study is to determine whether ACT can reduce perceived ostracism in suicidal patients (using the Cyberball Game) independently of its effects on depression, thereby alleviating social distress that heightens the risk of suicidal behaviors.

Methods

Study design

The present study was a secondary analysis of data from a prospective randomized controlled trial (clinicaltrials.gov; Clinical Trial ID#NCT 02936700; posted on 2016-10-18) that compared ACT and PRT effectiveness for reducing suicidal ideation at month 3 after the intervention ended in patients with a history of suicide attempts

in the previous year [16]. Eligible participants were randomly assigned (1:1 ratio) to ACT or PRT for 7 weeks. The randomization sequence was centralized and computed in permuted blocks of two or four by the study statistician in an order unknown by the investigators.

Participant selection

Participants were recruited at the Department of Psychiatric Emergency and Acute Care, University Hospital of Montpellier (France). The inclusion criteria were age between 18 and 65 years and current suicidal behavior disorder according to the DSM-5 criteria (i.e., history of suicide attempt in the past year). A suicide attempt was defined as a self-damaging act carried out with some intent to die, distinguished from other types of self-destructive behavior [17].

The exclusion criteria were a lifetime history of schizophrenia, current alcohol/illicit drug use disorders, current manic or hypomanic episodes, a lifetime history of severe brain injury or neurologic disease, and pregnancy.

Treatments and procedures

The experimental intervention consisted of seven 2-h sessions (one per week) of ACT on the basis of reference books [18]. Using the ACT matrix [19], each session focused on a specific skill: (1) Values Identification and Clarification (conceptualization of values as a direction or internal compass, distinguishing between values and goals, and identifying the patient's personal values for the main areas of life), (2) Understanding the Struggle Trap and Using the Matrix (Explanation of the trap of struggling and presentation of the decision-making model based on the matrix that develops the capacity to act in alignment with one's values in the face of internal obstacles instead of engaging in experiential avoidance behaviors), (3) Acceptance (Capabilities for identifying and welcoming emotions, which are understood as a collection of transient bodily sensations), (4) Cognitive Defusion (changing the relationship to thoughts rather than the content of the thoughts, with techniques such as naming the story and prefacing thoughts with "I am having the thought that"), (5) Present Moment Contact (enhancing awareness and connection with the present moment), (6) Self as Context (identifying oneself as the indestructible context or observer in which all human impermanent experiences appear, rather than as the experiences themselves), (7) Integration and Planning Forward (integrating the skills learned throughout the program and planning for their continued application in daily life). The control intervention consisted of seven 2-h sessions (one per week) of PRT on the basis of Bernstein et al. [20]. Each session focused on learning to tense and relax groups of muscles. The PRT and ACT sessions

followed a similar pattern: homework review, acquisition of new therapeutic skills, and handing out a written summary. Both interventions were delivered by the same two therapists (DD and VA)

Clinical assessments

The clinical assessments were performed by two trained psychiatrists who were blinded to the group allocation. Patients were assessed within 2 weeks before therapy initiation (i.e., baseline) and within two weeks after therapy completion (i.e., post-therapy). At baseline, sociodemographic variables were recorded; lifetime psychopathology was assessed with the Mini-International Neuropsychiatric Interview, and borderline personality disorder was assessed with the Structured Clinical Interview for DSM-IV Axis II Disorders. At both visits, the following questionnaires were completed on the same day as the Cyberball Game (see below), prior to participating in the task. Current depressive symptomatology was assessed via the clinician-rated 30-item Inventory of Depressive Symptomatology (IDS-C30) and the Quick Inventory of Depressive Symptomatology Self-Report (QIDS-SR). Suicidal ideation in the last month and the number of lifetime history of suicide attempt were assessed with the Columbia–Suicide Severity Rating Scale (C-SSRS) [21]. The intensity subscore of the C-SSRS was used to quantify suicidal ideation, with item scores summed to produce an overall measure of ideation severity. The therapeutic processes were also assessed. The Acceptance and Action Questionnaire II (AAQ-II) [22] was utilized to measure psychological flexibility and acceptance, with higher scores indicating less psychological inflexibility. Cognitive fusion was assessed with the 28-item Cognitive Fusion Questionnaire (CFQ-28) [23], which quantifies the extent to which individuals are entangled with their thoughts. The Philadelphia Mindfulness Scale (PHLMS) [23] assessed mindfulness through its two subscales—awareness and acceptance—reflecting the individual’s capacity for present-moment awareness without judgment. The Mindful Attention Awareness Scale (MAAS) [24] measured attention to and awareness of present experiences, with higher scores signifying greater mindfulness. Current intake of psychotropic drugs was recorded.

Experimental social exclusion: the Cyberball game

The Cyberball game, a validated paradigm of social exclusion [25], was performed before therapy initiation (i.e., baseline) and after therapy completion (i.e., posttherapy). The participants were informed that they would play with two other players. The participants played with a pre-set computer program and were given a cover story to ensure that they believed the other players were real. The

Cyberball game comprises three successive conditions. In the first condition (implicit social exclusion), the participant watches the other “players” who play the Cyberball game. In the second condition (inclusion), the participant plays with the other two players and receives the ball as many times as the two virtual players do. In the third condition, the participant is progressively excluded (the two virtual players do not throw the ball to the participant). In total, the session includes 180 ball tosses (60 tosses per condition). After the Cyberball game, patients completed the Need Threat Scale (NTS) [26] to measure their perception of social exclusion or social distress. The NTS assesses 20 subjectively experienced consequences of being excluded during a game, including sub-scores for self-esteem (e.g., “I feel liked”), belongingness (e.g., “I feel rejected”), meaningfulness (e.g., “I feel invisible”) and control (e.g., “I feel powerful”), on a scale ranging from 1 (not at all) to 5 (very much). In addition, items were reverse coded when appropriate and averaged to generate a composite score of social distress. Higher scores indicate lower perceptions of social exclusion.

Statistical analyses

Descriptive statistics were used to summarize the baseline characteristics of the two groups: medians and min–max for continuous variables and frequencies and percentages for categorical variables. Groups were compared via the Wilcoxon rank-sum test, Chi-square test (χ^2), or Fisher’s exact test. The intervention effect over time (changes in total NTS score and 4 sub-scores) was analyzed via a mixed model for repeated measures. The model included time (baseline and post-therapy), group (ACT and PRT), and time-by-group interactions as fixed effects and a random patient effect. Additionally, a repeated measures correlation analysis of the NTS total score, suicidal ideation severity, and scores of the different therapeutic process questionnaires was performed to assess their associations over time. Statistical significance was set at $\alpha=0.05$, and analyses were performed with R version 4.3.3 (R Core Team, 2024), R Foundation for Statistical Computing, Vienna, Austria. The data are available upon request to the authors.

Results

The sample included 32 patients as two patients from the PRT group did not complete the study. The sample was mainly female (28 women; 87.5%) with a mean age was 40 years (SD: 12 years). Twenty-six patients (81%) had current depression according to the DSM-5 criteria. Sociodemographic and clinical data of the participants in the two groups (ACT and PRT) were not significantly different (Table 1)

Table 1 Description of the two groups at baseline

	<i>PRT</i> <i>N</i> = 15	<i>ACT</i> <i>N</i> = 17	<i>p</i> -value
	Median (min-max)	Median (min-max)	
	N (%)	N (%)	
Sociodemographic variables			
Age (years)	39 (21-54)	37 (20-62)	0.8
Women	12 (80%)	16 (94%)	0.3
Married	5 (33%)	7 (41%)	0.6
Education level (years)	14.00 (8-17)	14 (11-18)	0.7
Lifetime psychopathology			
Major depressive episode	13 (87%)	15 (88%)	>0.9
Bipolar disorder	8 (53%)	7 (41%)	0.5
Social phobia	6 (40%)	8 (47%)	0.7
Generalized anxiety disorder	8 (53%)	11 (65%)	0.5
Alcohol / substance use disorder	5 (36%)	5 (29%)	>0.9
Eating disorder	6 (40%)	4 (24%)	0.5
Borderline personality disorder	8 (53%)	9 (53%)	>0.9
Number of suicide attempts	2 (1-6)	2 (1-10)	0.7
Current psychological state			
Major depressive episode	12 (80%)	14 (82%)	>0.9
IDS-C30 score	20 (9-53)	34 (2-65)	0.2
QIDS-SR score	12 (4-21)	17 (1-25)	0.4
Suicidal ideation intensity (C-SSRS)	14 (0-24)	13 (0-25)	0.7
Psychotherapeutic processes			
AAQ-II score	30 (14-56)	24 (13-51)	0.3
CFQ-28 score	127 (92-166)	143 (93-181)	0.6
PHLMS score	60 (50-73)	61 (44-68)	>0.9
MAAS score	51 (25-79)	48 (30-81)	>0.9
Current drug intake			
Antidepressants	13 (87%)	14 (82%)	>0.9
Anxiolytics	9 (60%)	10 (59%)	>0.9
Hypnotics	5 (33%)	5 (29%)	>0.9
Antiepileptics	2 (13%)	4 (24%)	0.7
Antipsychotics	3 (20%)	3 (18%)	>0.9
Lithium salts	0 (0%)	2 (12%)	0.5

In the Cyberball game, all participants felt ignored and excluded and estimated the percentage of ball tosses they received realistically (i.e., retrospective manipulation check) (Table 2). The feeling of exclusion did not differ between the intervention groups or across time. Conversely, the feeling of being ignored significantly decreased only in the ACT group between baseline and posttherapy.

The baseline NTS total score (2.64, SD=0.59 vs. 2.57, SD=0.68); $p=0.76$) and subscores were not different between the ACT and PRT groups. For the NTS total score, the mixed model revealed a significant main effect of time ($\beta=0.35$ $p<0.05$), but not of group ($\beta=0.07$, $p=0.11$), and a significant time×group interaction ($\beta=0.47$, $p<0.05$). The time×group interaction was also significant for the belonging subscore ($\beta=1.02$, $p<0.05$). Compared with the baseline values, the increases in the posttherapy NTS total score ($p=0.02$) and subscore ($p>10^{-2}$) were greater in the ACT group than in the PRT group (Table 2).

After adjusting for depression level (QIDS-SR score), the time×group interaction remained significant for both the NTS total score ($\beta=0.27$, $p<0.05$; Fig. 1) and the belonging subscore ($\beta=0.87$, $p<0.05$).

The changes in the AAQ-II, PHLMS and MAAS scores were positively correlated with the increase in the NTS score ($r=0.57$, $p\leq 10^{-2}$; $r=0.46$, $p=0.03$; and $r=0.5$, $p=0.01$, respectively) between baseline and posttherapy. The changes in the CFQ-28 score and suicidal ideation

severity were negatively correlated with the increase in the NTS total score ($r=-0.61$, $p<10^{-3}$ and $r=-0.33$; $p=0.06$, respectively) between baseline and posttherapy.

Discussion

Compared with PRT, ACT resulted in a reduction in the NTS total score in patients with a history of suicide attempt in the past year, independent of the improvement in depressive symptomatology. The Cyberball game elicits painful feelings due to social exclusion (i.e., social pain), which shares features with physical pain [27]. Our finding is particularly compelling because it underscores the capacity of ACT to address social perceptions, in addition to its effect on depressive symptoms. The reduction in the perception of social exclusion is noteworthy, given the established link between ostracism and a heightened risk of suicidal behaviors [28]. It also aligns with the temporal model of ostracism effects proposed by Williams [29]. According to this model, interventions such as ACT prevent the intense psychological distress associated with the resignation stage by promoting adaptive coping strategies during the previous reflexive and reflective stages of the reaction to ostracism.

Moreover, the feeling of being ignored, which implies the interpretation of negative intent from others toward oneself, was significantly reduced by ACT but not PRT. ACT may help prevent the reflexive stage of ostracism by mitigating the perception of being ignored. Indeed, ACT may equip individuals with the resilience needed for not

Table 2 Perception of social exclusion after the Cyberball Game

	PRT			ACT			PRT vs. ACT	
	Baseline	Post-therapy	Baseline vs. post-therapy	Baseline	Post-therapy	Baseline vs. post-therapy	Baseline	Post-therapy
	Mean (SD)	Mean (SD)	(p-value)	Mean (SD)	Mean (SD)	(p-value)	(p-value)	(p-value)
I was excluded	3.00 (1.41)	3.00 (1.13)	0.90	3.29 (1.40)	2.31 (1.58)	0.07	0.60	0.20
I was ignored	3.00 (1.31)	3.13 (0.99)	0.80	3.18 (1.29)	2.19 (1.42)	0.04	0.70	0.04
%balls received	18 (9)	21(10)	0.40	17 (8)	34 (24)	0.02	0.80	0.06
NTS total score	2.57 (0.68)	2.93 (0.57)	0.07	2.64 (0.59)	3.47 (0.73)	<10⁻³	0.76	0.02
Belonging	3.09 (0.82)	3.11 (0.55)	0.90	2.86 (0.88)	3.89 (0.80)	<10⁻³	0.40	<10⁻²

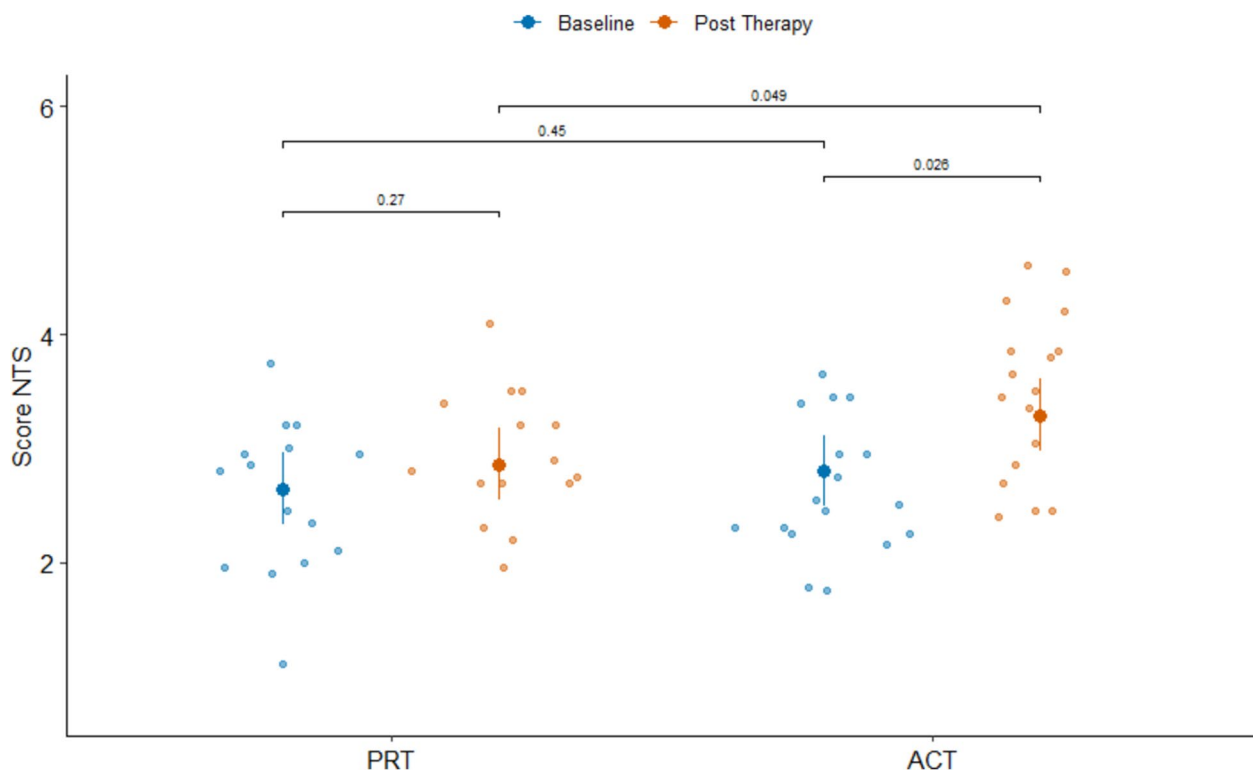


Fig. 1 Need Threat Scale total score before (baseline) and after the intervention (post-therapy). ACT Acceptance and Commitment Therapy, NTS Need Threat Scale, PRT Progressive Relaxation Therapy; p values after adjusting for depression severity

interpreting a lack of ball tossing as a personal disregard, thus avoiding the initial pain response described by Williams.

The NTS total score changed significantly from before to after the intervention, with different trajectories in the ACT and PRT groups. By fostering increased psychological flexibility, ACT encourages a more adaptative relationship with one's thoughts and feelings [30], thereby mitigating the threat of ostracism to fundamental needs. This effect was particularly significant for the belonging subscore, reinforcing the pivotal role of social connections in the management of suicidal patients. Indeed, low belongingness is at the core of the interpersonal theory of suicide [31, 32]. The improved belongingness through the ACT offers perspectives for interventions, highlighting the ability of this therapy to target and improve critical dimensions that contribute to the suicidal process.

We found that suicidal ideation severity and the perception of social exclusion decreased concomitantly. However, the correlation between the increase in the NTS total score (reduction in social distress) and the reduction in suicidal ideation severity (C-SSRS score) was not significant, probably due to a ceiling effect. Indeed, only 11 patients (34%) reported active suicidal ideation, limiting the possibility of achieving statistical

significance. Nevertheless, this observation strengthens the importance of reducing social distress in suicidal patients. Moreover, we found that social distress progressively decreased with changes in therapeutic processes, including psychological flexibility, cognitive defusion, and mindfulness. It emphasizes the pivotal role of ACT in bolstering reflective coping strategies [29]. This form of adaptive coping is instrumental for potentially thwarting the progression to the resignation stage, where enduring psychological distress becomes a significant concern. Notably, such enduring distress is exacerbated by pain catastrophizing, a cycle of rumination that amplifies the perception and impact of pain. Pain catastrophizing, marked by magnification, rumination and a pervasive sense of helplessness about pain, considerably increases the intensity and persistence of psychological distress. A recent study reported that in patients with low back pain, pain catastrophizing is an independent risk factor for progression to chronic widespread pain [33]. Moreover, pain catastrophizing is enhanced by experiential avoidance (an attempt to evade or escape unwanted internal experiences, including thoughts, feelings, and bodily sensations), which is targeted by the ACT. The relationship between fear-avoidance beliefs and pain intensity indicates a

reciprocal association: patients with increased fear avoidance have greater pain intensity, which in turn induces greater fear avoidance [34]. Moreover, a comprehensive meta-analysis [35] revealed moderate to strong associations between experiential avoidance and suicidal behaviors. By fostering psychological flexibility, mindfulness, and cognitive defusion, ACT directly counters the detrimental cycles of experiential avoidance, pain catastrophizing, and fear avoidance and decreases painful feelings related to the social exclusion and suicidal dimensions.

ACT, as a third-wave cognitive-behavioral therapy, emphasizes acceptance and psychological flexibility, which are crucial for navigating through disturbing thoughts and experiences. This approach diverges from attempts to control or avoid these experiences and facilitates a profound change in the individual's relationship with distressing thoughts and sensations [36]. By decreasing rumination, ACT facilitates a shift toward increased resilience and meaningful life engagement. This enhancement of psychological processes through ACT highlights a shift toward a resilient self-concept anchored in a meaningful life and counteracts the increased implicit associations of "death" and "me", relative to "life" and "me", caused by ostracism [37]. As self-concept is at the root of all our experiences [38], understanding the processes underlying self-concept changes, at the core of recent developments in relational frame theory [39], is a major concern in psychotherapy.

Our results are in line with those of a previous study showing that dispositional mindfulness, a key aspect of ACT, is negatively associated with the perception of exclusion and ruminations following experimental exclusion [40]. They also provide insights into the dynamic nature of this association through the prospective design of data collection, which highlights the transformative potential of mindfulness and acceptance in addressing social pain. By emphasizing psychological flexibility and acceptance, ACT helps individuals reinterpret experiences of social exclusion, alleviates immediate distress, and promotes long-term well-being and resilience despite ostracism.

For this study, patients with current suicidal behavior disorders were included because the risk of reattempts is highest in the first year following a suicide attempt. ACT may be initiated during this critical period because, in these patients, it reduces suicidal ideation and depression [16] as well as perceived ostracism, which may amplify interpersonal difficulties and barriers to adherence to care. The decreased feeling of social exclusion may contribute to reducing suicidal ideation, restoring social connections, reducing loneliness, and improving adherence to care.

Our study has several limitations. The sample was small and included mainly women who feel more excluded and ignored in reaction to social exclusion [41]. This may limit the generalizability of our results. The Cyberball game has never been repeated in previous studies, raising the question of a learning effect. However, the absence of a significant reduction in the posttherapy NTS total score in the control group (PRT) and the realistic estimation of ball receipts indicate task validity even the second time.

The findings of this study pave the way for new research directions on the application of ACT in reducing social distress among suicidal patients. A valuable area of future research could explore whether ACT might also reduce perceived ostracism in other at-risk populations, such as adolescents or individuals with personality disorders. Future research could also investigate the underlying mechanisms through which ACT reduces social distress, particularly by examining neurobiological features using functional MRI or peripheral measures (for example inflammatory or epigenetic markers).

In conclusion, ACT offers a significant therapeutic advantage to individuals who experience perceived ostracism, particularly those with a history of suicide attempt. Through psychological flexibility, mindfulness, and cognitive defusion, ACT reduces immediate social pain and may promote long-term resilience. The transformative potential of ACT, in redefining the relationship with distressing thoughts and experiences, underscores the critical role of relational frame theory advances in the future of psychotherapy to address the complex interplay of self-concept, social pain and suicidality. The significant reduction in perceived social exclusion achieved through ACT in our study suggests that this approach could be integrated more broadly into therapeutic protocols for patients at suicide risk, particularly in the early stages of post-attempt care when the risk of recurrence is high.

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Author contributions

DD, EO, PC have made substantial contributions to the conception and design of the work; DD, EO, VBA have made substantial contributions to the acquisition, MM have made substantial contributions to analysis, EO and DD have written the first draft of the work. All authors have made substantial contributions to interpretation of data; and substantively revised the work. All authors have approved the submitted version (and any substantially modified version that involves the author's contribution to the study); All authors have agreed both to be personally accountable for the author's own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

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Data availability

Data is available on request of the authors as written in the text.

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the CONSORT ethical guidelines. Written informed consent was obtained from all participants to participate in the study. All the participants provided written informed consent. The study was approved by the Montpellier University Hospital, CPP Sud Méditerranée IV ethics committee (approval number ID-RCB: 2014-01781-46).

Competing interests

The authors declare no competing interests.

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