Relationship Between Emotion Regulation and Suicide Ideation and Attempt in Adults and Adolescents: A Systematic Review

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Abstract

Introduction: Suicide is one of the main causes of death in adults and adolescents, so research focused on identifying risk factors for suicidal behavior is needed. In recent years, emotion regulation, mainly the presence of difficulties regulating one´s own negative emotions, has been associated with negative mental health outcomes. *Objective:* The purpose of this study was to systematically review the available evidence on the association between emotion regulation and suicide (ideation and attempt) in both adults and adolescents. *Method:* A systematic search of scientific articles published in English and Spanish was carried out through the databases PsycINFO, MEDLINE, Scopus, and the Cochrane Library. *Results:* We identified 76 eligible studies, of which 70 reported that people with difficulties in emotion regulation reported higher levels of suicide ideation and more suicide attempts. The results were consistent in adolescents and adults, in clinical and general population samples, and when studies assessed both emotion regulation processes and strategies. However, few studies were longitudinal and most of them were with women. *Conclusions:* We discuss the theoretical implications of the results, suggesting that actual psychological models might benefit from considering individual differences in ER in understanding why people engage in suicide behavior. Clinical implications are also discussed.

Key words: suicide, emotion regulation, systematic review.

Highlights:

- Difficulties regulating one's emotions is associated with suicide behavior (SI and SA).
- Consistent results at all the ages and in the clinical and general population.
- Individual differences in ER could help researchers to understand suicide.

1.

2. Introduction

Suicidal behavior is conceptualized as a "range of behaviors that include thinking about suicide or ideation, planning for suicide, attempting suicide and suicide itself" (World Health Organization [WHO], 2014, p. 12). It is the fifteenth leading cause of death in the general population, accounting for 1.4% of all deaths (WHO, 2014), and the second among people aged 15–24 years (Center for Disease Control and Prevention [CDC], 2016). Consequently, research aimed at identifying predictors of suicide is much needed (Bender et al., 2010).

Several theoretical models explains suicide from different perspectives. From the psychological approach, one of the more contemporary and comprehensive theories is the *Interpersonal–psychological theory of suicide* (IPTS; Joiner, 2005). This model emphasizes three key factors: perceived burdensomeness (sense of being a liability to others), thwarted belongingness (loneliness and the absence of reciprocal care), and capacity for suicide (capacity to defeat the self-preservation instinct). Feelings of burdensomeness and low belongingness may instill a desire for suicide, however, individuals must also have the capability to enact lethal self-injury, and it is result of a repeated exposure to painful and provocative experiences (e.g., non-suicidal self-injury [NSSI], physical abuse, etc.). A systematic review and meta-analysis tested these posited pathways and showed a significant relationship between the interaction of thwarted belongingness, perceived burdensomeness, and capability for suicide with prior SA. However, the effect sizes for these interactions were modest (Chu et al., 2017).

More recently, the *Integrated motivational–volitional model of suicidal behavior* (IMV; O'Connor, 2011) was proposed to expand the IPTS. This model distinguishes between a motivational phase (ideation/intention formation) and a volitional phase

(behavioral enaction). It contributes to Joiner's model by emphasizing the relevance of feelings of being trapped, which are triggered by defeat/humiliation appraisals, and the influence of volitional moderators (e.g., impulsivity, ruminative processes or capability for suicide, among others). Several studies have tested the IMV or its components (Dhingra et al., 2015; O'Connor et al., 2012), showing that the main components of the model (defeat and feeling entrapment) are associated with suicide (O'Connor et al., 2013; Owen et al., 2018; Wetherall et al., 2018).

Whereas the IPTS and IMV have improved our understanding about suicide, it remains in many ways unpredictable (Leavey et al., 2017). Thus, an increased effort is important to identify additional factors that explain suicide. A common factor of the IPTS and IMV key variables, such as perceived burdensomeness, thwarted belongingness, hopelessness, or feeling of defeat and entrapment, is that they are all associated with the experience of emotional distress. Research has shown that people differ in the way that they regulate their emotions and emotional distress (Gross, 1998), and that individual differences in emotion regulation (ER) is a transdiagnostic risk factor implicated in psychopathology (Aldao et al., 2010; Fernandez et al., 2016). From this perspective, research about emotion regulation (ER) would help to get a better understanding about why people increase their suicidal behavior (Eaddy et al., 2018; Mayorga et al., 2018).

According to Gross (1998), ER refers to the processes by which we influence which emotions we have, when we have them, and how we experience and express them. From the process model of ER (Gross, 1998; 2002; 2014), a key variable are the ER strategies, defined as behavioral and cognitive methods by which individuals regulate their emotions (Gross, 1998, 2008). People might use different ER strategies at different points of the emotion process and Gross (1998, 2002, 2014) proposes five families of ER strategies: *situation selection* (approaching or avoiding some places,

people, or things as a way to regulate emotion), *situation modification* (intentional change or adjust of situation to modify the emotional impact), *attentional deployment* (the person selects the aspects of the situation to focus on), *cognitive change* (refers to selecting with which of the possible meanings the person stays faced with a certain situation) and, finally, *response modulation* (when an emotional response has generated, the person attempts to influence to regulate it). A question that research on ER has focused is whether people with mental health problems are more prone to use strategies that are less effective to regulate their affect.

A number of studies have reported that psychological disorders are positively associated with the use of different ER strategies, called "maladaptive," such as rumination, emotion suppression, worry, catastrophizing, or avoidance, whereas other "adaptive" strategies, such as cognitive reappraisal, acceptance, or problem solving, are related to more positive outcomes (Aldao & Nolen-Hoeksema, 2011; Aldao et al., 2010). On the other hand, different lines of research have aimed to examine which processes are implicated in the selection and maintenance of these "maladaptive" strategies (Gross, 2014). Different factors such as lack of awareness and clarity about emotions, nonacceptance of emotions, limited access to ER strategies, or negative expectancies about ER ability, among others, have been found to be associated with the use of maladaptive strategies (Kwon et al., 2020; Vine et al., 2014) and higher levels of psychopathology (Lavender et al., 2015; McLaughlin et al., 2007; Tull et al., 2007; Weinberg & Klonsky, 2009).

Taken together, both specific ER strategies and the processes that influence the selection and maintenance of these strategies could be relevant in understanding suicide. From suicide models, such as IPTS and IMV, key distress variables (e.g., perceived burdensomeness, thwarted belongingness, hopelessness or feeling of being trapped) are

associated to negative emotion responses and the existence of difficulties in their regulation may be involved in the occurrence of suicidal ideation and/or suicide attempts.

Our study

Whereas psychological approaches such as the IPTS and IMV have helped us to get a better understanding of suicide, additional research effort is needed to obtain a more complete answer as to why people die by suicide. A closer look at which ER processes and strategies are associated with suicidal behavior may help to understand it.

Previous systematic reviews have examined the associations between suicide and some specific ER strategies (e.g., rumination; Rogers & Joiner, 2017) or related construct to ER (e.g., emotional intelligence; Dominguez-Garcia & Fernandez-Berrocal, 2018). However, to our knowledge, no previous studies have examined the relationships between ER and suicide. Taking this into account, and considering the growing interest in the suicide research in recent years, we conducted a systematic review of the literature on this relationship. Our main objective was to achieve a global vision and to develop a clear picture of the current state of research about the relationship between ER and suicide (both SI and SA), in order to allow us to consider complementing existing studies, such as incorporating new and futures lines of investigation.

3. Method

2.1 Selection of Studies

We conducted systematic searches in four psychological and medical databases—PsycINFO, Scopus, MEDLINE, and the Cochrane Library—in June 10-12, 2021. We included articles published in English or Spanish in scientific journals, without limit to the years of publication. Articles were searched using the following combination of terms: “emotion* dysregulation,” “emotion* regulation,” “affective

regulation," "affective dysregulation", "mood regulation" and "suicid*," "suicide attempt," "suicid* ideation", "suicid* behavior," "behavioral suicide." All terms were searched as a keyword or as a term in the title or abstract, as well as whether it was used in the MeSH and Thesaurus terms in MEDLINE and PsycINFO, respectively.

2.2 Inclusion and Exclusion Criteria

The first criterion for inclusion was to be an empirical study about the relationship between ER and suicide; we excluded theoretical studies, reviews, and meta-analyses. We focused on studies that examined, on the one hand, the processes associated with ER (e.g., emotional clarity, negative expectancies of ER, or emotional dysregulation), and, on the other hand, specific ER strategies (e.g., rumination, suppression, reappraisal). Thus, studies had to evaluate ER processes and/or strategies using validated measures of ER. This led us to exclude studies evaluating others constructs related to ER, such as negative urgency, distress tolerance, or coping strategies. We included studies examining SI and/or SA while excluding studies researching others related variables (e.g. suicide attitudes or NSSI). In those studies, which measured suicide generally, in terms of suicidality, probability of suicide, or suicide risk, we examined whether they reported specific results measuring SI/SA. We included studies with both clinical and nonclinical samples and with adolescents and adults.

2.3 Literature Searches

Database searches identified 1695 relevant studies (Figure 1): 700 in MEDLINE, 870 in PsycINFO, 863 in Scopus, and 129 in the Cochrane Library. After elimination of duplicate articles, there were 1367 potentially eligible studies. Two authors reviewed titles and abstracts of the studies in parallel and excluded 1189, leading to a total of 178 studies. Most publications at this stage were excluded because they did not examine ER and suicide. In the next step, full text articles were read and 76 met the previously

presented criteria. Most of the papers excluded in this step were studies that measured other constructs related to ER, but did not assess ER processes or strategies (e.g., negative urgency, distress tolerance, or general coping strategies) or suicide as a construct that did not measure a real suicide intention (e.g., NSSI, suicide attitudes). All screening was performed independently by two investigators (90% of agreement); in case of disagreement about, a third researcher was consulted.

2.4 General Characteristics of the Included Studies

Key information about the studies reviewed is in Table 1 (ER and SI in adults and young adults), Table 2 (ER and SI in adolescents), Table 3 (ER and SA in adults and young adults), and Table 4 (ER and SA in adolescents). These tables describe the size and characteristics of the sample, measures, design used, and the principal findings of each study. The study samples included both clinical and general population samples. In total, 38 studies examined ER and SI, 28 were with adults (11 clinical, 16 general population and one with general and clinical sample) and 10 with adolescents (3 clinical, 6 general population samples and one with both general and clinical). On the other hand, 38 studies investigated ER and SA: 32 were with adults (15 with clinical samples, 14 with general population samples, and 3 with both clinical and general population samples), and 6 with adolescents (3 with clinical samples, one with a general population sample, and 2 with both clinical and general population samples). All studies used a cross-sectional design except four longitudinal studies (Khurana & Romer, 2012; Kuehn et al., 2020; Miranda et al., 2013; Raudales et al., 2019) and two studies which carried out both cross-sectional and longitudinal designs (Quintana-Orts et al., 2020; Rania et al., 2020). In a large proportion of the studies, the samples mainly comprised female participants.

Regarding ER processes and strategies, 57 studies investigated processes underlying ER, 15 studies focused on ER strategies and the remaining 4 focused in both processes and some strategies (Crespo-Delgado et al., 2020; Fadoir et al., Goodnight, 2019; Mallorquí-Bagué et al, 2018; Mohammadzadeh et al, 2019). The most employed measure of ER processes in these studies was the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), used in 44 studies. This scale assesses different ER processes (awareness, clarity, nonacceptance, impulse, goals, and strategies) and offers a total index of emotion dysregulation. In terms of the suicide measures, a wide range of measures was used.

4. Results

3.1 Emotion Regulation and Suicidal Ideation Studies in Adults and Young Adults

Twenty-eight studies investigated the relationships between ER and SI in adults and young adults (see Table 1), of which 11 used clinical samples, 16 used general population samples and one study used both clinical and general sample. All studies used a cross-sectional design except two (Khurana & Romer, 2012; Raudales et al., 2019), which carried out a 1-year and six months follow-up longitudinal studies, respectively.

Regarding clinical samples, most of studies focused on ER processes and assessed them through the DERS. The researchers found in general that emotion dysregulation was positively correlated with SI in several mental health problems: bipolar, borderline personality, cannabis use problems and eating disorders (see Table 1). In addition, Rogers and Joiner (2016) found that perceived burdensomeness was fully responsible for the relationship between affective dysregulation and SI and Raudales et al. (2019) found that elevated general emotion dysregulation significantly

predicted increases in SI at month-six follow-up. Concerning the use of ER strategies, individuals with SI showed a higher use of maladaptive ER strategies (e.g., suppressing negative emotions) and lower scores in cognitive reappraisal (Azadi et al., 2019; Forkmann et al. 2014; Lynch et al., 2004).

With regard to general population samples, studies focused on ER processes showed positive associations between emotion dysregulation and SI, except Cheung et al. (2018). These results were consistent using different measures of ER and SI, as well as cross-sectional and longitudinal study designs. Furthermore, Lemaigre and Taylor (2019) found that emotion dysregulation significantly mediated the relationship between childhood trauma and SI, and Tucker et al. (2016) found direct and indirect effects of emotion dysregulation on SI through increased anxiety sensitivity cognitive concerns. Moreover, lack of emotional clarity and access to ER strategies accounted for the positive relationships between perfectionistic concerns and perfectionistic strivings and SI (Zeifman et al., 2020). The remaining five studies focused on suppression and cognitive ER strategies (Amazue et al., 2019; Flores-Kanter et al., 2019; Franz et al., 2021; McLafferty et al., 2020; Ortiz et al., 2019), and found a positive relationship between suppression strategies and SI and a negative association with cognitive reappraisal, except Franz et al. (2021), who found that higher levels of reappraisal and suppression were associated with less stress and SI. Moreover, other cognitive ER strategies (rumination and catastrophizing) had a larger contribution to SI (Flores-Kanter et al., 2019).

Finally, Ponzoni et al. (2021) found that SI correlated significantly with all DERS dimensions in clinical and general population, and that emotion dysregulation moderated the relationship between vulnerable narcissism and SI.

3.2 Emotion Regulation and Suicidal Ideation Studies in Adolescents

Ten studies (3 with clinical, 6 with a general population sample and one study with both clinical and general) related ER and SI in adolescent samples focused on ER processing and used a cross-sectional design, except Quintana-Orts et al. (2020), who also conducted a second study with a longitudinal design and focused on cognitive ER strategies (see Table 2).

Emotion dysregulation correlated positively with suicide risk, operationalized as an increase continuous variable from nonspecific to active SI to SI with a plan (Eaddy et al., 2018), in adolescents with mental problems. O'Neil Rodriguez and Kendall (2013) showed that emotion dysregulation was significantly and positively correlated with higher levels of SI after controlling for depressive symptomatology. However, in multivariate analysis, only anxiety symptomatology was associated with SI.

Similar results were found in general population samples. Besides, Khanipour et al. (2015) found that only impulse control problems remained significantly associated with SI in the regression model in a sample of adolescents with a history of childhood maltreatment. On the other hand, Quintana-Orts et al. (2020) found that adaptive cognitive ER strategies partially mediated the link between emotional intelligence and SI both cross-sectionally and prospectively.

3.3 Emotion Regulation and Suicide Attempt in Adults and Young Adults

Thirty-two studies examined the associations between ER and SA in adults and young adults (see Table 3): 15 using clinical samples, 14 using participants from the general population, and the remaining 3 studies using both clinical and general population samples. Of all the studies, 24 focused only on ER processes, 5 on ER strategies, and finally 3 studies investigated both ER processes and strategies. All of these were cross-sectional designs, except two longitudinal studies (Kuehn et al., 2020; Miranda et al., 2013) and one study that used both cross-sectional and longitudinal designs (Rania et al., 2020).

Regarding clinical samples and ER processes, studies were conducted with psychiatric patients presenting a range of clinical diagnoses (eating disorders, alcohol dependence, depression, posttraumatic stress disorder, borderline personality disorder) and other clinical problems. In general, the authors found positive correlations between emotion dysregulation and SA, but some studies did not find these relationships (see Baer et al., 2018; Grandison et al., 2020; Silvers et al., 2016). Other studies examined the effect of both ER processes and strategies. Mallorquí-Bagué et al. (2018) found that patients with gambling disorder and SI and SA reported higher levels of emotion dysregulation and a higher frequency of suppression and a lower frequency of reappraisal. Vasudeva and Singh (2017) reported a similar result in a sample with 56 patients with a current SA. Patients with a previous history of SA had lower levels of reappraisal and higher levels of suppression than first-time attempters. On the other hand, Crespo-Delgado et al. (2020) found a negative association between emotional suppression and the number of psychiatric hospitalizations and between ER self-efficacy and the number of SA.

Research on general population samples has mostly explored ER processes. Overall, the studies showed that emotion dysregulation was positively related with SA, except Kranzler et al. (2016), where the scores of inabilities to engage in goal-directed behaviors and difficulties controlling impulsive behaviors (based on the DERS subscales) did not correlate with SA frequency.

Two studies compared between non-attempters, single attempters, and multiple suicide attempters. Miranda et al. (2013) found that individuals with multiple SAs reported significantly more difficulties controlling their behavior in response to negative emotions than non-attempters in a 2–3-year follow-up study. Also, Rajappa et al. (2011) showed that multiple attempters scored significantly higher on nonacceptance of

emotions compared with non-attempters. In addition, both studies reported that multiple and single attempters scored significantly higher on perceived limited access to strategies than individuals without a SA history.

Regarding ER strategies, studies mainly focused on cognitive reappraisal, expressive suppression, and rumination. Cognitive reappraisal was related to reduced suicidal behavior, but there was no relationship between SA and suppression (Ong & Thompson, 2018). In the same way, Gong et al. (2020) reported that cognitive reappraisal was lower in the students with suicidality, but no significant difference in suppression was found between students with and without suicidality. Conversely, Baek et al. (2016) showed that suicide attempters had a higher score for the suppression strategy in clinical and general population samples. Concerning rumination, brooding was higher in the SA group compared with the SI and non-suicidal groups (Cameron et al., 2017).

3.4 Emotion Regulation and Suicide Attempt in Adolescents

Six studies examined the relationship between ER and SA in adolescents (see Table 4). All of them used a cross-sectional design and they focused on ER processes: 3 examined clinical samples, 1 explored a general population sample, and 2 explored both clinical and general population samples.

Regarding clinical samples, the reviewed studies consistently reported a positive relationship between SA and emotion dysregulation. However, contrary to expectations, Preyde et al. (2014) found that youth who reported SA lifetime had significantly less difficulty with ER than youth who engaged in NSSI only or both NSSI and SA.

The association between emotion dysregulation and SA was also corroborated in general population samples. For students, those with limited access to effective strategies had an increased likelihood of reporting a SA. Furthermore, the association

between ER difficulties and SA was modestly lower among students who perceived having trusted adults in their families (Pisani et al., 2013).

Finally, 2 studies focused on ER processes assessed both clinical and general population samples. In a psychiatric community sample, adolescents with SA reported significantly greater emotion dysregulation than non-suicidal adolescents (Saffer et al., 2015). Furthermore, there were lower expectancies of ER in suicide attempters compared with a nonclinical control group (Orbach et al., 2007).

5. Discussion

In the present systematic review, we identified 76 relevant studies that examined the relationship between ER and suicide. We reviewed studies that examined both ER processes and strategies. Overall, these studies showed that ER, mainly the existence of difficulties regulating one's emotions, is associated with suicide behavior. Moreover, this general finding was consistent at all the studied ages (adolescents, young adults, and adults), type of sample (clinical and general population), and type of suicide behavior (ideation and attempt).

With regard to ER processes, most of studies focused on emotion dysregulation, assessing it though the DERS, which evaluates processes such as the lack of emotional awareness, lack of emotional clarity, nonacceptance of emotional responses, impulse control difficulties, difficulties engaging in goal-directed behavior, and the limited access to emotion. Studies with the DERS showed that emotion dysregulation was associated with SI and SA in all the ages and in both general population and clinical samples (regardless of the type of diagnosis: bipolar disorder, borderline personality disorder, eating disorder, alcohol dependence, depression, posttraumatic stress disorder), except 4 studies (Baer et al.,2018; Grandison et al., 2020; Kranzler et al., 2016; Silvers et al., 2016), which did not find significant relationships between emotion

dysregulation and SA. Although most studies examined the total DERS score, results were similar when examining specific processes through subscales (e.g. impulse control problems, expectancies about controlling emotions, emotional awareness). There were also similar results using others ER measures that are different from the DERS, like emotional or affective dysregulation, mood regulation, or expectancies of negative mood regulation, which were significantly associated with SI and SA. Overall, these results indicate that ER processes were associated with SI and SA in all the ages and in both clinical and general population samples.

Regarding ER strategies, all the reviewed studies were carried out with adults or young adults, except Quintana-Orts et al. (2020). Within adaptative strategies, the most investigated was cognitive reappraisal, which is the rethinking of stimuli or situations to change their meaning and emotional valence. Studies showed consistently that people who used this strategy reported lower levels of SI and SA. On the other hand, regarding maladaptive strategies, the most studied strategy was suppression. Contrary results were found, with a large part of studies reviewed (n=9) indicating that people with greater suicidal behavior showed increased efforts to suppress their expression of negative emotions, while four studies found a negative relationship between emotional suppression and suicidal behavior (Crespo-Delgado et al., 2020; Franz et al., 2021; Gong et al., 2020; Ong &Thompson, 2018). Other maladaptive strategies such as suppressing unwanted thoughts, inhibiting emotional experiences or rumination also presented moderate positive correlations with suicidal behavior. This result is consistent with others studies that have synthetized the findings about the associations between rumination and suicide (see Rogers & Joiner, 2017, for a meta-analytic review). Together, these results show that the use of adaptive and maladaptive strategies is associated with SI and SA.

Taken together, the results of the reviewed studies suggest that individual differences in ER could help researchers to understand why some people show SI or SA. The presence of difficulties in ER (e.g., lack of emotional clarity), a higher use of maladaptive strategies (e.g., emotional suppression, rumination), and a lower use of adaptive strategies (e.g., cognitive reappraisal) have been positively associated with suicide behavior. Leading models, such as the IPTS (Joiner, 2005) and the IMV (O'Connor, 2011) have contributed to improve our understanding about suicide; however, it is important to identify additional factors that explain it. Our findings suggest that these theorical models could benefit by including ER as an explanatory variable of suicide. The key variables of these models, such as perceived burdensomeness, thwarted belongingness, hopelessness or feeling of defeat, and entrapment, are all associated with the experience of higher levels of emotional distress. The capability to regulate these distressing emotions could be relevant to explain suicidal behavior. Moreover, given that our results show that ER is associated with both SI and SA, it is possible that ER plays a role throughout the entire process of suicide: first, in regulating negative feelings associated with perceived burdensomeness, belongingness, or hopelessness, and, finally, close to the SA. In this regard, it is possible that high emotion dysregulation is associated with a perception of a lack of control, which may be linked to the suicide crisis syndrome (SCS; Galynker et al., 2017) or acute suicidal affective disturbance (ASAD; Rogers et al., 2017), two acute suicidal diagnoses that have been proposed to explain the psychological processes that occur in the days, hours, and minutes leading up to a SA (Bagge et al., 2013; Deisenhammer et al., 2009).

4.1 Limitations and Future Research

A remarkable result of our review is that a few less than half of the studies reviewed have been published in the last 2 years. Considering this growing interest in

the field, it seems relevant to consider the following limitations of the literature. First, all the studies except six used a cross-sectional design, so more longitudinal research is required to examine whether initial levels of ER are predictive of changes in SI and/or SA over time. Second, most of the studies measuring ER employed the DERS, which focuses on specific processes (e.g. awareness, clarity, nonacceptance, impulse). Future studies must use other measures of ER processes (e.g., meta-emotional or meta-cognitions beliefs) that are also involved in ER (Trincas et al., 2016); this endeavor might expand our knowledge about ER processes involved in suicide. Third, studies with adolescents are more limited (we only identified one study with specific strategies; Quintana-Orts et al., 2020), and it is essential to know how individuals begin to regulate their emotions. Hence, it is necessary to extend the studies with this population. Last, most of the studies were carried out using females. Research about gender differences in suicide has shown that men complete suicide more frequently than females, while females engage significantly more frequently in SAs (Schrijvers et al., 2012). Thus, it is important to have a representative sample in terms of gender, because both genders are highly involved in suicide.

With respect to limitations of our systematic research, we must note that most of the included studies were focused on ER processes. This outcome may be partly related to our search strategy. We included general terms such as "emotion regulation," but not terms that refer to specific strategies (e.g., rumination). It is possible that we failed to detect studies examining some specific strategies, which did not include general terms about ER as a key word or in the title/abstract. Future reviews should include terms that refer to specific strategies in their search strategy. On the other hand, studies examining specific ER strategies are encouraged to included general terms as key words, such as "emotion regulation", to facilitate the searching process.

4.2 Implications

The clinical implications for these findings should be considered. ER has been included across models of internalizing psychopathology and treatment modalities, so it is involved as a transdiagnostic factor and it has demonstrated efficacy (Sakiris & Berle, 2019; Sloan et al., 2017). According to the relationship between ER and suicidal behavior, suicide intervention programs might benefit by including ER as a key target in these interventions. For example, Kiosses et al. (2018) have already proposed a psychosocial intervention targeting cognitive reappraisal to reduce suicide risk in middle-aged and older adults.

In sum, this review shows encouraging results about an important factor to consider regarding suicide behavior—the ER, both at a theoretical level, in psychological theories about suicide and at a practical level—to reduce the probability of suicide.

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* Indicates those studies that were included in the systematic review.

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Table 1. Suicide ideation in adults and young adults

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Clinical population (*n* = 11)							
Lynch, Cheavens, Morse, & Rosenthal (2004)	77 elderly depressed patients	Females: 62.3% Age: *M* = 69.51 *SD* = 6.16	ASIQ	WBSI	Suppression of unwanted thoughts Inhibit emotional experience and expression	Cross-sectional	The results showed moderated positive correlations between SI and attempts to suppress unwanted thoughts and inhibit emotional expression.
Forkmann et al. (2014)	232 inpatients with different mental disorders	Females: 69.4% Age: *M* = 37.5 *SD* = 13.4	Inpatients were asked to agree or disagree: "Sometimes I think about suicide."	ERQ	Cognitive reappraisal Expressive suppression	Cross-sectional	The results revealed that patients who reported SI showed significantly lower scores in cognitive reappraisal. There was a moderated positive relation between expressive suppression and SI. Patients who reported SI made greater efforts to suppress negative emotions.
Rogers & Joiner (2016)	169 outpatients at a university-based psychological clinic	Females: 62.7% Age: 18–71 *M* = 26.05 *SD* = 10.08	SSI	Three personality traits from the PID-5 The reassurance seeking subscale from DIRI-RS	Affective dysregulation	Cross-sectional	The relationship between affective dysregulation and SI was fully accounted for by perceived burdensomeness.
Rufino, Ellis, Clapp, Pearte, & Fowler (2017)	156 individuals with a diagnosis of borderline personality disorder 3 groups: Low impairment (*n* = 41) Global dysregulation (*n* = 69)	Females: 61.8% Age: 18–70 *M* = 29.43 *SD* = 11.48	C-SSRS	DERS	Emotion dysregulation	Cross-sectional	The global dysregulation group reported significantly higher SI than the low impairment or emotionally aware groups.

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
	Emotionally aware (*n* = 46)						
Rufino, Viswanath, Wagner, & Patriquin (2018)	432 psychiatric inpatients with eating disorders (ED)	Females: 78.2% Age: 18–65 *M* = 28.59 *SD* = 10.72	C-SSRS	DERS	Emotion dysregulation	Cross-sectional	Difficulty with ER was positively and significantly related to SI (passive ideation, active ideation, and ideation intensity). Furthermore, higher levels of body dissatisfaction in inpatients with ED were related to increased SI after controlling for depression and emotion dysregulation.
Azadi et al. (2019)	300 individuals with history of SA	Females: 66.7% Age: 14–62 M= 27.4 SD=9.00	BSSI	CERQ-Short	Adaptive and non-adaptive cognitive ER strategies	Cross-sectional	High behavioral inhibition system (neuropsychological system) was indirectly associated with current SI through high non-adaptive cognitive ER strategies.
Mohammadzadeh et al. (2019)	310 males with a diagnosis of heroin dependence	Males: 100% Age:15–65 M= 34.58 SD: 9.6	Not reported	DERS CERQ-Short	Emotion dysregulation Cognitive ER strategies	Cross-sectional	Perception of childhood trauma was indirectly associated with SI through some dimensions of ER difficulties: non-acceptance of emotional responses, limited access to ER strategies, lack of emotional awareness and the cognitive ER strategies of low positive reappraisal).
Orr et al. (2019)	431 opioid-using adults with chronic pain	Females: 74.60% Age: M= 38.98 SD= 11.23	Question 9 about the presence of SI from the BDI	DERS-16	Emotion dysregulation	Cross-sectional	Results indicated a significant indirect relationship between cannabis use problems, anxiety, depression and SIvia emotion dysregulation.

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Palagini, Cipollone, & Masci. (2019)	120 adults Two groups: Patients with bipolar disorder - II depressive episode with mixed features (*n* = 85) Healthy controls (*n* = 35)	Subjects with bipolar disorder: Females: 62.4% Age: *M* = 47.9 *SD* = 12.2 Healthy controls: Females: 63.8% Age: *M* = 48.4 *SD* = 13	SSI	DERS	Emotion dysregulation	Cross-sectional	The univariate analysis in subjects with bipolar disorder showed a positive correlation between suicidality and emotion dysregulation, especially to emotional impulsivity and to difficulties in regulatory strategies. The group of healthy controls showed no correlations. Subjects with bipolar disorder showed significantly higher scores in the DERS and the SSI total scores. In addition, emotion dysregulation played was a mediator for the association between social life dysrhythmicity and suicidality.
Palagini, Cipollone, & Moretto (2019)	77 subjects with bipolar disorder (BD) type II Two groups: Subjects with BD with insomnia *(n = 54)* Subjects with BD with no insomnia (*n* = 23)	Subjects with BD with insomnia Females: 62.3% Ages: *M* = 47.6 *SD* = 12 Subjects with BD with no insomnia Females: 63.8% Ages: *M* = 50.3 *SD* =13	SSI	DERS	Emotion dysregulation	Cross-sectional	The univariate analysis in subjects with bipolar disorder showed a positive correlation between suicidality and emotion dysregulation. In addition, emotional impulsivity mediated the association between insomnia symptoms and suicidality.
Raudales, Short & Schmidt (2019)	298 participants drawn from a randomized clinical trial with elevated suicide risk	Females: 54% Age: 18-79 *M*= 36.28 *SD*=16.11	BSSI SHF	DERS	Emotion dysregulation	Longitudinal (six months follow-up)	Elevated general emotion dysregulation (but not subscales) significantly predicted increases in SI at month-six follow-up after accounting for initial SI, negative affectivity and treatment condition. Furthermore, general emotion dysregulation, as well as lack of awareness and clarity subscales, were significantly associated with prior SA at baseline after accounting for negative affectivity.
General population (*n* = 16)							
Khurana & Romer (2012)	710 youths	Males: 51% Age: *M* = 18	Item taken from the YRBS: "How often, if ever, have you	RSQ	Emotional control/self-regulation	Longitudinal (1-year follow-up)	ER predicted a reduction in SI among both males and females. However, the effect of ER was channeled through its use at follow-up and was mediated by reductions in

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
		SD=2.3	seriously considered attempting suicide?"				depressive symptoms and perceived stress, leading to reduced SI.
Tucker et al. (2016)	131 undergraduates	Female: 74.8% Age: 18–53 *M* = 19.70	Suicidality subscale from the HDSQ-SS	Affective dysregulation subscale of the FFBI	Affective dysregulation	Cross-sectional	Affective dysregulation positively and significantly correlated with SI. Bootstrapping analyses indicated that subscales of the FFBI (affect dysregulation) had indirect effects on SI through increased anxiety sensitivity cognitive concerns (ASCC)
Cheung, Chan & Au (2018)	422 Hong Kong undergraduates	Age:18-38 M= 20.70 SD= 2.63	SPS	Emotional regulation subscale from FDCS	Emotion regulation	Cross-sectional	ER coping and SI had no significant relationship.
Mayorga et al. (2018)	448 Latino/a college students	Females: 78.3% Age: 18–25 *M* = 20.67 *SD* = 1.96	Subscale suicidality from the IDAS	DERS	Emotion dysregulation	Cross-sectional	The results revealed that the correlation among emotion dysregulation and suicidality was positive and significantly high. In addition, there was an indirect effect of acculturative stress via difficulties in ER on suicidality symptoms among men and women.
Amazue et al. (2019)	473 nursing undergraduates	Females: 86.7% Age: 18-38 M = 24.5 SD =3.0	SIDAS	ERQ	Cognitive reappraisal Expressive suppression	Cross-sectional	High cognitive reappraisal attenuates the positive relationship between mental pain and SI, while high expressive suppression potentiates the positive relationship between mental pain and SI.
Decker et al. (2019)	278 army veterans recruited in a survey study	Males: 70.6% Age: M= 20.26 SD= 18.5	C-SSRS	DERS	Emotion dysregulation	Cross-sectional	Emotion dysregulation was associated with SI during the past three months and lifetime SA.

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Flores-Kanter et al. (2019)	2164 Argentines	Females: 72.1% Age: <19- >60	Item: “In order to stop things getting worse, I believe suicide is the solution" from ISO-30	CERQ	Cognitive ER strategies	Cross-sectional	Cognitive ER strategies (rumination and catastrophizing) had a larger contribution to SI.
Knorr et al. (2019)	1178 college students with NSSI history No history of STBs *(n=288)* SI *(n=386)* Suicide plan *(n=237)* SA *(n=154)*	Females: 68.70% Age:18–35 M = 20.63 SD = 2.73	SBQ-R	DERS	Emotion dysregulation	Cross-sectional	Greater difficulties in impulse control and more limited access to ER strategies distinguished those with greater suicidal thoughts and behavior. Conversely, there was no significant difference in reported DERS awareness scores across groups.
Lemaigre & Taylor (2019)	86 adult men recruited from the Men’s Suicide, Harm, Awareness, Recovery and Empathy (SHARE) Project	Males: 100% Age:18–69 *M* = 41.9 *SD* = 12.10	SBQ-R	DERS	Emotion dysregulation	Cross-sectional	There was a significant positive correlation between emotion dysregulation and suicidality (lifetime suicide ideation, frequency of suicidal ideation over the past year, threat of suicide attempt, and likelihood of future suicidality). In addition, emotion dysregulation significantly mediated the relationship between childhood trauma and suicidality.
Ortiz et al. (2019)	214 adults	Males: 55.60% Age: 18-72 M=33.27 SD = 10.75	DSI-SS	ERQ	Cognitive reappraisal Expressive suppression	Cross-sectional	Expressive suppression mediated the relation between disordered eating symptoms and current SI. However, no relationship was found for cognitive reappraisal.
Gómez-Romero et al. (2020)	350 undergraduates	Females: 71.4% Age:17- 28 M= 21.13 SD= 6.15	SBQ-R	ER subscale from TMMS	Emotional regulation	Cross-sectional	Participants with higher ER levels showed lower levels of suicidal behavior (SI and SA) and academic procrastination.

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
McLafferty et al. (2020)	739 first year undergraduate students	Females: 62.51% Age: 18- 49 M = 20.69 SD = 5.313	Items from SITBI	ERQ	Cognitive reappraisal Expressive suppression	Cross-sectional	Adaptive ER strategies were associated with lower levels of suicidal behaviour. Also, suppression mediated positively the association between parental over-control and a range of psychological disorders and suicidal behaviour.
Raudales et al. (2020)	465 trauma-exposed military veterans recruited from an internet-based crowdsourcing platform	Males: 71.4% Age: 18-76 M= 38.00 SD = 11.45	SBQ-R	DERS-16 DERS-P	Negative and positive emotion dysregulation	Cross-sectional	Results showed significant interactive effects of posttraumatic stress disorder rsymptoms and positive emotion dysregulation (nonacceptance of positive emotions, difficulties engaging in goal-directed behaviors when experiencing positive emotions, and difficulties controlling impulsive behaviors when experiencing positive emotions) on suicidal thoughts and behaviors (STBs). PTSD symptoms were more strongly related to STBs at high levels of positive emotion dysregulation.
Zeifman, Antony & Kuo (2020)	130 undergraduates	Females: 83.07% Age:17-57 M= 21.04 SD= 6.30	BSSI	DERS	Emotion dysregulation	Cross-sectional	Emotion dysregulation (specifically emotional clarity and access to ER strategies) accounted for the positive relationships between perfectionistic concerns and perfectionistic strivings and SI.
Douglas, Kwan & Gordon (2021)	156 undergraduates	Females: 74.4 % Age:18-33	SBQ-R	DERS	Emotion dysregulation	Cross-sectional	It was found an indirect effect of weight stigmatization on suicide risk through emotional dysregulation. Higher weight stigmatization was associated with higher emotional dysregulation, which was associated with higher suicide risk.
Franz, Kleiman & Nock (2021)	46 adults who had SA recruited from online forums related to suicide	Females: 78.2% Age:18-38 M= 23.40 SD= 4.36	Each night, participants answered three questions from BSSI	ERQ	Cognitive reappraisal Expressive suppression	Cross-sectional	Higher levels of reappraisal and suppression were associated with less stress and SI.

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Clinical and general population (*n* = 1) Ponzoni et al. (2021)	Two groups: 70 subjects recruited in mental health services 154 adults recruited through a snowball sampling	Clinical sample: Females: 55.9% Age: M= 35.18 SD= 15.62 Control group: Females:58.8% Age: M= 27.41 SD= 12.17	BSSI	DERS	Emotion dysregulation	Cross-sectional	BSSI scores correlated significantly with all DERS dimensions, apart from awareness. Emotion dysregulation moderated the relationship between vulnerable narcissism and SI.

Note. ER = emotion regulation; SI = suicide ideation; ASIQ = Adult Suicide Ideation Questionnaire; BDI= Beck´s Depression Inventory; BSSI= Beck Scale for Suicidal Ideation; CERQ = Cognitive Emotion Regulation Questionnaire; CERQ-Short= Cognitive Emotion Regulation Questionnaire-Short versión; C-SSRS = Columbia-Suicide Severity Rating Scale; DERS = Difficulties in Emotion Regulation Scale; DERS-P= Difficulties in Emotion Regulation Scale-Positive; DIRI-RS = Depressive Interpersonal Relationships Inventory; DSI-SS= Depressive Symptom Inventory Suicidality Subscale; ERQ = Emotion Regulation Questionnaire; FDCS= The Functional Dimensions of Coping Scale; FFBI = Five-Factor Borderline Inventory; HDSQ-SS = Hopelessness-Depression Symptom Questionnaire – Suicidality Subscale; ISO – 30= Inventory of Suicide Orientation ; IDAS = Inventory of Depression and Anxiety Symptoms; PID-5 = Personality Inventory for DSM-5; RSQ = Response to Stress Questionnaire; SBQ-R= Suicide Behaviors Questionnaire–Revised; SHF= Suicide History Form; SIDAS=The Suicidal Ideation Attributes Scale; SPS= Suicide Probability Scale; SSI= Scale for Suicide Ideation; TMMS= Trait Meta Mood Scale; WBSI = White Bear Suppression Inventory; YRBS = Youth Risk Behavior Survey.

Table 2. Suicide ideation in adolescents

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Clinical population (*n* = 3) O'Neil Rodriguez & Kendall (2013)	86 anxiety-disordered youth	Males: 52.3% Age 7–17 *M* = 11.50 *SD* = 3.09	SIQ-JR	Dysregulated expression subscale from the CEMS	Emotion dysregulation	Cross-sectional	In univariate analyses, the youth self-report on the CEMS of more severe emotion dysregulation was positively and significantly correlated with higher levels of SI after controlling for depressive symptomatology. However, in a multivariate analysis, only anxiety symptomatology was associated with SI.
Eaddy et al. (2018)	151 adolescents from an inpatient psychiatry unit	Females: 82.1% Age: 12–17 *M* = 15.1 *SD* = 1.41	CHRT SR	DERS	Emotion dysregulation	Cross-sectional	Emotion dysregulation correlated positively with suicide risk. Furthermore, the relationship between emotion dysregulation and suicide risk was accounted for by perceived burdensomeness, capability for suicide, and depression severity.
Viana et al. (2018)	50 psychiatric inpatient adolescents	Females: 52% Ages:12–17 *M* = 15.1 *SD* = 0.51	An item from M-YRBS "Have you ever tried to kill yourself"?	The emotional clarity subscale from the DERS	Emotional clarity	Cross-sectional	There was a positive relationship between low emotional clarity and SI and it was significant among trauma-exposed adolescents with high levels of distress tolerance.
General population (*n* = 6) Weinberg & Klonsky (2009)	428 adolescents at a high school	Females: 61% Age: 13-17	PHQ–A	DERS	Emotion dysregulation	Cross-sectional	The DERS scores exhibited robust positive correlations with SI.
Khanipour, Hakim Shooshtari, & Bidaki (2015)	169 adolescents with a history of childhood maltreatment Three groups: NSSI only (*n* = 69) NSSI + SA (*n* = 52) SA only (*n* = 48)	Females: 69% Age: 12–18 *M* = 14.23	SPS	DERS	Emotion dysregulation	Cross sectional	All DERS subscales (except the awareness subscale) correlated positively with SI. However, in the regression model, only impulse control problems remained a significant association with SI.

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Sajadi, Arshadi, Zargar, Honarmand, & Hajjari (2015)	300 students from the high schools	Females: 50% Age: 14–18 *M* = 15.72 *SD* = 0.99	SSI	DERS	Emotion dysregulation	Cross-sectional	Emotion dysregulation showed a moderated positive correlation with SI.
Quintana-Orts et al. (2020)	Study 1: 1824 students Study 2: 796 Spanish high school students	Study 1: Females: 52.4% Age:12-17 M = 14.55 SD = 1.67 Study 2: Females:54.4% Age: 12–17 M = 13.76 SD = 1.31	FSII	WLEIS CERQ	Cognitive ER strategies	Study 1: Cross-sectional Study 2: Longitudinal (4-month follow-up)	Adaptive cognitive ER strategies partially mediated the link between emotional intelligence (EI) and SI both cross-sectionally and prospectively.
Singh & Pathak (2020)	200 students adolescents Three groups: High ER *(n=65)* Moderate ER *(n=95)* Low ER *(n=40)*	Age: 13.5-19.5 M= 6.36	SIS	ERQ	Emotional regulation	Cross-sectional	The high ER group obtained the lowest mean score on SI scale in comparison to moderate and low ER groups.
Swee et al. (2020)	1699 adolescents and young adults	Females: 63.6% Age: 16-25 M = 20.24 SD = 2.45	Question: "Did you think about suicide in the past month?"	REQ	Emotional regulation	Cross-sectional	All ER factors except external dysfunctional were associated with SI. Both internal and external functional ER were negatively related to SI, while internal dysfunctional ER exhibited a positive relationship. Belongingness mediated the association between the most ER domains and SI.
Clinical and general population (n=1)							

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Conner et al. (2020)	330 autism spectrum disorder (ASD) inpatient, 1169 community youth with ASD surveyed online, and 1000 youth representative of the US census	ASD Inpatient Males: 78.8% Age: M= 13.19 SD=3.37 ASD Community online Males: 79.8% Age: M= 12.04 SD=3.19 US census Males: 50.6% Age: M= 12.05 SD=3.55	Item 91 from CBCL	EDI	Emotion dysregulation	Cross-sectional	In the ASD groups, greater emotion dysregulation was associated with SI.

Note. NSSI = non-suicidal self-injury; SA = suicide attempt; SI = suicide ideation; CBCL= Child Behavior Checklist; CEMS = Children's Emotion Management Scales; CERQ = Cognitive Emotion Regulation Questionnaire; CHRT SR = Concise Health Risk Tracking Scale Self-Report; DERS = Difficulties in Emotion Regulation Scale; EDI= Emotion Dysregulation Inventory; ERQ = Emotion Regulation Questionnaire; FSII= Frequency of Suicidal Ideation Inventory; M-YRBS = Modified Youth Risk Behavior Survey; PHQ–A = Patient Health Questionnaire-Adolescent; REQ= Regulation of Emotion Questionnaire; SIQ-JR = Suicidal Ideation Questionnaire-Junior; SIS= Suicidal Ideation Scale; SPS = Suicide Probability Scale; SSI = Scale for Suicide Ideation; WLEIS= Wong and Law Emotional Intelligence Scale.

Table 3. Suicide attempt in adults and young adults

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Clinical population (*n* = 15) Marquart, Overholser, & Peak (2009)	137 adult psychiatric inpatients Three groups: Depressed recent attempters (*n* = 48) Depressed past attempters (*n* = 38) Depressed never attempters (*n* = 51)	Females: 67.9% Age: 18–73	SSI	Affect regulation subscale from the NMR	Affect regulation	Cross-sectional	Suicide risk was negatively and significantly related to patients' expectations regarding their ability to control negative moods. Depressed non-attempters, past attempters, and recent attempters reported similarly low levels of confidence in the ability to regulate mood, although in non-attempters it was slightly higher.
Gómez-Expósito et al. (2016)	122 adult female bulimic spectrum disorder (BSD) patients Three groups: Patients with BSD only (n = 57) BSD with SA (n = 37) BSD with NSSI (n = 28)	Females: 100% Age: *M* = 28.57 *SD* = 9.45	The question "Have you ever attempted suicide (with lethal intentionality)?"	DERS	Emotion dysregulation	Cross-sectional	Patients with BSD in the SA group scored higher than the BSD only group in almost all of the DERS subscales, except for the lack of emotional awareness subscale.
Silvers et al. (2016)	60 individuals with borderline personality disorder (BPD) Two groups: Attempters (*n* = 46) Non-attempters (*n* = 14)	Females: 100% Attempters *M* = 28.9 *SD* = 9.81 Non-attempters *M* = 26.71 *SD* = 5.00	CSHF	DERS	Emotion dysregulation	Cross-sectional	The results revealed no significant differences in DERS scores between attempters and non-attempters. However, they showed different neural activation.
Wang, Weiss, Pachankis, & Link (2016)	184 participants who had experienced recent psychiatric hospitalizations	Males: 59.1% *M* = 37.0 *SD* = 10	Items from the YRBS	TAS-20	Emotional clarity	Cross-sectional	Emotional clarity correlated positively with suicide risk. Further, the relationship between perceived mental illness stigma and suicide risk severity approached

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
							significance when deficits in emotional clarity were high.
Martin, Vujanovic, & Day (2017)	128 adults from an acute-care psychiatric inpatient setting with a history of exposure to trauma	Females: 42.6% Age: *M* = 33.83 *SD* = 11.19	BSSI	DERS	Emotion dysregulation	Cross-sectional	Individuals with greater difficulties in ER were significantly more likely to be admitted for current inpatient hospitalization due to SI and/or SA.
Vasudeva & Singh (2017)	56 patients with a current SA Two groups: With past SA Without past SA	Females: 57% Age: 18–60 *M* = 25	Not measured (patients with a current SA were approached to participate in the study after they were clinically stable)	ERQ	Emotional suppression Cognitive reappraisal	Cross-sectional	Patients with a previous history of SA had a higher mean suppression score and a lower reappraisal score than first-time attempters.
Baer et al. (2018)	186 military psychiatric adult inpatients Two groups: Single attempts (*n* = 55) Multiple attempts (*n* = 131)	Single attempts: Males: 56.36% Age: *M* = 30.64 *SD* = 9.31 Multiple attempts: Males: 67.94% Age: *M* = 29.03 *SD* = 8.58	Items from the C-SSRS	DERS	Emotion dysregulation	Cross-sectional	Multiple SAs and SI severity was not associated with DERS components. None of the DERS subscales significantly differentiated between individuals with single versus multiple attempts in multiple logistic regression analyses.
Harris, Chelminski, Dalrymple, Morgan, & Zimmerman (2018)	1046 psychiatric outpatients Two groups: Attempters (*n* = 160) Non-attempters (*n* = 886)	Attempters: Females: 68.8% Age: *M* = 37.6 *SD* = 13.0 Non-attempters: Females: 55.3% Age:	Interview about suicide history	DERS	Emotion dysregulation	Cross-sectional	Individuals with SA had significantly higher scores for the DERS (total) and the subscales of impulse, goals, and limited access to strategies. However, after controlling for age, gender, level of education, and 11 psychiatric diagnoses, the total DERS scores were not independently associated with having made a SA. Furthermore, DERS domains

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
		M = 40.2 *SD* = 14.5					were not significant predictors of past suicidal behavior.
Kopera et al. (2018)	80 alcohol-dependent patients Two groups: Patients with a lifetime history of SA (*n* = 20) Patients without a history of SA (*n* = 60)	Patients with a lifetime history of SA Males: 60% Age: *M* = 41.20 *SD* = 10.29 Patients without a history of SA Males: 73% Age: *M* = 45.78 *SD* = 10.29	The question "During your lifetime, have you ever tried to commit suicide?" from the MINI	Mood regulation subscale of the SSEIT	Mood regulation	Cross-sectional	ANOVA analysis revealed that individuals with a positive history of SA showed lower self-reported mood regulation than individuals without SA. Mood regulation fully mediated the relationship between depression and SA and between neuroticism and SA
Mallorquí-Bagué et al. (2018)	249 adult patients with gambling disorder Sample (*n* = 249) SI present (*n* =83) SI absent (*n* = 166) Subsample with SI (*n* = 83): SA present (*n* =14) SA absent (*n* = 69)	Males: 91.97% Age: *M* = 40.25 *SD* =12.82	In a face-to-face interview about past, recent, and present SA	DERS ERQ	Emotion dysregulation Emotional suppression Cognitive reappraisal	Cross-sectional	Individuals with SI had significantly higher total DERS scores than the non-SI group. In those with presence SI and SA, scores of DERS were slightly higher than only presence SI. In addition, patients with SI and attempt had higher scores for the suppression scale and lower reappraisal scores than patients with SI but not SA.
Crespo-Delgado, Suso-Ribera & García-Palacios (2020)	88 females attending a private clinical center for the treatment of BPD	Females: 100% Age: 16-55 M=28.69 SD= 8.85	The lifetime history of SA was obtained from the electronic clinical record	ERQ GSE	Emotional suppression Cognitive reappraisal ER self-efficacy	Cross-sectional	In patients with BPD it was found a negative association between emotional suppression and the number of psychiatric hospitalizations and a negative association between self-efficacy and the number of SA.

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Grandison et al. (2020)	113 adults seeking treatment for psychological trauma	Females: 95.7% Age:19-62 M= 38.24 SD= 10.856	Single item: "Have you tried to hurt or kill yourself or threatened to do so?"	DERS	Impulse control difficulties Limited access to ER strategies	Cross-sectional	Neither difficulties in impulse control, nor limited access to regulation strategies, were significantly higher among those with a suicidal history than those without.
Kuehn et al. (2020)	97 women with criteria for BPD	Females: 100% Age: 18-60	SASSI	DERS	Emotion dysregulation	Longitudinal (four-month intervals throughout one year of treatment and one year of follow-up)	Less access to ER strategies were significantly associated with SA during and in the year after Dialectical Behavior Therapy (DBT).
Rania et al. (2020)	2406 patients with eating disorders (ED), 1557 adults and 848 adolescents using registry data	Age: 13-72 M = 22.5 SD = 8.6	Suicidality was extracted from a registry for ED. It was recorded using the question "Has the patient ever attempted suicide?"	DERS	Emotion dysregulation	Cross-sectional and Longitudinal 1-year follow-up in a subset of the sample (n=406)	DERS scores was associated with SA and SI even when adjusting for ED psychopathology and current depression. Perceived lack of ER strategies showed unique associations with SA and SI, both in the total sample and in most ED subtypes.
Rufino et al. (2020)	2683 psychiatric inpatients	Females: 52.5% Age: 18-81 M = 34.35 SD = 14.70	Participants were asked if they had made a SA in their lifetime.	DERS	Emotion regulation difficulties	Cross-sectional	The relationship between ER difficulties and previous SA was significant. Also, the association between nightmare frequency and SA was strongest at higher levels of ER difficulties.

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
General population (*n* = 14) Rajappa, Gallagher, & Miranda (2012)	96 undergraduates from a public university Four groups: Control (*n* = 42) Ideators (*n* =17) Single attempters (*n* = 20) Multiple attempters (*n* = 17)	Females: 76.04% Age: 18–30 *M* = 19 *SD* = 2.2	SBS	DERS	Emotion dysregulation	Cross-sectional	Bonferroni-corrected post hoc comparisons revealed that multiple attempters scored significantly higher on nonacceptance than controls and both multiple and single attempters scored significantly higher on perceived limited access to strategies than controls.
Miranda, Tsypes, Gallagher, & Rajappa (2013)	143 young adults recruited from a public university Three groups: Multiple suicide attempters (*n* = 15) Single attempters (*n* = 17) Non-attempters (*n* = 111)	Females: 80 % Age:18–25 *M* = 18.5 *SD* = 1.10	The question "Have you ever, in your whole life, tried to kill yourself or made a suicide attempt?"	DERS	Emotion dysregulation	Longitudinal (2–3-year follow-up)	Subjects with multiple SAs reported significantly more difficulty controlling their behavior in response to negative emotions (impulse) than non-attempters. Single and multiple attempters reported significantly more difficulty accessing ER strategies than those without a SA history.
Shelef, Fruchter, Mann, & Yacobi (2014)	103 soldiers from military service Three groups: SA (*n* = 32) Non-suicidal psychologically treated peers (*n* = 38) Controls (*n* = 33)	Males: 64% Age: *M* = 19.7 *SD* = 0.99	SSI	NMR	Emotion dysregulation	Cross-sectional	The SA group had lower ER than non-suicidal psychologically treated peers and the control group.
Ammermana, Kleiman, Uyeji, Knorr, & McCloskey (2015)	2295 undergraduates Two groups: SA (*n* = 108) No SA (*n* = 2177)	Females: 61% Age: 18–57 *M* = 20.94 *SD* = 3.42	The item "I have attempted to kill myself, and really hoped to die" from the SBQ-R	DERS	Emotion dysregulation	Cross-sectional	SA individuals reported higher levels of emotion dysregulation, compared with those without SA. Furthermore, emotion dysregulation served as a mediator in the relationship between trait anger and SA

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Powers, Stevens, Fani, & Bradley (2015)	Adults recruited from primary care clinics of an urban public hospital Study 1 (*n* = 128) Study 2 (*n* = 2197) Study 3 (*n* = 446)	Sample 1 Females: 74.2% Age: *M* = 42.6 *SD* = 12.3 Sample 2 Females: 70% Age: *M* = 39.2 *SD* = 13.5 Sample 3 Females: 61% Age: *M* = 42.9 *SD* = 13.1	Participants were asked to self-report any history of SA	EDS-short DERS	Emotion dysregulation	Cross-sectional	Emotion dysregulation was significantly and positively related to the number of lifetimes SAs; the EDS-short scale added significant incremental validity in predicting the number of reported SAs.
Kranzler, Fehling, Anestis, & Selby (2016)	148 undergraduates	Females: 70.9% Age: 18–57 *M* = 21.48 *SD* = 4.85	L-SASI	Impulsivity and goal subscales from the DERS	Inability to engage in goal-directed behaviors Difficulties controlling impulsive behaviors	Cross-sectional	The impulsivity and goal subscale scores were not correlated with SA frequency, but emotion dysregulation was indirectly associated with SA frequency via internalizing symptoms and NSSI frequency.
Barr, Fulginiti, Rhoades, & Rice (2017)	398 homeless youth and young adults	Males: 70.98% Age: 13–28 *M* = 21.38 *SD* = 2.08	Question "In the past year, how many times did you attempt suicide?"	Awareness and impulsivity subscales from the DERS	Emotional awareness Emotional control	Cross-sectional	The results of the logistic regression analyses showed that emotional awareness and emotional control had significant negative associations with SA.
Gómez-Romero, Limonero, Toro, Montes-Hidalgo, & Tomás-Sábado (2018)	144 university students	Females: 72.2% *M* = 17.94 SD = 0.269	SRS	TMMS	Emotion regulation Emotional clarity Emotional attention	Cross-sectional	A high risk of suicide was associated with lower levels of clarity and ER. There were no differences regarding emotional attention.

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Ong & Thompson (2018)	120 undergraduate students from a Hong Kong university	Females: 57.5% Age: 18–28 *M* =23.14 *SD* =5.51	SBQ-R	ERQ	Emotional suppression Cognitive reappraisal	Cross-sectional	Increased use of cognitive reappraisal was related to reduced suicidal behavior. However, there was no relationship between suicide and expressive suppression.
Fadoir, Lutz-Zois & Goodnight (2019)	28 offenders of a jail	Females: 50.87% Age: 18-70 M = 33.73 SD= 10.88	SBQ-R	DERS RRS	Emotion dysregulation Rumination	Cross-sectional	The association between secondary psychopathy and future suicidal intention was best explained by the indirect path of emotion dysregulation, rumination, recent SI and non-suicidal self-injury (NSSI).
Chang, Fehling & Selby (2020)	388 adults recruited both in-person (n =216) and online (n = 172)	Females: 64% Age: 18-64 M = 25.41 SD= 9.36	Item asking: "Have you ever in your life hurt yourself on purpose with the hope that you would die as a result?"	DERS	Emotion dysregulation	Cross-sectional	ER difficulties were directly related to prior SA. Also, ER mediated the relationship between sexual minority status and SA.
Gong et al. (2020)	2457 students of first-year college	Females: 63.5% Age: M=18.54 SD=0.98	Three questions: (1) Have you ever thought about suicide? (2) Have you ever made a suicide plan? and (3) Have you ever attempted to kill yourself?	ERQ	Cognitive reappraisal Expressive suppression	Cross-sectional	The cognitive reappraisal score was lower in the students with suicidality than the students without suicidality. However, no significant difference in the suppression scores was found between the participants with and without suicidality. Moreover, cognitive reappraisal had a significant mediating effect on the association between schizotypal personality traits and suicidality.
Spitzen, Tull & Gratz (2020)	364 participants from the community who completed online measures through an internet-based platform	Females: 59.6% Age: 21-65 M = 38.81 SD = 11.62	MEPOS	RESE EAQ	ER self-efficacy	Cross-sectional	Low ER self-efficacy was associated positively with history of SA, recent NSSI, and current severity of SI both directly and indirectly through avoidance of negative emotions.

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Yang et al. (2021)	1596 Chinese undergraduates 3 groups: Non-ideators *(n=1289)* Suicide ideators *(n=278)* Suicide attempters *(n=29*	Males: 79% Age: 18-35 M= 20.98 SD= 2.88	Single item derived from the BSSI Chinese Version One item derived from the SITBI	DERS	Emotion dysregulation	Cross-sectional	Suicide attempters reported greater difficulties in emotion dysregulation, especially for controlling impulses of negative emotions and emotional awareness, compared to suicide ideators. Compared to non-ideators, suicide ideators reported greater difficulties in emotion dysregulation, especially for ER strategies and emotional clarity.
Clinical and general population (*n* = 3) Baek et al. (2017)	167 individuals Three groups: Depressed patients with a SA history (*n* = 45) Non-suicidal depressed patients (*n* = 47) Healthy controls (*n* = 75)	Healthy controls Males: 61% Age: *M* = 25.4 *SD* = 4.6 Non-suicidal depressed patients Males: 47% Age: *M* = 26.8 *SD* = 6.3 Suicide attempters Males: 53% Age: *M* = 24.5 *SD* = 5.9	BSSI	ERQ	Emotional suppression Cognitive reappraisal	Cross-sectional	The suicide attempters had a higher score for the suppression strategy and a lower score for the reappraisal strategy compared with the non-suicidal depressed patients.
Cameron, Brown, Dritschel, Power, & Cook (2017)	199 participants: The never-suicidal (NS) and SI groups were recruited from local communities and university bulletins. The SA group was recruited from an Accident and Emergency department (NHS Tayside)	Males: 52% Age: 18–55	Patients recruited from an Accident and Emergency department (NHS Tayside) within 24 hours of admission following a probable SA	RRS	Rumination: brooding	Cross-sectional	Brooding was higher in the SA group compared with the SI and NS groups; brooding was higher in the SI compared with the NS group.

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
	Three groups: NS (*n* = 90) SI (*n* = 26) SA (*n* = 83)						
Neacsiu, Fang, Rodriguez, & Rosenthal (2018)	Study 2: 95 participants recruited in a southeastern urban area from outpatient/inpatient clinics and from the community using flyers and online ads Three groups: Healthy controls (*n* = 44) Depressed controls who had never attempted suicide (*n* = 24) Depressed attempters who had a lifetime history of SA (*n* = 27)	Females: 63.2% Age: *M* = 35.34 *SD* = 12.77	SASII	DERS	Emotion dysregulation	Cross-sectional	The DERS total scores were significantly higher in depressed attempters than healthy controls. Specifically, attempters reported more difficulties with emotional impulsivity and emotional clarity. Comparing depressed never attempters and depressed attempters, the DERS total scores were higher in attempters.

Note. ANOVA = analysis of variance; ER = emotion regulation; NSSI = non-suicidal self-injury; SA = suicide attempt; SI = suicide ideation; BSSI = Beck Scale for Suicide Ideation; CSHF = Columbia Suicide History Form; C-SSRS = Columbia-Suicide Severity Rating Scale; DERS = Difficulties in Emotion Regulation Scale; EAQ= Emotional Avoidance Questionnaire; EDS-short = Emotion Dysregulation Scale, short version; ERQ = Emotion Regulation Questionnaire; GSE= General Self-Efficacy Scale*;* L-SASI = Lifetime-Suicide Attempts Self-Injury; MEPOS= Measure of Episodic Planning of Suicide; MINI = International Neuropsychiatric Interview; NESARC = National Epidemiologic Survey of Alcohol and Related Conditions; NMR = Negative Mood Regulation scale; RESE= Regulatory Emotional Self-Efficacy Scale; RRS = Ruminative Responses Scale; SASII = Suicide Attempt Self-Injury Interview; SBQ-R = Suicidal Behaviors Questionnaire–Revised; SBS = Suicidal Behavior Screening; SITBI= Self-Injurious Thoughts and Behaviors Interview; SRS = Plutchik Suicide Risk Scale; SSEIT = Schutte Self-Report Emotional Intelligence Test; SSI = Scale for Suicide Ideation; TAS-20 = Toronto Alexithymia Scale; TMMS = Trait Meta Mood Scale; YRBS = Youth Risk Behaviour Survey.

Table 4. Suicide attempt in adolescents

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
Clinical population (*n* = 3) Brown et al. (2012)	417 adolescents recruited from therapeutic school	Females: 30% Age: *M* = 15.25 *SD* = 1.47	A question about whether they had ever attempted suicide	Items with modifications suggested by the SIDES	Affect regulation	Cross-sectional	Adolescents who reported SA had more difficulties with ER.
Preyde, Vanderkooy, Chevalier, & Heintzman (2014)	123 children and adolescents admitted to an in-patient psychiatric unit Three groups: NSSI only (*n* = 25–28) NSSI + SA (*n* = 61–65) Suicide attempt (*n* = 11)	Females: 74.38% Age: 14–18 *M* = 15.74 *SD* = 1.51	Not reported	DERS	Emotion dysregulation	Cross-sectional	Youth who reported SA had significantly less difficulty with ER than youth who engaged in NSSI only or both NSSI and SA.
Hatkevich, Penner, & Sharp (2019)	547 psychiatric adolescents Inpatients	Females: 63.4% Age: *M* = 15.36 *SD* = 1.44	The question "Have you ever, in your whole life, tried to kill yourself or made a suicide attempt?" from the CDISC	DERS	Emotion dysregulation	Cross-sectional	Inpatients who reported a SA as a reason for admission experienced significantly greater differences on the DERS awareness, nonacceptance, and strategies subscales, relative to those who did not report a SA. In addition, there was a significant positive relation between perceived limited access to effective regulation strategies and SI.
General population (*n* = 1) Pisani et al. (2013)	7978 high-school students	Males: 51.1%	An item from the YRBS: "During the past 12 months, how many times, did you actually	Subscales lack of emotional clarity and limited access to strategies for emotion regulation from the DERS	The lack of emotional clarity Limited emotion regulation	Cross-sectional	Students who had limited access to effective strategies for responding to emotional distress had an increased likelihood of reporting a SA across all models. Lacking emotional clarity was associated with SA in univariate models;

Study	Participants	Gender and age	Suicidality measure	ER measure	ER process/ strategies	Design	Results
			attempt suicide?"		strategies		however, when examined together with the other dimension of emotion regulation, it was not associated independently with attempts.
Clinical and general population (*n* = 2) Saffer, Glenn, & Klonsky (2015)	Sample 1: 172 adolescent psychiatric patients Sample 2: 413 adolescents attending high school	Sample 1 Females: 77% Age: *M* = 15.04 *SD* = 1.39 Sample 2 Females: 61% Age: 13–17	The item "Have you ever tried to kill yourself?" from the YRBS	DERS	Emotion dysregulation	Cross-sectional	Psychiatric sample: Suicide attempters reported significantly greater emotion dysregulation than non-suicidal participants. Community sample: Adolescents with SA reported significantly greater emotion dysregulation than non-suicidal adolescents.
Orbach et al. (2007)	154 adolescents recruited from mental health centers (clinical groups) and friends or the same high schools of the clinical groups (control group) Three groups: Suicidal inpatients (*n* = 43) Non-suicidal inpatients (*n* =35) Non-clinical control group (*n* = 78)	Suicidal inpatients Females: 65% Non-suicidal inpatients Females: 54% Nonclinical control group Females: 61% Age: 15–18 *M* = 17.2 *SD* = 1.4	SIQ	NMR	Expectancies of negative mood regulation	Cross-sectional	Suicidal and non-suicidal inpatients scored lower in expectancies of negative mood regulation than controls. Among suicidal and non-suicidal inpatients, the expectancies of mood regulation were higher in the non-suicidal group. Furthermore, lower expectancies of ER were significantly associated with more frequent SI.

Note. ER = emotion regulation; NSSI = non-suicidal self-injury; SA = suicide attempt; CDISC = Computerized Diagnostic Interview Schedule for Children*;* DERS = Difficulties in Emotion Regulation Scale*;* M-YRBS = Modified Youth Risk Behavior Survey*;* NMR = Negative Mood Regulation scale; SIDES = Structured Interview for Disorders of Extreme Stress*;* SIQ= Suicidal Ideation Questionnaire*;* YRBS = Youth Risk Behavior Survey.

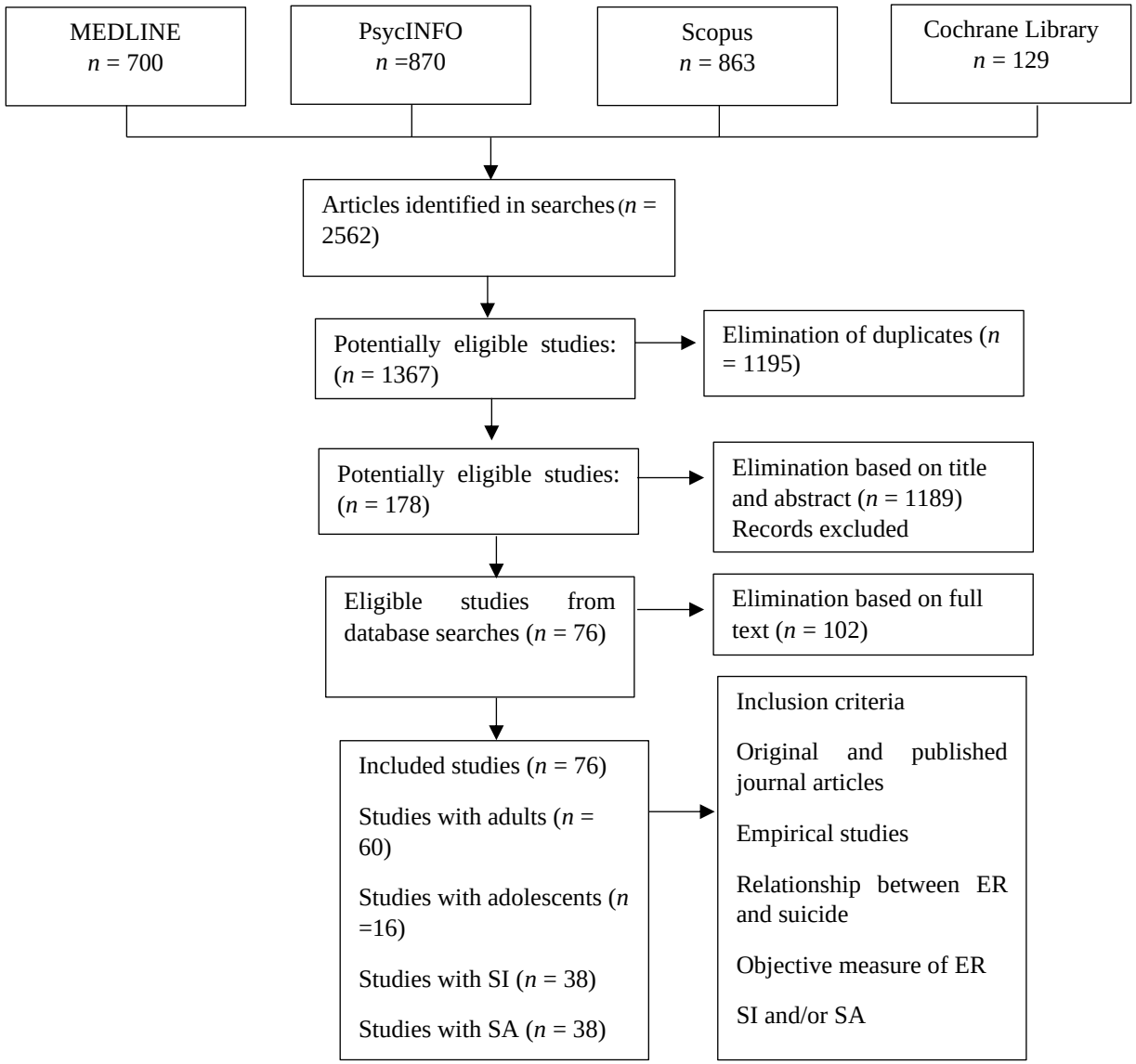

Figure 1. Study selection process flow chart. *Note.* ER = emotion regulation; SA = suicide attempt; SI = suicide ideation.