Journal of Behavioral and Cognitive Therapy 33 (2023) 127—137

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REVIEW ARTICLE

A cognitive behavioral model for dissociation: Conceptualization, empirical evidence and clinical implications

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Received 3 March 2023; received in revised form 24 April 2023; accepted 9 May 2023
Available online 22 May 2023

KEYWORDS
Dissociation;
Emotion regulation;
Mindfulness;
Beliefs;
Attention;
Conditioning;
CBT, beliefs

Abstract
There is a lack of evidence-based models and treatment for dissociation. This article aims to fill this gap by providing a comprehensive evidence-based model for dissociation using a cognitive behavioral conceptualization. We postulate that, following an initial experience of dissociation, associative conditioning will increase the frequency and intensity of dissociative symptoms. Various mechanisms could facilitate dissociation: negative beliefs about emotion, beliefs about dissociation, emotional dysregulation, low attentional control and poor mindfulness skills. Based on this model, a range of clinical interventions can be proposed to reduce dissociation, including cognitive restructuring through reality testing, decisional balance and Socratic questioning, emotion regulation and attentional training, and mindfulness-based programs. The impact of these interventions on dissociation needs to be appraised using experimental methodologies (randomized controlled trials and intervention studies with outcome measures).

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https://doi.org/10.1016/j.jbct.2023.05.003

Contents

Introduction

Dissociation is defined as a disruption in the usually integrated functions of consciousness, memory, identity, and perception of the environment (American Psychiatric Association, 2013). Dissociative symptoms appear in many disorders, including dissociative disorders, post-traumatic stress disorder (PTSD), anxiety disorders, borderline personality disorder and schizophrenia spectrum disorder (American Psychiatric Association, 2013; Bernstein & Putnam, 1986; McKinnon et al., 2016; Murphy et al., 2017; Swart et al., 2020). To the best of our knowledge, no evidence-based treatment for dissociation currently exists, possibly due to the lack of evidence-based conceptualizations. The best-known theory of dissociation among clinicians and researchers is structural dissociation (Van der Hart et al., 2006). However, this theory, based mainly on clinical descriptions and phenomenological interpretations, is not supported by experimental data, reducing the possibility of developing evidence-based treatments. We believe that evidence-based models are essential for setting up psychotherapeutic programs. For example, a wide range of theoretical models have been developed in cognitive behavioral therapy (CBT) (Beck, 2008; Boelen et al., 2006; Brewin et al., 1996; Clark, 1986; Clark & Wells, 1995; Fairburn et al., 2003) and related evidence-based interventions (Carpenter et al., 2018; Dobson, 1989; Foa et al., 2007; Powers et al., 2010; Scaini et al., 2016). To the best of our knowledge, only one cognitive behavioral model of dissociation has been published (Kennedy et al., 2004), This model is based on Beck's cognitive theory (1996). It proposes that dissociation corresponds to an inhibitory decoupling of mental processes at different stages of the cognitive process. However, Kennedy's model has received little interest in the scientific community, possibly because it attempted to replicate structural dissociation theory using cognitive concepts, adding little novelty. Furthermore, it was not based on fundamental principles such as conditioning models.

Therefore, the aim of this paper is to provide a comprehensive cognitive-behavioral evidence-based conceptualization of dissociation. We considered that this model should be *(i)* based on fundamental scientific principles, *(ii)* based on experimental knowledge in the field of dissociation, and *(iii)* provide indications for new psychotherapeutic interventions, differing from other models of dissociation (e.g. structural dissociation theory). To this end, we will first define the clinical features of dissociation and describe how it develops. Next, we will focus on the model and its core components, before reviewing the empirical evidence

supporting it. Finally, we examine the clinical interventions based on this model and assess the limitations of the model.

Clinical description of dissociation

To conceptualize dissociation accurately, we first need to describe it at the clinical level, in other words, its typical symptoms. The international classifications of diseases (American Psychiatric Association, 2013; World Health Organization, 2019) divide dissociative syndromes into different categories, namely depersonalization-derealization disorder (DDD), dissociative amnesia, dissociative identity disorder (DID), and not-otherwise specified dissociative disorder. These classifications are thus based on a description of dissociative symptoms. However, they do not necessarily cover all clinical manifestations of dissociation, such as identity confusion, absorption, black-outs, being in a fog, altered time perception, altered object perception, altered color perception, tunnel vision, difficulty concentrating, and altered sound perception. These clinical manifestations have been described by researchers and are assessed using standardized measures such as the Dissociative Experiences Scale (DES) (Bernstein & Putnam, 1986), the Clinician Administered Dissociative State Scale (CADSS) (Bremner et al., 1998) and the Dissociation Questionnaire (DIS-Q) (Vanderlinden et al., 1993). Neurobiological models posit that dissociation is also characterized by a decrease in arousal (Kozlowska et al., 2015), corresponding to reduced physiological activity (*e.g.* heart rate). We propose therefore to define dissociation as syndrome that can be composed of one or multiple of symptoms identified throughout the classifications, the standardized measures and the clinical descriptions. A summary of the different symptoms that can be included in dissociation is presented in Table 1. These syndrome could appear in many disorders such as Posttraumatic Stress Disorder (PTSD), panic disorder, borderline personality disorder or dissociative disorders (American Psychiatric Association, 2013). Therefore, we propose here a transdiagnostic model of dissociation, meaning the conceptualization can help to understand dissociation within multiple disorders.

Development of dissociation

A key question is how dissociation develops. While dissociation can be seen on a continuum from non-pathological to pathological (Cardeña, 1994), it seems that its frequency and intensity vary according to the type of experience. Dissociation occurs in the fourth stage of the defense cascade (fright) following an intense emotion (Kozlowska et al., 2015) as part of a homeostatic process of arousal. Anyone can experience dissociation after a strong emotion, although the threshold of activation may differ between individuals. It may be triggered by experiences such as panic attacks, stressful social situations or traumatic events (e.g., rape, violence, war). After an initial experience of dissociation, classical conditioning may occur (for references about conditioning analgesic response see Bolles, 1979; Bolles & Fanselow, 1980; Wiertelak et al., 1992; for reference about general learning see Clark, 2004; Pierce & Cheney, 2008), with 'high emotion' as the unconditioned stimulus, initially associated with lower levels of emotion preceding the high emotional state and altered state of consciousness. Subsequently, lower emotional reactions and an altered state of consciousness would trigger dissociation, increasing in frequency and intensity. This effect of classical conditioning on dissociation has already been proposed in other theories of dissociation: ''Structural dissociation of the ANP (apparently normal parts) does not exclusively occur during trauma per se. It may also result when certain inescapable aspects of daily life become associated with past trauma and become conditioned stimuli" (Van der Hart et al., 2004, p 910). This process is summarized in Fig. 1.

Table 1 Summary of the symptoms of dissociation.

Symptoms	Description
Depersonalization	Feeling I am not myself or am outside my body Not feeling my body anymore
Derealization	Feeling things are unreal
Amnesic Dissociation	Not being able to recall important moments of life
Altered sense of identity	Having the feeling of being composed of multiple parts or personalities
Confusion of identity	Not knowing who I really am
Absorption	Being absorbed by a stimulus or a thought and being unaware of everything else around me
Blackout	Being unaware of the present moment, looking lost and having no consciousness of what is happening
Looking through a fog	Having the feeling that everything around me is foggy
Altered time perception	Having the feeling that things happen either faster than usual or in slow motion
Altered object perception	Objects look different, my own body looks different (bigger or smaller), people look like robots
Altered color perception	Colors seem brighter or duller than usual
Tunnel vision	Having the feeling of seeing through a tunnel and that it's dark at the end
Attentional disruption	Switching off during a conversation, and not taking things in
Altered sound perception	Sounds seem louder or quieter than usual
Decreased arousal	Slower heart rate, slower breathing, lake of energy, catatonia

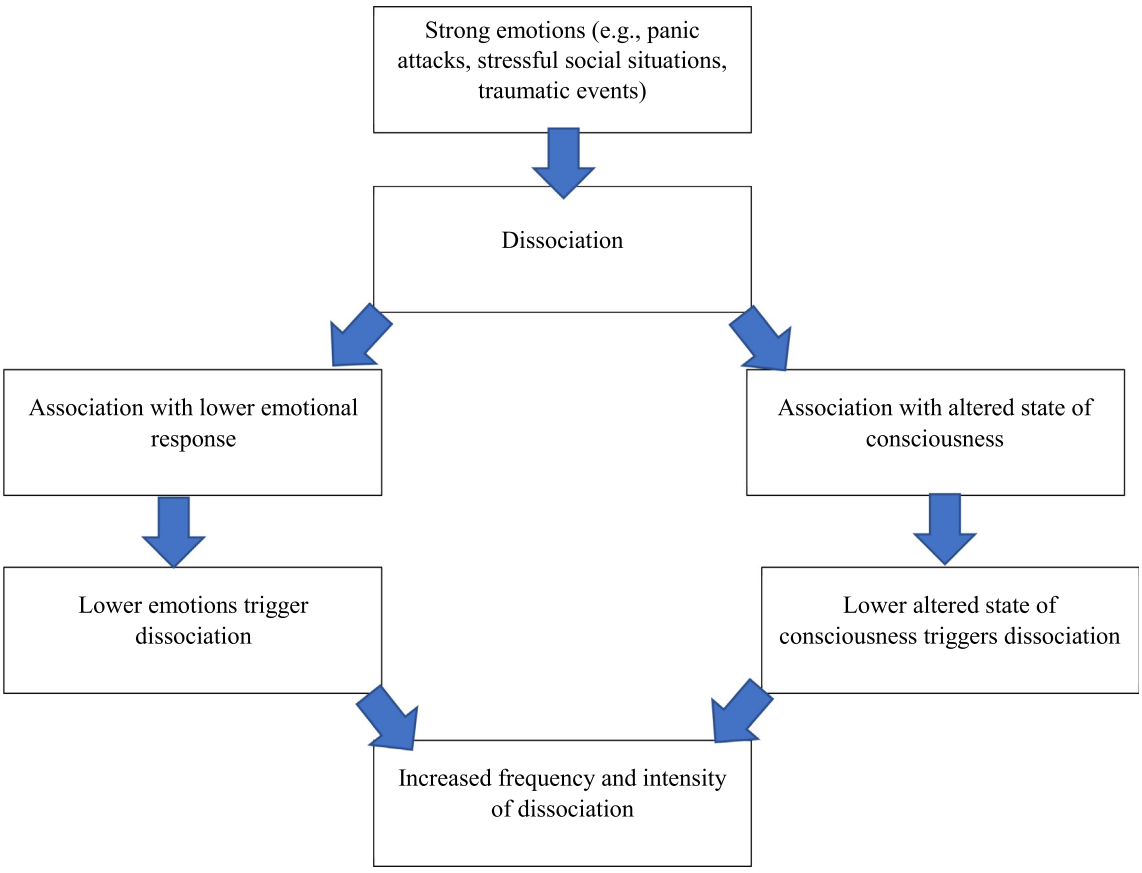

Fig. 1 Development of dissociation based on classical conditioning.

Core components of the model

After the initial development of dissociation, different mechanisms will be involved in its maintenance over the long term. This is a major issue in CBT, as clinicians focus on these mechanisms to reduce symptoms. A summary of the model is presented in Fig. 2. We will first define the concepts briefly, then describe their interactions, and finally illustrate the model with a clinical example.

Definition of the concepts

Beliefs about emotions are what people think about their emotions and emotion regulation (e.g., ''Emotions make me do bad things") (Veilleux et al., 2015). Beliefs about dissociation are what people think about their dissociation (e.g., ''Dissociation helps when I have memories of my past") (Vancappel, Suzan, et al., 2022). Both kind of beliefs refers to Beck's (1979) cognitive conceptualization. It can be defined as core assumptions that would be activated in certain situations and influence emotion and behavior. Difficulties in emotion regulation can be defined as difficulty changing the nature and/or intensity of emotion (Gross, 1998). This is comparable to what Marsha Linehan calls low return to emotional baseline (Crowell et al., 2009). Patient have difficulties to reduce the intensity of their emotional response and/or use maladaptive strategies (e.g., suppression) that maintain the activation of aversive emotions (Barlow et al., 2004; Campbell-Sills et al., 2006). Attentional control refers to the ability to focus attention on different stimuli, and is controlled by the central executive system (Repovs & Baddeley, 2006). This means that attentional control allows people to select where their attention goes and help them to inhibit interfering stimuli. Mindfulness can be defined as awareness through paying attention, on purpose, in the present moment, non-judgmentally (Kabat-Zinn, 1994). Finally, functional impairment refers to decrements to work, social activities, leisure activities, body functions and participation in society due to the symptoms (Weissman, 2009). It refers to how the symptoms alter badly daily life (e.g., being unable to go out with friends or being unable to get a job).

Interaction between the concepts

Initially, a negative appraisal of emotions will increase the emotional response. Next, these beliefs will encourage patients to use maladaptive strategies such as emotion suppression or avoidance, leading on the one hand to emotion regulation difficulties and the maintenance of a high level of distress. On the other hand, as dissociation provides relief, it could activate the idea that it may be a good way to avoid painful emotions. Thus, an increase in emotional activity may trigger the first symptoms of dissociation. Resisting dissociation may then become even harder for patients with low mindfulness and attentional abilities;

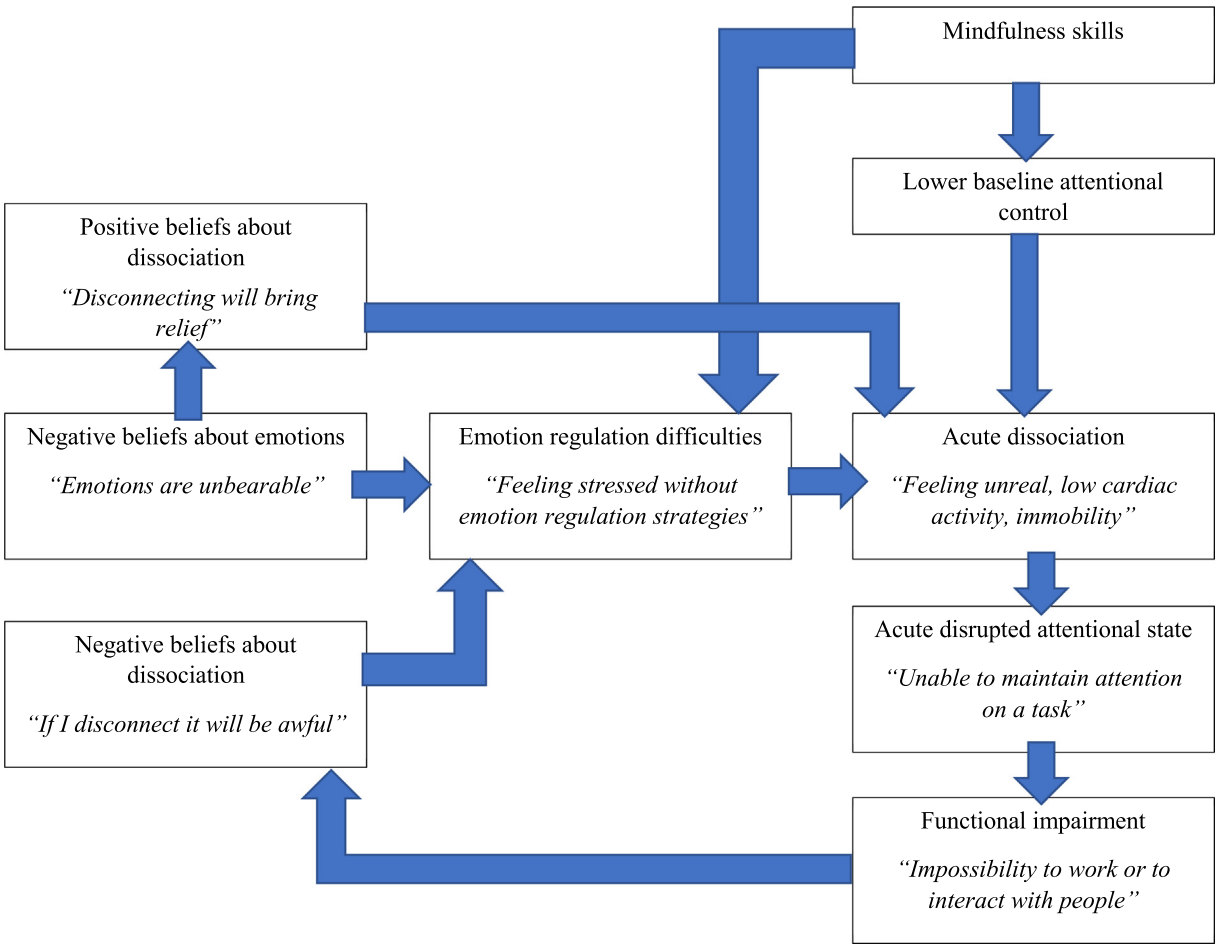

Fig. 2 Cognitive behavioral model of dissociation.

indeed, poor mindfulness skills will accentuate emotion regulation and attentional difficulties. It is at that point that the acute state of dissociation occurs, leading to disrupted attention and functional impairment. These difficulties will lead patients to see dissociation as harmful or catastrophic, further increasing their emotion regulation difficulties.

Clinical vignette

Diachronic analysis of dissociation: Imagine a patient, Kate, who has been victim from a rape when she was sixteen. During, the event she experienced a strong feeling of dissociation for the first time. She felt unreal and disconnected from her body. Since the event, dissociation appears more often after emotional situations (e.g., argument with her boyfriend) or after normal state of altered consciousness (e.g., when she is dreaming in the bus).

Synchronic analysis of dissociation: Few years later, Kate is having an argument with her boyfriend. She might feel sad, anxious and/or angry. She might think that these emotions are unbearable (beliefs about emotion). Consequently, she might either try to suppress them, without success (emotion regulation difficulty), or she might think that dissociation would provide relief (positive beliefs about dissociation). The heightened emotional activity may create the first symptoms of dissociation. Kate may decide not to resist dissociation, or may even deliberately allow herself to enter an altered state of consciousness. At some point, she may try to stop dissociation, but without being able to focus on the present moment (low attentional control). Subsequently, the acute state of dissociation will appear, seriously disrupting her attention and daily functioning. For example, we can imagine that our patient would like to work on a presentation for work, but she is unable to do it. Or she may miss an important medical appointment because of the catatonia and blackout caused by dissociation (functional impairment). She will eventually come out of the dissociative state and realize that she had not prepared her presentation and had missed her appointment. This would make her feel unhappy. Consequently, she will think that dissociation would be catastrophic in certain situations (negative beliefs about dissociation). She will thus anticipate what might trigger this state, creating further anxiety and emotion regulation difficulties, which would ultimately increase the likelihood of dissociation.

Empirical evidence

There is some evidence supporting this model.

Beliefs about emotion

A large number of studies have examined the relationship between beliefs about emotions and emotion regulation difficulties. First, cross-sectional studies found a positive association between negative beliefs about emotions and emotion regulation difficulties in the general population (Mancini et al., 2016) and among patients suffering from PTSD (Mazloom et al., 2016). An experimental study revealed a causal role of beliefs about emotions; participants were asked to activate either negative or positive beliefs about emotions before watching an emotional movie. The results showed that the participants who activated negative emotional beliefs presented a greater persistence of emotional distress and perceived emotion as being more uncontrollable (Predatu et al., 2020). Only one study has examined the relationship between beliefs about emotions and dissociation (Vancappel, Kerbage, et al., 2023). In that study, beliefs about emotion, beliefs about dissociation, emotion regulation and dissociation were assessed in two samples, one from the general population and the other composed of patients suffering from PTSD. It showed that negative beliefs about emotions were associated with higher levels of dissociation and emotion regulation difficulty. It also found a mediating role of both emotion regulation difficulty and positive beliefs about dissociation in the relationship between dissociation and beliefs about emotions.

Beliefs about dissociation

Other studies have examined beliefs about dissociation. A qualitative study found evidence of these beliefs among patients suffering from the dissociative subtype of PTSD (Vancappel, Suzan, et al., 2022). The authors used semi-structured interviews to explore the patients' beliefs about dissociation, which they found could be either negative (e.g. ''People may think I am crazy because of dissociation") or positive (e.g. ''Dissociation provides relief"). More recently, a cross-sectional study found a positive association between beliefs about dissociation (positive and negative) and dissociation, both in the general population and in patients suffering from PTSD (Vancappel, Kerbage, et al., 2023). These concepts are similar to the cognitive behavioral conceptualization of DDD (Hunter et al., 2003), postulating that catastrophic anticipation of dissociation would be the main mechanism of dissociation in this disorder. In an experimental study, Hunter et al. (2014) found that patients suffering from DDD showed less normalizing attributions of internal symptoms and more catastrophic appraisals of depersonalization than healthy participants. They also demonstrated that DDD symptoms tend to decrease during a cognitively demanding task, arguing in favor of the role of a cognitive process in dissociation.

Difficulties in emotion regulation

The positive association between emotion regulation difficulties and dissociation is now clearly established, supported by the findings of a large number of experimental studies (e.g., Merckelbach et al., 2017; Powers et al., 2015). A recent systematic review involving 11,596 individuals confirmed a moderate relationship between emotion regulation and dissociation (Cavicchioli et al., 2021), suggesting that the higher the level of emotion regulation difficulty, the greater the manifestation of dissociative symptoms.

Mindfulness skills

Some studies have focused on the relationship between mindfulness and dissociation. A negative association between the two concepts was found in the general population (Baer et al., 2004; Perona-Garcelán et al., 2014; Vancappel et al., 2021; Walach et al., 2006), in patients suffering from auditory and verbal hallucinations (Escudero-Pérez et al., 2016), in patients suffering from PTSD (Kratzer et al., 2018; Vancappel, Reveillere, & El-Hage, submitted), and in patients suffering chronic pain (Michal et al., 2007). In accordance with our model, Vancappel et al. (2021, accepted) also found a mediating role of both emotional acceptance and attention-concentration in the relationship between mindfulness and dissociation.

Attentional control and acute disrupted attention

Findings about this aspect are inconsistent. Studies that used self-report questionnaires found a positive association between cognitive difficulties and dissociation (Bruce et al., 2007; Matsumoto & Imamura, 2007; Ozdemir et al., 2015; Perona-Garcelán et al., 2011, 2020). However, studies that used cognitive tasks yielded conflicting results; some found a positive effect of dissociation on cognitive abilities (de Ruiter et al., 2003, 2004; Walker et al., 1996), others found a negative effect (Freyd et al., 1998; Guralnik et al., 2000; Haaland & Landrø, 2009; Olsen & Beck, 2012), or yielded mixed results (Dorahy et al., 2005; Kindt & van den Hout, 2003), while some found no significant association (Latalova et al., 2010; Rossini et al., 1996). However, a recent systematic review found that the results of studies with clinical samples are more consistent and tend to support the association between cognitive impairments and dissociation (Vancappel, Tapia, Clarys, et al., submitted). However, it has been pointed out that these studies focused on trait-dissociation, while dissociation is a transient phenomenon (McKinnon et al., 2016). More recently, a study with patients suffering from PTSD found that attentional control was predictive of a dissociative state after an emotional stimulation, rather than a predictor of trait-dissociation (Vancappel, Raysseguier, et al., 2023).

Functional impairment

Cross-sectional studies have found a positive association between dissociative symptoms and functional impairment in patients suffering from PTSD (Boyd et al., 2018, 2020). Another study with patients suffering from multiple psychiatric disorders found a negative impact of dissociative disorder on functional impairment after controlling for the effect of Axis I disorders (Mueller-Pfeiffer et al., 2012). This again suggests that dissociation affects daily functioning.

Implications for clinical interventions

This model has a number of implications for clinical interventions. We can label these interventions as Dissociation-Focused CBT (DF-CBT).

Restructuring beliefs about emotion

Psychotherapy should target beliefs about emotion. The aim here is to help the patient reevaluate their thoughts about emotions. To that end, Socratic questioning and reality testing should be used. Patients should be asked to focus on their emotions and to observe what happens. This could help them see that their emotions do not take control and will naturally lessen. Patients should be asked to activate alternative thoughts when faced with an emotion, such as *''It is painful but it will not last forever*", or *''I can bear it*". This would reduce the emotional response and limit the use of maladaptive strategies such as activating dissociation.

Restructuring beliefs about dissociation

Beliefs about dissociation should also be challenged through Socratic questioning and decisional balance. Giving patients information about dissociation could also help them see that dissociation is neither good nor bad, but a natural mechanism to cope with or even survive a traumatic event, but which is no longer useful. Patients should be encouraged to think *''It is better if dissociation stops but it is not dramatic if it occurs*".

Emotion regulation training

This is a well-known intervention. To help patients regulate their emotions they should be asked first to observe their emotions, using Becks' thought record for instance. They should then be encouraged to adopt behavioral and cognitive strategies (e.g., having a shower, relaxation, cognitive reappraisal). They should also be shown that some strategies are detrimental in the long-term, even if they provide short-term relief.

Mindfulness-based interventions

Mindfulness-based programs could also be developed. It has been proposed that these programs are useful for patients suffering from dissociation (Cloitre et al., 2012; Forner, 2018; Frewen et al., 2015; Zerubavel & Messman-Moore, 2015) and can help them accept their emotions and develop their attentional abilities.

Attentional control training

Patients should be helped to control their attention. This can be achieved by suggesting strategies used in cognitive remediation interventions, such as exercises to stimulate attention and to develop appropriate strategies. This type of intervention could help patients stop dissociation and would also improve their daily functioning. Similarly, attentional stimulation strategies could be suggested to prevent the acute state of dissociation. These strategies could include verbal fluency techniques (asking the patient to give as much animals as he/she can), mental calculation or identifying the color of objects around them.

Organization of psychotherapeutic intervention

As a transdiagnostic model, we propose that these clinical interventions could be used for every patient suffering from dissociation, no matter which diagnostic(s) the patients received. The patients might present one or multiple mechanisms presented in the model. The clinician should identify which process of the model is present and select psychotherapeutic interventions based on this identification. Following the evidenced based practice (Billieux et al., 2012), clinicians should not limit the intervention to what is proposed in this model. They should also integrate concepts from other conceptualizations depending on their patients, to develop an individualized treatment. However, as general recommendations, we propose that the presented psychotherapeutic interventions may be enough for patients suffering only from dissociative disorders. Patients suffering from dissociative disorders with anxiety disorder and/or PTSD may first undertake the DF-CBT and then undertake exposure therapy (for an illustration see Vancappel, Reveillere, et al., 2022).

Limitations

This model presents some limitations. First as a transdiagnostic model, the proposal is not specific for one disorder and integrates experiments from different populations (e.g., general population, dissociative disorders, PTSD samples). A specific model might be more accurate to certain difficulties. Then, the model presents some weakness on the empirical demonstration. First, there is no direct evidence about the possibility to perform classical conditioning on dissociative responses. The past studies only assessed the conditioning of analgesic response within animals, that can be compared to dissociative response. Then, there is an imbalance between the level of proof about the role of the different components of the model. Some concepts have been deeply studied and present a high level of proof about their role in psychopathology (e.g., the impact of beliefs about emotion). Others are more recent and present a lower level of proof (e.g., the role of beliefs about dissociation). For these concepts, the studies have been mainly conducted by some researchers in France, limiting the extend of the conclusion. Finally, the efficacy of the therapeutic interventions has not been demonstrated for the moment.

Therefore, multiple research may be conducted to strengthen the empirical support of this model. First, the different concepts may be assessed in a sample suffering from multiple psychiatric disorders to assess its transdiagnostic aspects and evaluate the adequacy of the model thought structural equation models. Such study should be performed in different countries to assess the possibility

to transfer the model in different cultures. Then, the efficacy of the proposed interventions may be assessed through explorative and control-randomized studies.

Conclusion

The aim of this paper is to provide an evidence-based cognitive-behavioral model of dissociation. This model focuses on a range of mechanisms involved in dissociation: beliefs about emotions, beliefs about dissociation, emotion regulation difficulties, poor mindfulness skills and attentional control difficulties. It offers a wide range of possibilities for clinical interventions. Further empirical studies are needed to assess the predictions of this model. Randomized controlled trials should also be developed to assess the efficacy of the proposed interventions on dissociative symptoms.

Declarations

Ethical approval and consent to participate: Not applicable.

Consent for publication

Not applicable.

Data

Not applicable.

Funding

This work did not receive any specific grant from funding agencies from the public, commercial, or not-for-profit sectors.

Authors' contributions

Both authors worked on the development of the conceptualization. The first author wrote the first version of the manuscript. The second author reviewed and validated the final version.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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