

Stage-specific interventions for emotion dysregulation disorders in adolescents

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Summary

Since most of the early signs of psychological distress are nonspecific and often under the threshold of a diagnosable disorder, especially in early adolescence, a dimensional and transdiagnostic approach is needed to guide early interventions. In this review, we focus on the transdiagnostic mechanism of *emotion dysregulation* hypothesised to underlie a group of psychopathologies that we named “emotion dysregulation disorders”. Some promising interventions useful at different stages of the evolution of such disorders (from subclinical to clinical ones) are briefly presented. Among them, we propose cognitive-behavioural therapies, mindfulness-based interventions, and mentalisation-based treatment. The mindfulness-based interventions are an essential part of our ongoing study on the effects of an 8-week regular practice of mindfulness on non-clinical adolescents between 13 and 15 years old. We finally conclude with a proposition for a potential clinical staging model for emotion dysregulation disorders.

Keywords: *stage-specific interventions, prevention, psychotherapy, emotion dysregulation disorders, emotion regulation, neuropsychiatry, adolescence, youth, mental health*

Why do we need early and stage-specific interventions?

A large proportion of neuropsychiatric disorders emerge between early adolescence and young adulthood. Indeed, 75% of all psychiatric illnesses are already diagnosable before the age of 24 [1], with long-lasting functional consequences [2]. Among the severe psychiatric disorders that emerge during adolescence are affective disorders, personality disorders and psychosis [3, 4]. During the last 30 years, the prevalence of depression, anxiety and functional somatic symptoms in adolescents has increased worldwide [5, 6]. In 2018, 40.7% of adolescents aged between 11 and 15 years old in Switzerland [7] reported at least two psychological or physical symptoms such as sadness, irritability, feeling nervous or anxious, or having sleeping difficulties, happening more than several times per week. Thirty-one countries from an earlier study led by UNICEF

had average rates of one out of four adolescents suffering from mental health problems [8]. Even if this does not represent actual psychiatric disease, we know that subclinical emotion disturbances during this vulnerable period may impact life trajectories [9]. Moreover, it has been demonstrated that brain development during adolescence is particularly sensitive to internal biological and external social stressors [10, 11].

Hence, adolescence has been recognised as a period of high vulnerability in mental health and an opportunity for early interventions [12, 13]. Such practices can have a significant impact on diminishing the current distress related to attenuated clinical symptoms, as well as in preventing the further development of full-blown mental illnesses [14–16].

Clinically, useful interventions might be stage-specific rather than illness-specific. Indeed, the level and nature of the distress (e.g., disability experience or impact on social functioning) rather than a specific diagnosis seem to be the essential therapeutic or preventive targets [17, 18]. The necessity to start an intervention before children or adolescents reach the point of seeking mental help becomes increasingly evident. In the light of such mental and public health needs, we present an outlook on how existing mental health practices respond.

Transdiagnostic approaches, emotion regulation and emotion dysregulation disorders

Since most of the early signs of psychological distress are nonspecific and often under the threshold of a diagnosable disorder, especially in early adolescence, a dimensional and transdiagnostic approach is needed [19, 20]. Similar approaches have been discussed in the current developmental literature as a promising strategy for research, for example, in searching for neural correlates of psychopathology [21] or in defining adaptive treatment targets [22, 23] for populations with diagnostic instability or patients with multiple comorbidities.

In the case of our review, we focus on *emotion dysregulation* as a transdiagnostic mechanism underlying psychopathology. As the opposite of *emotion regulation*, this broad mechanism includes a variety of facets and dimen-

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sions. Gross and colleagues define it as the failure of generating a desired emotion on intra- or interpersonal (or social) levels [22]. This definition can be enlarged by considering the context: any dysregulated emotional experience and expression that interferes with goal-directed behaviour is defined as an emotion regulation failure [24]. In 2013, Gross and colleagues introduced two types of impairments in emotion regulation: (1) not engaging in emotion regulation when it could be helpful and (2) using a poorly adapted strategy to regulate one's emotion [22]. These difficulties in emotion regulation can occur in four different stages according to the authors: (1) identification of the emotions that need regulation, (2) selection of a strategy to attain regulation, (3) the actual implementation of this strategy, and (4) monitoring of whether the undertaken strategy accomplishes the regulation goal and subsequent adaptation. Failures at each of these stages can lead to various psychological and interpersonal difficulties that might undermine a person's flexibility for a volitional goal-directed behaviour and instead enclose them in harmful pathological habits non-adapted to the situation and the context [22, 25, 26]. On top of that, emotion regulation strategies' nature and the process of emotion change pave with additional complexity the road to disorders' aetiology. An interesting attempt to account for them is the multi-level framework of emotion regulation [27]. It classifies emotion regulation into two dimensions: (1) from implicit/non-conscious to explicit/conscious emotion regulation goal and (2) from an automatic to a controlled emotion change process. Some authors also try to find differences in emotion regulation based on sex in order to explain different prevalence of externalizing and internalising symptoms and disorders such as anxiety or depression, but studies show mixed results [28].

Further exploration of these and other facets of emotion regulation such as emotion recognition, or interpretation, or somatic markers, is beyond the scope of this paper. Nevertheless, they are among the principle emotion regulation facets characterising pathologies like borderline personality disorder (BPD) or posttraumatic stress disorder (PTSD) [29–31]. Other transdiagnostic mechanisms such as trauma and attachment [30, 32] also play an essential role in the development and maintenance of adaptive or maladaptive capacities for emotion regulation. It has been argued that they should be taken into account in every diagnostic process, especially when pathologies such as complex PTSD include a mixture of impairments in emotion regulation, self-esteem and social interactions [30]. These interrelated issues are associated with symptoms such as hyper-sensitivity, hyper-arousal and dissociation, challenging therapeutic processes. Difficulties in emotion regulation also play an essential role in the origin of a variety of pathological behaviours and syndromes (e.g., self-harm, anxiety, affective lability) [33]. These are underlined by cognitive and affective difficulties. Irritability, for example, as an affective symptom, is involved both in internalising and externalising disorders. It characterises a large spectrum of psychopathologies among children and adolescents [34] and predicts an elevated risk for negative outcomes and functional impairment in adulthood [35]. Cognitive aspects such as disturbances in attention or impulse control are characteristic for mood, anxiety, and conduct disorders. Already at a pre-diagnostic stage these can be

translated into risk-taking or violent behaviours and might be the main reason for help-seeking, especially by families. Therefore, interventions aiming at decreasing emotion dysregulation should also have an impact on these behaviours [36].

Emotion dysregulation is thus an interesting and rich transdiagnostic mechanism for developmental psychopathology, neuropsychiatry and clinical practice. In the present paper, we label disorders sharing emotion dysregulation and lability under the term of “emotion dysregulation disorders”. Examples of these are mood disorders (depression, bipolar disorder), personality disorders (BPD), attention deficit hyperactivity disorder (ADHD), stress-related disorders (PTSD, complex PTSD), or conduct disorder (CD) and oppositional defiant disorder (ODD). Moreover, the disorders gathered under this umbrella are often comorbid [30, 37, 38], emphasising the need for a transdiagnostic approach to search for more effective treatment targets. Likewise, at the brain level, partly overlapping anomalies have been observed across these different pathologies in the activity and connectivity of prefrontal-limbic networks associated with emotion regulation processes, both in neuroimaging studies in humans and neurobiological models in animals [39–46].

Interventions

Here we will briefly present some promising and probably complementary methods for interventions that target emotion regulation in its intrapersonal or interpersonal forms. Interventions such as cognitive-behavioural therapies (CBTs), mindfulness-based interventions (MBIs) and mentalisation based therapy (MBT) present different specificities that might be well suited for different stages of severity of clinical symptoms. Various forms of CBTs, including dialectical behaviour therapy (DBT) and MBIs have shown positive effects on emotion regulation skills or decrease of symptoms related to emotion dysregulation in randomised controlled trials. Similarly, MBT exhibits good evidence-based results for the treatment of emotion dysregulation disorders; therefore we have included MBT in this short review of promising interventions for prevention and early treatment.

Cognitive-behavioural therapies, self-help and psychoeducation

CBT is a family of psychological treatments first created in the 1960s by A.-T. Beck [47]. The approach is based on the philosophy that psychological problems emerge from unhelpful thinking and behaving, resulting in nonadaptive coping. Thus, the CBT interventions aim at changing patterns of thinking and behaving, and focus primarily on the present symptoms regardless of past experiences [48, 49].

It has been well documented that affection-oriented CBT interventions can efficiently treat emotion dysregulation disorders such as anxiety, depression, BPD or eating disorders in adults, as shown in systematic reviews and meta-analyses [50–52]. The focus on the transdiagnostic mechanism in emotion regulation might be the key to improve patients' conditions [53]. One of the most famous examples is DBT, which was created to treat BPD patients in the 1990s by Marsha Linehan [54]. The treatment incorporates mindful acceptance and legitimization of difficult affective

experiences, as well as a dialectical balance between validation and confrontation, thus proving useful in decreasing anxiety and emotion dysregulation [36, 55]. DBT is effective for the treatment of complex psychopathologies having emotion dysregulation as a hallmark. Trauma-related disorders are a good example, as recognised in the new International Classification of Diseases (11th Revision) “complex PTSD” category [30]. Patients having comorbid BPD and (complex) PTSD benefit well from DBT treatment with prolonged exposure [56]. DBT is also used in other clinical populations, such as substance abusers or alcohol dependence [57, 58]. Among the younger population, it has been tested for adolescents’ BPD or in the context of self-harm [59, 60].

More recently, CBT therapies focused on emotion regulation were tested, such as the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (UP) [61, 62] and the Emotion Regulation Group Therapy (ERGT) [63]. The UP implements “restructuring maladaptive cognitive appraisals, changing maladaptive action tendencies associated with emotions, preventing emotion avoidance, and utilising emotion exposure procedures” [61]. It is specifically useful in the treatment of individuals with multiple comorbid emotion dysregulation disorders [64]. The adapted version for children and adolescents (UP-C) has shown promising results [65]. ERGT is mostly focused on BPD patients and self-harm. A positive effect of this intervention was found for self-harm in young and older women aged from 18 to 60 years old [66]. It has been proposed as an add-on for a clinical setting and can be used with both children and their parents [67]. Another group therapy with focus on emotion regulation and inspired by DBT and trauma-sensitive care is the coping skills programme START NOW [36]. It is effective in reducing the number of disciplinary reports received by inmates in correctional settings [68] and in decreasing subsequent hospital days for participants with anxiety, personality, psychotic or other disorders [69]. A trial is currently underway for female adolescents with conduct disorders [36].

While UP-C and ERGT are often used with clinical populations, more prevention-oriented and purely psychoeducational interventions also exist. They can consist of playing educational games at school to raise awareness on mental health and help children to learn more about emotions in general. These programmes focus on identifying one’s own emotions and those of others and learning to be more empathic [70]. Globally, from the experience of previous CBT-based school interventions, these programmes show improvement in children’s self-esteem, resilience against internalising symptoms and positive outlook for their future [71].

Altogether, interventions based on CBT/psychoeducation with or without parental involvement and that target emotion regulation have shown a positive effect on psychological well-being and symptoms such as anxiety, depression, eating disorders, substance abuse or self-harm in clinical and non-clinical adolescent or young adult population [53, 62, 66, 72, 73].

Mindfulness-based interventions

Mindfulness is originally a Theravada Buddhist meditation practice that has been secularised as a therapeutic inter-

vention initially for chronic pain, then for prevention of depressive relapses [74, 75], stress reduction and promotion of well-being [76]. MBIs are mostly integrated into the third wave of cognitive-behavioural interventions [77]. The core principle is defined as a “moment-to-moment, non-judgmental awareness, cultivated by paying attention in a specific way, that is, in the present moment, and as non-reactively, as non-judgmentally, and as openheartedly as possible” [76]. The beneficial effects of mindfulness have been suggested to act by enhancing executive control, improving emotion regulation and enhancing self-awareness through the modification of self-reference, as there is an increase in body awareness and a decrease in self-identifying processing [78].

Overall, MBIs have become increasingly used in psychosomatic medicine and psychology. In particular, they have been applied to a variety of conditions such as depression, anxiety, chronic pain and substance abuse, as well as, more recently, to attention disorders, traumatic stress or dysregulated eating [79]. Moreover, a recent meta-analysis and a review paper support the efficacy of MBIs not only for the treatment of various ongoing somatic and psychiatric disorders but also for relapse prevention and well-being amelioration [79, 80]. Finally, MBIs have been successfully used for a range of affective pathologies and the development of self-help programmes and mobile applications for prevention and psychoeducational goals [81].

Regarding youth populations, MBI is feasible even with adolescents in different outpatient settings [82]. Globally, meta-analyses and recent studies reported a positive effect of MBI on stress, anxiety, and depression in adolescents’ clinical and non-clinical populations [83–86]. Promising clinical trials recruiting adolescents showed preliminary data suggesting a positive impact of MBI on functional somatic symptoms [87] or anxiety in adolescents at genetic risk for bipolar disorders [88, 89]. However, MBI efficacy for adolescents still needs to be carefully assessed, and precise mechanisms still need to be well understood to enhance these interventions’ positive effect by targeting responsive populations and conditions [90, 91]. This led us to design the “Mindfulteen” Study (fig. 1).

Mentalisation-based therapy

MBT is a psychoanalytically oriented approach that has been developed initially for BPD and its hallmark emotion dysregulation [92, 93]. It shows efficacy for the treatment of a full-blown BPD [94, 95] and early stages of the disorder [33, 96]. More broadly, in adolescents, this therapeutic approach diminishes self-harm [97, 98] and suicide attempts [99].

Regarding emotion regulation as defined so far, this intervention focuses on the interpersonal, thus more complex type of emotion regulation. More specifically, the term “mentalising” refers to the faculty to infer others’ mental states, beliefs and desires that could be fundamentally different from one’s own. The understanding of these (“belief-desire reasoning”) is the tool for understanding and predicting others’ behaviours [100, 101]. The term has been used in the integrative work of Fonagy and colleagues, where they connect it to psychodynamic concepts related to attachment theory [92]. According to the authors, the ability to make inferences on others’ behaviour is acquired

knowledge and can be limited by the developmental context (including parental style linked to attachment disposition [32]) or influences such as emotional activation in interpersonal context [102, 103]. Impairments in mentalising could hinder situationally adaptive perceptions of interactions, therefore rendering the individual unstable or hypersensitive in the complexity of social relations.

Hence, developing the ability of mentalising through psychotherapy has been the main target of MBT. It was successfully implemented in the treatment of BPD, but recently also for other types of emotion-regulation-related disorders such as depression, eating disorders, or other personality disorders (e.g., antisocial personality disorder) [95].

Staging model for early interventions

As we have discussed above, the presented interventions target different facets of emotion regulation, while restructuring maladaptive cognitive appraisals, preventing emotion avoidance, enhancing non-judgmental self-awareness, using an adaptive mentalising, etc. They could be used against common precursor signs and symptoms of emotion dysregulation disorders, such as self-harm, anxiety or affective lability. We propose, therefore, the following model for intervention (table 1) inspired by Chanen and colleagues [33] and Addington and colleagues [104]. It presents stages of severity of emotion dysregulation and the accompanying symptoms. On the different stages, we added the interventions mentioned above that might be adequate given their therapeutic goals and tools.

Conclusions and future perspectives

The above-presented therapies are promising as they are useful for younger populations and include early interventions targeting specific transdiagnostic mechanisms such as emotion regulation. More studies are needed to systematically review and compare the therapeutic tools that might have high impact on each specific stage of emotion regulation impairments. The focus should be on preventive and accessible forms of interventions based on the above-described approaches. As well, understanding brain mechanisms modified by these interventions and their transdiagnostic commonalities will also be valuable to guide their clinical application in the future. Thus, based on clinical practices and research, we should aim at offering well-accepted and useful interventions to prevent chronic psychiatric disorders, keeping our emotions alive but on hold.

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Table 1: A potential clinical staging model for early interventions: emotion dysregulation disorders (adapted from Chanen et al., 2016; Addington et al., 2018).

Clinical stage	Definition	Potential interventions
0	Increased risk of severe disorder (e.g., family history, exposure to abuse or neglect, substance use). No specific current symptoms.	Mental health and emotions literacy (e.g., school interventions and games). Self-help (e.g., MBI apps or books).
1a	Mild or nonspecific symptoms of emotion dysregulation disorder (e.g., disturbances in attention, emotion regulation, and behaviour).	Formal mental health literacy; family psychoeducation (parenting skills, supportive counselling/problem solving, mindfulness, and stress management training).
1b	Subthreshold features of emotion dysregulation disorder (sleep disorders or affective lability/irritability).	Stage 1a interventions plus phase-specific psychosocial intervention (e.g., UP, ERGT).
2	First episode of threshold disorder, self-harm and interpersonal difficulties (e.g., complex PTSD).	Stage 1b interventions plus specific time-limited psychotherapy (e.g., MBT, DBT, START NOW programmes).

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Figure 1: Details on “Mindfulteen” Study

Mindfulteen or the “Early mindfulness-based intervention for anxious adolescents: a fMRI randomised controlled trial”

Despite the positive impact of mindfulness being well documented amongst adult populations, there is still a significant need for studies demonstrating its efficacy on adolescents. In an attempt to bridge this gap, our team designed this study on the effects of 8 weeks of regular practice of mindfulness on non-clinical adolescents between 13 and 15 years old.

Eligibility criteria: The participants need to speak French, have regular access to our web-based interface and be available for our in-person activities. Any history of chronic medical or psychiatric issues (except for current anxiety and past depressive episodes) is an exclusion criterion for the study, as is already practicing meditation or having followed psychotherapy in the last 6 months. The person who wishes to participate should be able to follow group activities and undergo experimental protocols, such as magnetic resonance imaging or blood sample collecting.

Goal and methods: We aim to study the effects of a regular practice of mindfulness on the brain and the emotional well-being of adolescents with different anxiety levels. More specifically, we are interested in stress reactivity, emotion regulation and brain structures that might be influenced by this practice. The young participants are randomized between early and late intervention and will undergo different behavioral tests and questionnaires, physiological measurements, blood sample collection, and MRI scans before and after MBI.

Contact information: With the support of the Leenaards Foundation and the NCCR Synapsy, the three leading clinical researchers are Dr Camille Piguet and Dr Arnaud Merglen for the University of Geneva and HUG, together with Dr Paul Klauser for the University of Lausanne and CHUV. For more details on the project and to contact us, please visit www.mindfulteen.ch or write directly to mindfulteen.study@gmail.com.