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Self Injurious Behavior in Adolescent Girls with Eating Disorders

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1. Introduction

Self-injurious behaviour (SIB), repetitive intentional hurting, bruising, cutting, burning, self-poisoning etc. with the intent to cause pain and tissue damage, is observed as comorbid condition in various psychiatric disorders. SIB is frequently but not exclusively encountered in patients with borderline personality, posttraumatic stress, and eating disorders, but it may also occur in otherwise “healthy” persons, and it may be “learned” from peers, especially in the hospital environment (Ohmann et al., 2008). SIB aims at instantaneously reducing inner tensions resulting from anxiety, depression, stress, self-discontentedness etc., at (re)gaining self-control and escaping from numbness and dissociative states, it may serve to fulfil wishes for self-punishment, and there may (rarely) be appellative aspects alerting other people about ones poor psychical state (Favaro & Santonastaso, 1999). SIB is socially not well accepted and must be differentiated from occasional or psychotic self-mutilation and socially accepted habits like piercing and tattooing. SIB does not necessarily imply death wishes (Simeon et al., 1995) and has clearly to be differentiated from (attempted) suicide or parasuicidal gestures (Eberly, 2005). The relationship between SIB and suicidal behaviour is, however, complex.

Depending on the motivational background, Favaro & Santonastaso (1998, 2000) differentiated two dimensions, impulsive and compulsive, of non-suicidal self-injury (NSSI). Depending on the characteristics of the action, Favazza & Simeon (1995) also distinguished between compulsive (hair pulling, nail biting, skin picking, scratching) and impulsive SIB (skin cutting, hitting and burning). Impulsive SIB occurs episodically, is positively connoted, and patients exhibit only little resistance towards their ego-syntonic impulses. Compulsive SIB is habitual, occurs repetitively, and patients exhibit some resistance towards their ego-dystonic urges. Compulsive SIB shares commonalities with obsessive-compulsive disorder (OCD).

Patients with eating disorders (EDs) often present with a combination of obsessive-compulsive and impulsive symptoms (Lacey & Evans, 1986). Considering the effects, extreme starving, repeated vomiting, purging etc. can also be considered as SIB (van der Kolk et al., 1991; Ahrén-Moonga et al., 2008). In the study of Laye-Gindhu & Schonert-Reichl (2005), adolescents considered their eating-disordered behaviour as self-harm.

SIB in patients with EDs tends to be more repetitive, and characterized by little suicidal intent. Some patients exhibit direct (e.g., skin cutting), some indirect self-aggressive

behaviour (e.g., severe alcohol abuse) (Favaro & Santonastaso, 2002). SIB in ED patients may be considered as an indicator of psychopathological severity (Newton et al., 1993; Claes et al., 2003), especially if it is related to the frequency or severity of SIB (Claes et al., 2003).

Although suicide is not a primary aim, persons engaged in SIB exhibit a greater risk for suicide-related behaviour in clinical populations (Whitlock et al., 2006, Brunner et al., 2007). SIB is a risk factor for suicide: patients with SIB describe more suicidal ideation and past suicide attempts (Dulit et al., 1994). Persons who later committed or attempted suicide often present with a history of SIB (Hawton, 2005; Hawton et al., 1993; Hawton et al., 1999). Adolescents with suicidal ideation have a 18-fold risk of being engaged in repetitive SIB and a 2-fold increased risk of occasional SIB. Among the various subgroups of SIB, most of them do not imply a high suicidal risk and may be classified as “non-suicidal”, but suicide may never be excluded. Therefore adolescents presenting with SIB must always carefully be evaluated for suicidality (Greydanus & Shek, 2009). As concerns SIB and suicide in patients with EDs, BN is more frequently related to suicide attempts (Favaro & Santonastaso, 1996). Patients with EDs who purge and those with comorbid affective, substance use, and cluster B personality disorders (PDs) report more frequently about suicide attempts (Favaro & Santonastaso, 1997; Franko et al., 2004; Milos et al., 2004; Stein et al., 2004).

2. Prevalence

The prevalence rate of SIB is high and rising among adolescents (13-40%, Table 1). It is especially high in patients with borderline personality disorder (BPD) and EDs (25-61%) (Skegg, 2005; Zanarini et al., 2006; Bjarehed & Lundh, 2008; Peebles et al., 2011). Associations between SIB and EDs were identified in the 1980s (Pattison & Kahan, 1983; Lacey & Evans 1986; Favazza et al., 1989): there is a high prevalence of SIB among patients with EDs, ranging between 25.4% and 55.2% (Favaro & Santonastaso, 1998; Favaro et al., 2007; Favazza et al., 1989; Lacey, 1993; Welch & Fairburn, 1996; Claes et al., 2001; Claes & Vandereycken, 2007; Paul et al., 2002). The rates vary depending on research methodology, patient selection, assessment procedure and definition of SIB (Claes & Vandereycken, 2007). EDs are considered as one of the most frequently associated diagnoses in SIB patients, ranging up to 54% to 61% (Svirko & Hawton, 2007). This relates especially to female self-injurers (Dulit et al., 1994; Favazza et al., 1989; Herpertz, 1995). 32% of ED outpatients reported that they had injured themselves at least once (Solano et al., 2005).

Svirko & Hawton (2007) described rates of NSSI between 13.6% and 42.1% in patients with restrictive type Anorexia Nervosa (AN-R), between 27.8% and 68.1% for binge eating/purging type Anorexia Nervosa (AN-BP), and between 26% and 55.2% for Bulimia Nervosa (BN). According to Fahy & Eisler (1993), 25.6% of patients with BN and 24% of patients with AN reported that they deliberately hurt themselves in the last year. Similar data were collected by Favara & Santonastaso (1996): 24% of their outpatients with purging type AN (AN-P) and 30% of patients with purging type BN (BN-P) admitted SIB. This contrasts with a report of Stein et al (2004) who identified SIB in only 11% of outpatients with EDs. Favaro & Santonastaso (1999; 2000) reported no significant differences between AN and BN as concerns types of SIB, except for a higher prevalence of suicide attempts and substance/alcohol abuse in patients with BN. Claes et al. (2004a) observed a high correlation between substance/alcohol abuse and SIB among all types of EDs. Nagata et al. (2003) noted that repetitive SIB tended to prevail among patients with EDs and drug abuse compared to

Publication	Prevalence of combined SIB and ED (%)	Comments
Fahy & Eisler (1993)	25.6 (BN) 24.0 (AN)	BN, n=67, AN, n=29; 1 year prevalence
Favazza & Rosenthal (1993)	61 (ED/SIB)	metaanalysis
Lacey (1993)	8 (regular cutting) 40 (self-damaging & addictive behavior)	BN women, n=112
Herpertz (1995)	25-45	psychiatric inpatients (mostly female), n=154
Favara & Santonastaso (1996)	24 (AN-P) 30 (BN)	Outpatients, n=398 (cited according to Ross et al., 2009)
Favaro & Santonastaso (1998)	72	BN, n=125 (BN-P n=100, BN-NP n=25), age=16-41a
Favaro & Santonastaso (1999)	76 (BN-P) 61 (BN-NP)	BN, n=175 (BN-P n=139, BN-NP n=36), age=16-50a
Favaro & Santonastaso (2000)	59 (AN-R) 68 (AN-BP)	AN, n=236, age 12-49a
Claes et al. (2001)	40-44	ED inpatients, n=134, mean age=19
Anderson et al. (2002)	12-46	BN (BN+SIB n=19, BN+ suicidal behaviour n=28, BN+ no SIB/ no suicidal behaviour n=105)
Paul et al., 2002	34.6 (life time prev.) 21.3 (6 mo prev.) 43.3 (BN) 35.8 (EDNOS)	Inpatients, women (n=376: AN n=119, BN n=137, EDNOS n=120)
Claes & Vandereycken (2003)	38.6 (26-55) 26.1 (AN-R) 27.8 (AN-P) 55.2 (BN)	ED inpatients, n=70, mean age 22a AN-R, n=23 AN-P, n=18 BNn=29
Claes et al. (2004a)	46.5	ED, at least one form of SIB, n=178
Claes et al. (2004b)	47	ED, at least one form of SIB, n=131
Stein et al (2004)	32	ED outpatients, n = 150, history of parasuicide;
Solano et al. (2005)	32	ED outpatients, n=35, lifetime SIB occurrence
Claes & Vandereycken (2006)	45.4	ED inpatients, n=185, mean age=21a, some form of SIB in their recent history
Favaro et al. (2007)	4.8-13.9	community sample, n=934

Claes & Vandereycken (2007a)	38.6 (BN)	ED n=70, mean age 22a
Svirko & Hawton (2007)	25.4-55.2 (SIB in EDs) 54-61 (Eds in SIB)	metaanalysis (1989-2005)
Bjarehed & Lundh (2008)	13-40	ED adolescents, age = 14 cited after Peebles et al., 2011
Favaro et al. (2008)	33	N = 95 (BN-P)
Muehlenkamp et al. (2009)	14.5	N = 131 (BN)
Ross et al. (2009)	13.9	male and female high school students, n=440, age=12-17a; significantly more desire for thinness, body dissatisfaction and perfectionism in SIB vs. no-SIB students
Skarderud & Sommerfeldt (2009)	13-68	higher prevalence in BN and AN-B than AN-R; non-systematic literature search (1985-2008)
Wright et al. (2009)	4.5-4.9	community sample, students, two surveys (1. N=5045; 2. N=805)
Claes et al. (2010)	45	ED female inpatients, n=177
Peebles et al. (2011)	40.8	ED adolescents, n = 1432, age=10-21a

Abbreviations: AN - anorexia nervosa, AN-B - AN bingeing type, AN-R - AN, restrictive type, AN-P - AN, purging type; BN - bulimia nervosa, BN-P - BN, purging type, BN-NP, BN no-purging type; ED - eating disorder, EDNOS - eating disorder not otherwise specified

Table 1. Prevalence of self injurious behaviour in patients with eating disorders

patients with drug abuse only. Concerning AN subgroups, patients with AN-BP showed more impulsive SIB (e.g., cutting and burning) than patients with AN-R. Claes et al. (2001) reported 44% of female inpatient ED patients to admit at least one form of SIB (mostly hair pulling, scratching, cutting, or bruising) with a mean age at onset of 17.5 years (AN-R 34.3%, AN-P 51.8% and BN 43.6%). According to Cabrera (2011) SIB occurred simultaneously with ED in 48.5 per cent of the patients, later in 40 per cent, and before ED in 11.5 per cent only.

2.1 BN and SIB

BN is one of the most frequently associated diagnoses among females with self-mutilating behaviour (Dulit et al., 1994; Favazza et al., 1989; Herpertz, 1995). The co-occurrence of bulimia and SIB is not a simple overlapping of two syndromes: these are two specifically associated entities that share various pathogenic features, but no cause-and-effect relationship. Impulsivity and compulsivity in BN are two distinct coexisting dimensions (Favara & Santonastaso, 1998, 1999). Some symptoms of BN (e.g. purging) can be considered as self-injurious actions. SIB in patients with BN is not only used for relieving tensions but also as an alternative to binge eating and a way to sense one's body again, to restore reality

and identity. Some patients also described their self-injurious behaviour as an irresistible impulse of self-punishment (Favara & Santonastaso, 1998).

Favaro & Santonastaso (1999) reported that patients with BN and impulsive SIB (such as skin cutting and burning) more frequently had a history of sexual abuse and depression, and a higher probability of suicide attempts; whereas patients with BN and compulsive SIB (such as hair pulling and onychophagia) lacked awareness towards emotions and body sensations, showed greater obsessiveness, and had a shorter duration of illness.

The term “multi-impulsive” bulimia created by Lacey & Evans (1986) characterizes patients with BN who, in addition to bingeing, vomiting, or purging, have difficulties to control impulsive behaviours (e.g., deliberate and recurrent SIB, alcohol or drug abuse, kleptomania, promiscuous sexual activity, or shop lifting).

2.2 AN and SIB

Only a few studies have explored the clinical significance of SIB in patients with AN. Common characteristics of the two disorders are female sex, frequent onset during adolescence, patients perceiving themselves as ineffective and dissatisfied with their body, ascetic, and having urges for self punishment (Favaro & Santonastaso, 2000). Both belong to the spectrum of obsessive-compulsive disorders (Hollander & Wong, 1995), and both aim at controlling body functions (Slade 1982; Cross, 1993; Favazza, 1998; Fairburn et al, 1999).

AN-BP patients seem to be more similar to BN than to AN-R (Garfinkel et al., 1980; Garner et al., 1985). Impulsive SIB (skin cutting and burning) and suicide attempts are therefore more frequently observed in AN-BP than in AN-R patients (Da Costa & Halmi, 1992; Favaro & Santonastaso, 1997).

Adolescents with AN who perceive themselves as overweight exhibit a 3-fold increased risk for repetitive SIB. The two core symptoms of AN, distorted body image and low body mass index (BMI), are correlated with repetitive SIB (Brunner et al., 2007). The presence of more than one type of SIB in patients with AN relates to a greater need of controlling the body, and to greater difficulties in accepting treatment (Favaro & Santonastaso, 2000).

3. Functions of SIB in EDs

“Problem behaviours” (e.g., alcohol and substance misuse, ED, and SIB) co-occur, aiming at decreasing negative affect, especially during periods of emotional distress. “Emotional cascades” originate when an individual intensely ruminates on negative affect, thus increasing its magnitude. Engaging in dysregulated behaviours distracts from rumination (Selby et al., 2008). Dysregulated behaviours relate to various personal risk factors, and the ability to intensively perceive negative affect, and may be utilized to experientially avoid negative feelings. According to the principles of the Acceptance and Commitment Therapy (ACT; Hayes et al., 1999), experiential avoidance is defined as the process of avoiding, escaping or otherwise altering unwanted private events (e.g., thoughts, feelings, memories) and the contexts that elicit them. SIB and binge eating are focused distracters. They shift attention away from cues eliciting negative affect, reduce physiological arousal and facilitate the regulation of mood (Linehan 1993; Chapman et al., 2006; Kingston et al., 2010).

A few studies have identified common effects and functionalities of SIB in EDs: SIB serves as a rapid affect regulating strategy for high and low arousal states (Claes et al., 2010), and as a resource of self-help against bodily or emotional discomfort. Although this effect may be short-lived, patients may prefer the physical to the emotional pains (Paul et al., 2002). SIB relieves inner tensions, stops dissociation, and is used for self-stimulation or self-punishment. SIB may help gaining self-affirmation and attention, but it may also result in defective appearance and unattractiveness because of its scars and traces (Vanderlinden & Vandereycken, 1997).

It is still unknown whether affect regulation is the most important function of SIB in patients with various EDs, and if this holds true for all types of SIB. Claes et al. (2010) studied the change of affect before and after various forms of SIB in female inpatients with EDs. 45% of the patients practiced at least one type of NSSI, cutting and scratching being preferred over bruising and burning. The affect regulating function was confirmed for all types of NSSI except bruising. Positively valuated low-arousal affect states increased and negatively valuated high-arousal affect states decreased after NSSI. The increase in positive affect after NSSI was significantly related to the frequency of NSSI and the numbers of functions attributed to NSSI. The affective valence and the level of arousal changed consistently across all types of NSSI. Positively connoted states of low arousal (e.g. "relieved") significantly increased, and negatively connoted states of high arousal (e.g. "anger" or "anxiety") significantly decreased. Scratching, bruising, cutting, and burning were positively (increase positive affect) and negatively (decrease negative affect) reinforced. The change in positive affect after SIB was correlated with the monthly frequency of SIB, the planning of NSSI, and the number of functions attributed to the different SIB methods. Finally the authors found a positive association between the increase in positive affect and the number of reasons given for scratching, bruising, or cutting: the more functions attributed to a particular SIB method, the higher was the increase in positive affect.

4. Relationships between EDs and SIB

The relationships between SIB and EDs are complex, and not categorical but a continuum (Favaro & Santonastaso, 2002). Empirical data suggest that EDs and SIB are, in fact, interrelated (Claes et al., 2001).

Community-based research in adolescents supports a significant relationship between EDs and SIB (Brunner et al., 2007). Ross et al. (2009) found a NSSI prevalence of 13.9% in students. Students engaging in NSSI compared to non-NSSI students completed the Eating Disorders Inventory: NSSI students showed significantly more eating pathology than their non-NSSI peers. They also reported about poor introspective awareness, difficulties regulating impulses and affect, feelings of ineffectiveness, distrust, and social insecurity, bulimic inclinations and dissatisfaction with their bodies. Students who continued or had stopped NSSI reported comparable rates of eating pathology. Regardless of gender, students engaging in NSSI showed more disturbed psychological and behavioural traits that are commonly found in persons with EDs. They also thought more about and engaged more in bingeing. In agreement with current theories, bingeing - like SIB - seems to provide a more indirect but concrete way to fight and relieve feelings of distress. Both behaviours represent body actions that deal with overwhelming affect.

SIB in ED patients has been related to neuroticism and conscientiousness, and negatively to extraversion and openness (Claes et al., 2004a).

Peebles et al. (2011) retrospectively explored the prevalence of SIB in a large clinical sample of adolescents with EDs ($n = 1.432$ patients aged 10-21a). Adolescents with ED and SIB were more likely to be older, female, to have BN or a longer duration of AN, weighed more, had a history of binge eating, purging, disturbed mood or substance abuse. Bingeing and or purging behaviours were more common in patients with SIB, even in those with ED not otherwise specified (EDNOS) or AN.

EDs and SIB may be manifestations of the same underlying difficulties: both use physical attacks on the body, and are interchangeably used to relieve distress (Cross, 1993). Both, SIB and EDs, are body-focused disorders that share a variety of similar etiological, risk and maintaining factors, thus accounting for their co-occurrence (Muehlenkamp et al., 2009, 2011).

According to the emotion avoidance theories (Muehlenkamp et al., 2009), patients with EDs and SIB attempt to actively cope with negative emotional experiences (Skårderud & Sommerfeldt, 2009). A theoretical model explaining the high co-occurrence of SIB in populations with EDs was recently proposed by Muehlenkamp et al. (2011). Early childhood trauma relates to low self-esteem, psychopathology, body dissatisfaction, and dissociation, all being risk factors for SIB and EDs. Additional factors involved in the ED - SIB association are impulsivity, obsessive-compulsive traits, a self-criticizing cognitive style, increased needs of control, and certain characteristics of the family environment (Svirko & Hawton, 2007).

4.1 Affect dysregulation

Failing to regulate negative affect is an important factor for the onset and maintenance of EDs, especially in patients with BN (Agras et al., 2009; Smyth et al., 2007; Waters et al., 2001). Patients with EDs and SIB have a higher incidence of depression compared to patients with EDs without SIB (Anderson et al., 2002; Claes et al., 2003; Favaro & Santonastaso, 1999). Some patients with EDs use SIB to reduce distress and uncomfortable feelings (Favazza & Conterio, 1989; Paul et al., 2002). Since the affective problems precede EDs and SIB, dysregulation of affect could be responsible for the onset of both pathologies, at least in some patients (Ross et al., 2009).

4.2 Dissociation

SIB in EDs are associated with higher dissociation scores (Brown et al., 1999; Claes et al., 2003; Paul et al., 2002). This appears to play a role in the ED - SIB association. Dissociation, the unconscious way of escaping from negative affect, is also related to trauma.

4.3 Trauma

There is a strong association between (early) childhood sexual trauma (before age 15) and the presence of SIB, but the exact mechanism of the link between childhood sexual abuse and ED and/or SIB is still unclear (Claes & Vandereycken, 2007). Early childhood trauma leads to a negative self-image, decreased self-worth and self-esteem, feelings of

incompetence and ineffectiveness. As previously stated, these are all risk factors of SIB and EDs. SIB in EDs was associated with childhood physical and sexual abuse (Dohm et al., 2002), but not with adult sexual abuse (Brown et al., 1999). There is a significantly higher prevalence of childhood sexual abuse in self-injuring patients with EDs compared to non-self-injuring patients with EDs (Tobin & Griffing, 1996).

4.4 Impulsivity

Increased impulsivity (trait and state) is an important and causal factor for the association, onset, and maintenance of EDs and SIB (Brown et al., 1999; Claes et al., 2001, 2003; Svirko & Hawton, 2007). The alternative hypothesis that increased impulsivity emerges as a side-effect of ED pathology and in turn leading to SIB (Fessler, 2002) is not very probable because of the timing: SIB may emerge before, after, or at the same time as the ED (Paul et al., 2002). The association between SIB and EDs appears to be more specific than an association between EDs and other impulsive behaviours (Welch & Fairburn, 1996; Favazza & Conterio, 1989).

Impulsive behaviours are a trans diagnostic characteristic of EDs (Favaro et al., 2005) – they are very common, and the co-existence of even more than one type of impulsive behaviours is not uncommon. Various studies have implicated impulsivity as a maintaining factor of bulimic symptoms (Sullivan et al., 1998; Fahy & Eislser, 1993; Engel et al., 2005). Among EDs, impulsive and multi-impulsive subjects have specific temperamental characteristics (high novelty seeking and low persistence) and show increased purging behaviour.

The assumption that impulsive behaviours are specifically associated with binge eating does not hold true. Impulsive behaviours are involved in all four diagnostic subgroups of EDs (AN-R: restricting AN, AN-BP: binge eating/purging AN, BN-P: purging BN, BN-NP: non purging BN) (Favaro et al., 2005). Binge eating, however, significantly predicts the presence and number of impulsive behaviours.

The presence of various types of impulsive behaviours (e.g. SIB, suicide attempts, substance and alcohol abuse, stealing, running away etc.) is correlated with severe eating pathology, fears of maturing, early traumatic experiences and symptoms of other psychiatric disorders.

4.5 Obsessive-compulsive disorder, ED and SIB

There is a link between obsessive-compulsive disorder (OCD) and EDs and the two disorders share a specific pathophysiologic background (Sallet et al., 2010). There is also a link between OCD, SIB, and EDs: SIB Patients with EDs and SIB had significantly more obsessive-compulsive thoughts and behaviours compared with ED patients without SIB (Paul et al., 2002). Patients with BN and SIB had significantly more comorbid OCD compared with patients with BN without SIB (Anderson et al., 2002). At present it is not clear if the main link between OCD and SIB is the additional distress caused by the OCD or the SIB background or if there is a common pathophysiologic background for all three disorders (if SIB is considered a disorder and not a symptom).

4.6 Impulsive and compulsive SIB

Favaro & Santonastaso (1998, 2000) explored Favazza & Simeon's (1995) subcategorization of impulsive and compulsive SIB. Using factor analysis, the authors confirmed the two

orthogonal symptom dimensions model, finding “impulsive SIB” (skin cutting, burning, suicide attempts, substance/alcohol abuse, and laxative/diuretics abuse), and “compulsive SIB” (hair pulling, severe nail biting, self-induced vomiting). Favaro & Santonastaso (2000), repeated their study in patients with AN and SIB. They again confirmed their two-dimensional model of impulsive vs. compulsive SIB. In AN patients, the compulsive SIB factor included hair pulling and severe nail biting, the impulsive factor included skin cutting and burning and suicide attempts. The authors found that a combination of impulsive and compulsive SIB may be observed occasionally. They also detected a third factor, purging, in this specific group of patients. Substance/alcohol abuse did not load on any factor, probably because of the small number of such patients in the sample. The impulsivity SIB dimension significantly correlated with a temperament factor, novelty-seeking, a trait believed to be related to impulsivity (Cloninger, 1994). Compulsive SIB correlated with the temperament factor, harm avoidance, a trait believed to be related to obsessive-compulsive disorder (Maggini et al., 2000). These results suggest that impulsivity and obsessive-compulsive characteristics are involved in different types of SIB and ED patients.

4.7 Self-criticism and self-punishment

Both disorders, SIB and EDs, may be exploited as a means of self-punishment (e.g., Herpertz, 1995; Lacey, 1993; Paul et al., 2002; Favaro & Santonastaso, 2000). Patients with EDs and SIB are generally more self-critical and feel guiltier than patients with EDs who do not harm themselves (Claes et al., 2003). In addition, patients with EDs and SIB express greater body dissatisfaction than those without SIB (Anderson et al., 2002; Solano et al., 2005). This indicates again that patients with EDs and SIB exhibit a self-critiquing cognitive style (Anderson et al., 2002).

4.8 Control

Both EDs and SIB view their bodies as a means to control overwhelming affect (Ross et al., 2009). The role of this factor is still unclear because there are no studies providing direct evidence for the need for control being involved in the ED-SIB association (Svirko & Hawton, 2007).

4.9 Family environment

Although former interpretations of the “typical ED family” with dysfunctional transactional patterns (eg, Lagos, 1981) did not hold, families of patients with EDs generally are a complicated environment (Fujimori et al., 2011). Patients with EDs and SIB describe their family environment as less cohesive, expressive and more conflictual than those without SIB (Claes et al., 2004b).

Families of patients with EDs showed high emotional over-involvement (60% vs. 3% (controls)) and high criticism (47% vs. 15%) as signs of high levels of expressed emotions (EE) in these families (Kyriacou et al., 2007). Yamaguchi et al (2000) reported that patients with EDs who had overprotective parents (another EE factor) exhibited increased suicidal behaviour. This is an important finding because EE relate to outcome and therapy.

5. Pain sensitivity and ED

Pain sensitivity is decreased in patients with EDs (Claes et al., 2001, 2006). Patients with EDs who report about decreased sensation of pain during SIB have a longer history of SIB and a higher prevalence of dissociation and traumatic experience. The presence/absence of pain reported during SIB is not significantly related to the type of ED but to the duration of the disorder: the longer the history of SIB, the less pain is reported. There are significant correlations between pain sensation and other features of EDs, eg, patients with lower body weight / BMI report about less sensation of pain during cutting.

6. Personality disorders and EDs

The presence of a PD is an important factor in patients with EDs that also contributes to SIB (Eberly, 2005). There is a close co-morbidity of EDs and especially borderline, schizoid and obsessive-compulsive PDs. (Godart et al., 2000). The "Practice guideline for the treatment of patients with EDs", edited by the American Psychiatric Association (2006), recommends to routinely assess all patients with EDs for the presence of a PD. In clinical studies on EDs it may be difficult to find out predisposing factors and their consequences in patients with EDs (Ahrén-Moonga et al., 2008).

Halmi (2003) speculated that EDs could play a role in the development of a PD, EDs serving as a mode of expressing difficulties of personality dysfunction at a younger age. This is not very probable because the "roots" of PDs date back to a much earlier developmental stage (Young et al., 2003) and ED psychopathology is considered to be more "reactive". But the "true" origins of EDs are not understood as yet. In contrast Favaro et al. (2005) stated that impulsive or multi-impulsive behaviour in EDs does not necessarily relate to PD because impulsive behaviours usually diminish or disappear with remission of the ED.

There are greater problems, poorer functioning, and protracted courses in patients with ED/PD in comparison to patients with only ED or only PD. This is also true for other, non-ED axis I disorders. Chen et al. (2011) reported that EDs in female patients were associated with poorer global functioning and non-ED axis I and II disorders, especially borderline and avoidant PD, whereas in male patients EDs were more associated with axis II disorders, especially borderline PD.

6.1 BPD and EDs

Various studies have examined the relationship between BPD and EDs (e.g. Cassin & von Ranson, 2005; Levitt et al., 2004). Chen et al. (2009) observed EDs in about half of treatment-seeking BPD females. BPD patients with BN were four times as likely to engage in frequent SIB (Dulit et al., 1994). Absence of an ED improves the prognosis of BPD (Zanarini et al., 2004).

Although the prevalence of BPD in patients with AN-BP is similar to those with BN (Braun et al., 1994), cluster B PD psychopathology appears to be higher in patients with BN compared to AN patients (Bulik et al., 2004; Franko et al., 2005; Franko & Keel, 2006; Holderness et al., 1994; Rosenvinge et al., 2000). Previous studies based on diagnostic interviews (Cassin & Ranson, 2005) have reported comorbidity rates for EDs and BPD of around 3% for AN-R, 21% for BN and 9% for binge eating disorder (BED). One-quarter of

women with BN also had BPD (Sansone & Levitt, 2005). A low rate of Cluster B PDs was observed in patients who recovered from AN-R (5%) or AN-BP (11%) (Wagner et al., 2006).

There is a strong relationship between BPD and dysregulated eating behaviours such as binge-eating and purging. Although there is still no clear explanation for the mechanisms of this linkage (Selby et al., 2010b), these behaviours occur frequently in individuals with (Cassin & von Ranson, 2005) and without AN and BN (Marino & Zinarini, 2001).

The dysregulation of negative affect is a hallmark of BPD (Selby & Joiner, 2009) and ED (Selby et al., 2008; Selby et al., 2009). Fluctuations of negative affect and difficulties tolerating negative emotions are responsible for dysregulated eating behaviors (Anestis et al., 2007; Anestis et al., 2008; Whiteside et al., 2007). Eating pathology helps to reduce negative affect (Smyth et al., 2007). Fighting negative affect could thus be one of the common underlying pathophysiological mechanisms.

Sensitivity to rejection, the tendency to worry about and to defensively or anxiously expect rejection, and to intensely react to situations where rejection is expected (Downy & Feldman, 1996), plays a role in in both, patients with BPD and with EDs. Dysregulated eating behaviour seems to be related to dysregulation of emotions (Selby et al., 2010b): patients with BPD exhibit high levels of rejection sensitivity leading to problems with emotional dysregulation, and subsequently to dysregulated eating behaviour (Selby et al. 2010).

6.2 Relationship between EDs, SIB and suicidal behaviour

The risk of suicide is higher in EDs than in any other psychiatric disorders (Harris & Barraclough, 1994; Franko & Keel, 2006). Particularly AN is associated with high rates of completed suicide (standardized mortality ratio for suicide in these patients range from 1.0 to 5.3; Franko & Keel, 2006). There are two specific risk factors for suicide in ED patients, suicidal ideation and a history of suicidal attempts (Prinstein et al., 2008; Franko & Keel, 2006).

One possible reason for the high risk of suicide in AN is the fact that ED patients are continuously exposed to pain, feelings of incompetence, humiliation and despair. This may reduce the fear of pain and thus increase the risk of suicide. On the other hand, feelings of incompetence and despair may lead to suicidal ideation. Selby et al., (2010 a) identified two potential roads to suicidal behaviour in AN: repetitive exposure to painful and destructive behaviours (e.g., vomiting, use of laxatives, and NSSI) endangers AN-BP patients, and exposure to pain due to starvation endangers AN-R patients.

Preti et al. (2010) found a clear decrease of suicide rates in BN as compared to AN in the last decades (suicide rate (AN) = 0,124 per 100 person-years; standardized mortality ratio = 31,0; suicide rate (BN) = 0,030 per 100 person-years, standardized mortality ratio = 7,5). Inpatients with AN have a higher mortality risk that is related to chronicity and seriousness of the illness leading to hospitalization. Contrasting with these reports, Bulik et al. (1999) found no difference in the suicide mortality rates among the various types of EDs.

Huas et al. (2011) identified 6 factors predicting a high mortality risk in severely affected adult AN inpatients: older age, longer duration of ED, history of suicide attempt, misuse of diuretics, intensity of ED symptoms and desired low BMI at admission). Patients with EDs without suicide attempts have a lower suicidal risk.

There are various studies comparing the different rates of suicide attempts in patients with AN and those with BN. Differences are related to different recruitment strategies and different subtypes of patients with AN that were included (Forcano et al., 2011). Some studies report significant differences (Bulik et al., 1999; Herzog et al., 2000), some report higher rates in BN (Favaro & Santonastaso, 1997, 2000; Nagata et al., 2000; Chen et al., 2009; Ahrén-Moonga et al., 2008), and some in AN (Franko et al., 2004).

Relatively few studies have explored the suicidal risk in relation to the AN subtype. Higher rates were reported for AN-BP compared to AN-R patients (Favaro & Santonastaso, 1997; Bulik et al., 2008; Milos et al., 2004; Youssef et al., 2004; Forcano et al., 2011). "Migration" from AN-R to AN-BP increased the likelihood of a suicide attempt (Foulon et al., 2007). Especially purging behaviours are associated with higher rates of suicide attempts (Franko & Keel, 2006; Tozzi et al., 2006). Patients with AN-BP were reported to possess a higher pain tolerance compared to patients with AN-R (Papezova et al., 2005). Although AN-BP patients exhibit a higher suicidality risk, AN-R individuals still have elevated rates of attempted suicide when compared to the general population (Franko & Keel, 2006). Suicidal behaviour is more frequently observed in binge eating disorder (BED) when compared to obese non-BED control patients (Grucza et al., 2007).

Suicide attempts occur in 3% to 20% of patients with AN (Franko & Keel, 2006). Patients with AN who attempted suicide were characterized in their personality profile by aggressive and impulsive traits, hopelessness, neuroticism, psychasthenia, and external locus of control (Brezo et al., 2006; Grucza et al., 2005; Ahrén-Moonga et al., 2008), as well as by high persistence, low self-directedness and high self-transcendence (Bulik et al., 1999; Bulik et al., 2008).

Some studies suggest that suicide attempts and NSSI are present in more than half of patients with BN (Franko & Keel, 2006; Svirko & Hawton, 2007). Male patients with BN, and especially those who experience analgesia during self-cutting, exhibit a high risk of committing suicide (Matsumoto et al., 2005; Matsumoto et al., 2008). Internalizing personality traits combined with impulsivity increase the probability of suicidal behaviours in patients with BN. Increased ED symptoms and general psychopathology, impulsive behaviours and parental alcohol abuse were identified as risk factors for suicide attempts in patients with BN (Forcano et al., 2009). These patients also scored higher for harm avoidance, and lower for self-directedness, reward dependence and cooperativeness.

Community based studies in adolescents found relationships between ED psychopathology and suicidal ideation, and between SIB and suicide attempts (Miotto et al., 2003; Brunner et al., 2007; Crow et al., 2008; Neumark-Sztainer et al., 1998; Rodriguez-Cano et al., 2006). An association between ED psychopathology and suicidality has been reported across various clinical and community based samples of adolescent patients. Psychosocial pathology is sex dependent in adolescent patients with EDs: ED psychopathology is related to hopelessness and suicidality in adolescent girls, even after controlling for depression/negative affect, whereas ED psychopathology in adolescent boys is related to self-reported history of sexual abuse and various externalizing problems (drug abuse, violence and impulsivity) (Zaitsoff & Grilo, 2010).

6.3 Impact of PDs on treatment outcome in EDs

Comorbidity of EDs and BPD has significant implications for the course and outcome of treatment. EDs plus BPD results in more frequent hospitalizations, more severe

psychopathology, lower psychosocial functioning and more interpersonal problems (Johnson et al., 1989; Steiger et al., 1994; Wonderlich & Swift, 1990). Comorbid BPD increases the risk of poor response to psychosocial treatment (Coker et al., 1993; Herzog et al., 1991; Johnson et al., 1989; Rossiter et al., 1993; Steiger & Stotland, 1996) and negative outcomes (Johnson et al., 1990; Fichter et al., 1994; Keel & Mitchell, 1997; Steiger & Stotland, 1996; Rosenvinge et al., 2000; Wonderlich & Michell, 1997).

Long-term follow up studies are not consistent and do not unanimously support the findings of short-term studies (Fallon et al., 1991; Norring, 1993; Rowe et al., 2008; Ben-Porath et al., 2009). Grilo et al., (2003) didn't find a poorer treatment outcome of patients with EDs and comorbid borderline, avoidant, or obsessive-compulsive PD, whereas Wilfey et al. (2000) observed a poorer treatment response for patients with BEDs and comorbid Cluster B psychopathology.

7. Clinical correlates predicting SIB in EDs

There are similar predictors of impulsive and compulsive dimensions of SIB in patients with AN and BN (Favaro & Santonastaso, 2002). Childhood sexual abuse, e.g., predicts impulsive SIB in both syndromes (Favaro & Santonastaso, 1998, 1999, 2000, 2008; van der Kolk 1991).

Compulsive SIB is predicted by a shorter duration of illness, and a more accentuated lack of interoceptive awareness in patients with BN; and by younger age, and higher scores on the obsessionality subscale in patients with AN.

Impulsive SIB is predicted by sexual abuse and depression in patients with BN, and by sexual abuse and anxiety in patients with AN (Favaro & Santonastaso, 2000, 2002).

Other significant independent predictors of impulsive SIB were high scores of harm avoidance, and self-transcendence, whereas childhood sexual abuse, the presence of a cluster B personality disorder, and low self-directedness were predictors of suicide attempts (Favaro et al., 2008).

Poor social adaptation and high levels of anxiety are considered predisposing factors in the development of EDs, especially in patients with BN and SIB (Ahrén-Moonga et al., 2008). Wildman et al. (2004) observed that depressive symptoms preceded the onset of both, ED and SIB, in adolescents.

Concomitant impulsive and compulsive SIB is the most important predictor of treatment drop-out in AN patients (Favaro & Santonastaso, 2000), whereas in BN patients, concomitant impulsive and compulsive SIB reduces the risk of treatment drop-out (Favaro & Santonastaso, 1998). This difference was explained by a different role of control: in BN the need for control is ego-dystonic in BN, and ego-syntonic in AN patients (Favaro & Santonastaso, 2000).

8. Differences between EDs/SIB and EDs/no SIB patients

SIB in patients with EDs (EDs/SIB) implies higher levels of psychological dysfunction, consisting dissociative experiences (Paul et al., 2002), and increased impulsiveness compared to EDs/no SIB (Claes et al., 2001, 2003). Patients with EDs/SIB exhibit more clinical symptoms of anxiety, depression, and hostility (Paul et al., 2002), and patients with

more than one type of SIB exhibit the worst clinical symptomatology (Claes et al., 2003). In another study Claes et al. (2003) found significantly more self-criticism, self-abasement, self-punitiveness and guilt in EDs/SIB compared to EDs/no SIB patients. EDs/SIB patients exhibit more cluster B (borderline, antisocial) PDs and a more severe history of trauma than EDs/no SIB. SIB patients report more anger than EDs/no SIB patients. ED patients with a history of SIB are more dissatisfied with their bodies compared with EDs/no SIB patients (Claes et al., 2003; Solano et al., 2005).

Claes & Vandereycken (2007a) reported that high levels of dissociation and self-criticism but not impulsiveness distinguished sexually abused EDs/SIB from EDs/no SIB patients. Stein et al. (2004) reported about more lifetime drug abuse, impulse control problems, bipolar symptoms and more out- and inpatient treatment in EDs/SIB compared to EDs/no SIB patients.

Concerning personality traits in ED patients with and without SIB (cutting, burning, hair pulling), patients with EDs/SIB score significantly higher on the neuroticism and lower on the extraversion scales. On subtraits the EDs/SIB patients appeared to be more anxious, more willing to please and less cheerful, efficient and ambitious. Personality traits (except for impulsiveness) were not associated with the frequency or form of SIB or with subtypes of EDs. There was no significant interaction effect between ED subtype and presence/absence of SIB (Claes et al, 2004a).

From a family perspective, significant differences in the family environment were observed in patients with EDs/SIB vs. EDs/no SIB (Claes et al., 2004b): the family environment of EDs/SIB patients was less cohesive, expressive and socially oriented, and more conflictual and disorganized than the families of EDs/no SIB patients. The authors also observed a poorer treatment prognosis in EDs/SIB patients. Paternal care is also important for ED pathology. EDs/SIB patients exhibited more severe ED pathology (more pronounced body dissatisfaction and increased fears of maturing) and reported about less paternal care. More than half of the patients stated that their fathers demonstrated "affectionless control". EDs/no SIB patients mainly had conflicts with their mother whereas EDs/SIB patients were also involved in conflicts with their fathers (Fujimori et al., 2011).

Patients with BN and SIB are more likely affected of comorbid obsessive-compulsive disorder compared to BNs without SIB (Anderson et al., 2002; Fujimori et al., 2011).

Anderson et al. (2002) examined how women with BN/SIB differed from women with BN/no SIB and from women with BN who attempted suicide with lethal intent. BN/SIB women reported significantly more laxative and drug abuse. Women with BN and suicide attempts had the highest rates of overall comorbidity across the three groups. SIB patients scored significantly higher on the self-transcendence scale. BN/SIB women appeared to engage more in drugs abuse (laxatives and illicit drugs). Patients who attempted suicide had the highest rates of axis I and axis II comorbidities. High scores on self-transcendence may signal a greater sense of dissociation and disconnectedness in BN/SIB female patients.

Adolescents with EDs who engage in SIB are more dissatisfied with the shape and size of their body than their non-SIB peers and manifest greater socially related affective problems. Self-injurers who hurt themselves only once also exhibited more severe eating pathology compared with their non-SIB peers. Adolescents who reported to have stopped self-injuring demonstrated similar rates of eating pathology as adolescents who admitted to regularly

engage in SIB. The authors concluded that cessation of SIB does not immediately change the ED pathology (Ross et al., 2009).

9. Treatment of patients with EDs/SIB

ED/SIB patients are generally difficult to treat (Fujimori et al., 2011). Therapy should address SIB early in the treatment process by finding out predisposing and triggering factors and by teaching alternatives to SIB. Dialectical behaviour therapy (DBT) (Linehan, 1993) is a very efficient treatment program for both disorders, adolescent BPD and EDs (Rathus & Miller, 2002; Fleischhaker et al., 2006; Salbach et al., 2007). DBT was originally developed for chronically suicidal female adult outpatients with BPD. Clinical studies involving adult patients with BPD, BN, and BED show that these patients benefit from DBT (Palmer et al., 2003; Safer et al., 2001; Telch et al., 2001). The program was later modified for adolescents (DBT-A) and includes self-regulatory and cognitive strategies (Miller et al., 1997; Fleischhaker et al., 2006). DBT has significant positive effects on disordered eating, negative mood regulation and depression (Rutherford & Couturier, 2007).

In DBT for eating disorders (DBT-E) changed eating behaviour is considered to be a consequence of stress, traumatisation or difficulties in regulating emotions. The treatment aims at imparting skills to improve regulation of emotions, tolerance to distress, and eating behaviour (Sipos et al., 2011).

Various types of NSSI act as a function of affect regulation in patients with EDs. Therefore treatment of SIB needs to zoom in on this important function (Claes et al., 2010). The authors suggested three helpful strategies:

1. educating the patients on the affect regulating functions of NSSI, enabling patients to understand the functionality of their behaviour;
2. assessing the functionality of affective antecedents and consequences of NSSI, and suggesting alternative, less harmful behaviours for dealing with these irksome affective states; and
3. introducing preventive strategies for dealing with (high-arousal) negative affective states.

Kingston et al. (2010) suggested to reduce experiential avoidance, by suggesting ACT or mindfulness-based interventions, irrespective of the particular pattern of a patients' harmful behaviours.

Claes et al. (2002b) recommended starting with psycho-education about the medical risks of ED behaviour, and to perform a systematic and detailed functional analysis with the patient, identifying external (situational) and internal (emotional and cognitive) triggers that instigate self-harming behaviours. The functional analysis will uncover the functional significance of the behaviour, hierarchical relationships, and the specific situational or behavioural background. This enables the patient to develop meaningful cognitive strategies and to change affective content. In a second step, the patient is encouraged to experiment with alternative and more effective coping strategies in order to decrease tension and to distract attention. Then, the patients are motivated to expose themselves gradually to the situations and emotional triggers that initially triggered SIB (systematic desensitisation), aiming at extinguishing the self-harming reactions by habituating to threatening stimuli. All

major triggering situations have to be mastered following a hierarchical order. Accompanying dissociative reactions have to be identified and fought, employing strategies for reorientation in the here-and-now. Another, essential part of the therapy is cognitive reprocessing of the patient's irrational thoughts, gradually replacing them by more appropriate cognitions. For some patients also a social skills training program is indicated, teaching how to react appropriately in social situations.

The Self-Injury Questionnaire -Treatment Related (SIQ-TR) by Claes & Vandereycken (2007b) focuses not only on detailed self-monitoring of SIB but also on assessing its situational, cognitive and affective antecedents and consequences. The questionnaire helps getting essential information for therapeutic planning, including a wide range of cognitive, affective, and behavioural interventions. It is crucial to detect the functional meaning of the concerned behaviour. If SIB is linked to dissociative states, it may be a way of "keeping in touch" with the here-and-now reality. If associated with low self-esteem, SIB may express self-criticism as self-punishment. However, independent of the background, the first approach to SIB is to try to replace it by a more adaptive and less harmful behaviour while keeping its functionality. Patients are e.g. taught healthier affect-regulation skills to deal with stressful situations, and "grounding" techniques enabling to escape from dissociative states (Briere & Gil, 1998; Zlotnick et al., 1996). Cognitive strategies are used to correct irrational beliefs about traumatic experiences (e.g., from self-criticism to criticising others; the offender is guilty, not the victim).

Kröger et al. (2010) investigated the effect of an adapted 3-month DBT inpatient program in patients with BPD and comorbid AN/BN who had already failed to respond to ED specific inpatient treatments. At follow-up the remission rate was 54% for BN, and 33% for AN. The mean weight of AN patients was not significantly increased at post-treatment, but it was improved at follow-up. The frequency of binge-eating episodes was reduced in BN patients at post treatment and at follow-up. Self-rated eating-related complaints, psychopathology, and global psychosocial functioning were improved.

Selby et al. (2010b) recommended therapeutic interventions in patients with BPDs and EDs: patients should identify and correct rejection related maladaptive thoughts in order to decrease dysregulation of emotions and subsequently dysregulated eating.

Fujimori et al. (2011) highlighted the importance of the fathers participating in the treatment program. The authors stated that insight into the patient-father relationship might provide a sound basis for treating patients with EDs and SIB.

Salbach et al. (2007) designed and evaluated an inpatient DBT-AN/BN program for adolescents. The program lasts for 12 weeks and consists of three phases (preparation, treatment, transfer of reached goals in everyday life). Restrictive dieting (weight gain < 500 g/week), binge eating and purging are considered as SIB and therefore as the problem with the highest treatment priority. Treatment elements are individual therapy (50 min twice weekly), establishing the objectives of the week (30 min weekly), group-therapy for skills training (90 min once weekly), group-therapy for mindfulness training (50 min once weekly), group-therapy for ED and self-esteem (90 min once weekly), family sessions (50 min once weekly or two weekly), group body therapy (50 min weekly or two weekly), reference group (60 min twice weekly). The treatment plan consists of 4 steps -individual freedom is successively increased depending on the patient's body weight and her/his

ability to adequately eat. The body weight is assessed twice weekly. If patients do not regularly gain weight by 500g/week, day pass and visiting hours are suspended.

10. Implications for preventing EDs/SIB

One essential problem in the development of EDs and SIB is bullying by peers or teachers. Effective anti-bullying strategies have been developed (e.g. International Bullying Prevention Association, Kandersteg Declaration Against Bullying in Children and Youth) but these ideas and strategies are not established nationwide as yet.

Another essential problem of patients with EDs and SIB is their difficulty to regulate emotions. Training programs aiming at teaching how to adequately regulate emotions are possibly effective. Such training programs do not exist as yet, their efficacy has to be proven. In addition to focusing on emotion regulation skills, it may be also important to create interventions that increase the skills of individuals in using more abstract and verbal ways to cope with distress (Ross et al., 2009).

There is also a need of trained medical staff, working in the schools, providing early on-site assessment and specific advice for adolescents presenting with eating problems or SIB.

11. Limitations of the EDs/SIB research

Most studies of EDs/SIB have several important limitations.

A first limitation of the research in this area is the use of multiple confounding terms and ambiguous definitions of SIB. Many studies used inaccurate definitions of SIB (Fujimori et al., 2011), making study results difficult to interpret. SIB is often synonymously used with self-mutilation, self-harm etc. Self-mutilation includes severe forms of self-harm. Self-harm is a more general term that is often used to refer to suicide attempts and may also include indirect methods of self-damage, such as binge eating, alcohol or drug abuse. Some authors have assumed that SIB is an independent clinical entity that occurs in the context of ED (Pattison & Kahan, 1983; Favazza & Conterio, 1989), whereas others consider SIB and abnormal eating behaviours as symptoms of BPD (Gunderson et al., 1987). In recent years, the significance of diagnostic subtyping of EDs according to DSM IV criteria has been criticised.

Recent research has shown that patients with EDs are better classified if personality (Westen & Harnden-Fischer, 2001), temperament and character (Klump et al., 2000) variables are taken into account. Therefore, classifying EDs on an impulsivity-compulsivity spectrum has been proposed, especially since a high prevalence of SIB has been detected in these patients (Claes et al., 2002a; Favaro & Santonastaso, 1998).

A second limitation concerns control groups: most studies did not compare ED patients with non-ED subjects. This is especially important for evaluating the prevalence of complications and comorbidities, e.g., the prevalence of EDs/SIB.

A third limitation is been the almost exclusive preference of female patients with EDs. EDs for many reasons have a high preference of females. This difference has, unfortunately, led to disregarding the specific aspects of male EDs.

A fourth limitation was to consider only recent acts of SIB. Therefore, the prevalence of EDs/SIB may be underestimated. Ross et al. (2009) recommended examining lifetime prevalence of SIB.

A fifth limitation relates to research on EDs/SIB restricted to clinical samples. Only a few studies have been conducted involving eating pathologies and SIB in community based, non-clinical, adult populations. These studies, however, have limitations: Favazza et al. (1989) found 38% of their sample of university students with SIB admitted having an ED. Whitlock et al. (2006) noted that SIB respondents were significantly more likely to endorse more than one symptom of an ED as compared to their non-SIB peers. Samples of university students reflect a minority and are not representative of this age group. EDs often occur in upper-middle class populations. Community based studies on EDs have to be explored in a large unbiased group with a wide range of ethnicities and socio-economic status.

A sixth limitation is the lack of standardized measures of eating pathology (Ross et al, 2009).

These limitations and the paucity of sound available longitudinal treatment studies involving large patient samples in adolescents leave many questions open and a multitude of research questions that await to be answered.

12. Conclusion and core messages

The main EDs and SIB share important predisposing, maintaining and prognostic factors. Patients with EDs and SIB are likely to present with a comorbid Axis II disorder, especially BPD. An important task is to detect patients at high mortality risk. SIB should be addressed early in the treatment process.

The core messages are summarised in Table 2:

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| <ol style="list-style-type: none"> 1. SIB is frequently observed in patients with EDs (increasing prevalence, 13-40. Some authors consider dieting, bingeing, self-induced vomiting, and purging as SIB 2. Both body focused problem behaviours have common predisposing, maintaining, and prognostic factors, and aim at reducing or avoiding negative affect 3. Main risk factors for SIB are childhood trauma, dysregulation of affect, dissociative, impulsive, obsessive tendencies, , increased self-criticism leading to self-punishment, complicated family environments 4. SIB in ED patients is associated with increased severity of the ED, psychopathologic comorbidity (especially posttraumatic, cluster B personality disorders), body disgust, impulsivity, and suicidality; more difficult treatment, and a poorer prognosis 5. Psychotherapy should aim at first targeting SIB and suicidal behavior (e.g. Dialectic Behavioral Therapy) 6. Possible preventive strategies include teaching of emotion regulation, and stress management |
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Table 2. Core Messages: Self injurious behaviours (SIB) in adolescent girls with eating disorders (EDs)

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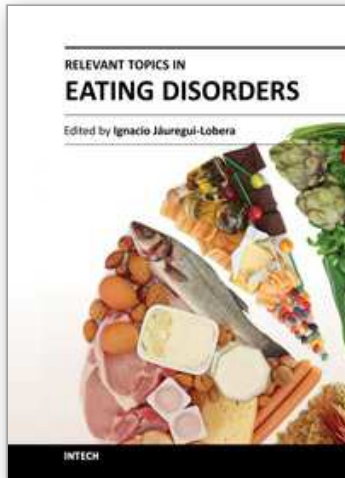
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Eating disorders are common, frequently severe, and often devastating pathologies. Biological, psychological, and social factors are usually involved in these disorders in both the aetiopathogeny and the course of disease. The interaction among these factors might better explain the problem of the development of each particular eating disorder, its specific expression, and the course and outcome. This book includes different studies about the core concepts of eating disorders, from general topics to some different modalities of treatment. Epidemiology, the key variables in the development of eating disorders, the role of some psychosocial factors, as well as the role of some biological influences, some clinical and therapeutic issues from both psychosocial and biological points of view, and the nutritional evaluation and nutritional treatment, are clearly presented by the authors of the corresponding chapters. Professionals such as psychologists, nurses, doctors, and nutritionists, among others, may be interested in this book.

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