

A New Perspective on Extreme Recurring Anorexia and Its Treatment: A Preliminary Study

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Abstract: There is a need for a new perspective on treatment for adolescents and adults with extreme recurring anorexia, underlying prenatal and perinatal trauma, early childhood trauma (or Adverse Childhood Experiences), and complex multi-problems. Current evidence-based therapies are successful with 66% of patients suffering from anorexia with a BMI higher than 17.5. An approach is suggested that regards the eating disorder as a coping strategy for underlying emotional pain. We advocate this approach, which is based on principles like those from CBT, the Self-Determination Theory, and trauma therapy: Past Reality Integration (PRI). The following initial results of a PRI pilot study with 13 clients appear promising.

Keywords: severe/extreme recurring anorexia, prenatal and perinatal trauma, early childhood trauma, Adverse Childhood Experiences (ACES), Past Reality Integration

Anorexia Nervosa is a multifaceted, multidimensional problem. The current DSM-5 criteria (American Psychiatric Association, 2014) are described in Box 1. Severe/extreme recurring anorexia is characterized by an individual being underweight with a very low Quetelet's body mass index (BMI) of approximately $< 17.5 \text{ kg/M}^2$ (Lay et al., 2002).

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Various personal characteristics play a role in the development and maintenance of anorexia, including biological, psychological, and social aspects (Engel, 1977).

Box 1

Anorexia Nervosa: 307.1 (F50.01 or F50.02) according to the DSM-5 (American Psychiatric Association, 2014)

- A. Restriction of energy intake relative to requirements leading to a significantly low body weight in the context of age, sex, developmental trajectory, and physical health. Significantly low weight is defined as a weight that is less than minimally normal or, for children and adolescents, less than that minimally expected.**
- B. Intense fear of gaining weight or becoming fat, or persistent behavior that interferes with weight gain, even though at a significantly low weight.**
- C. Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or persistent lack of recognition of the seriousness of the current low body weight**

Causal mechanisms can be explained in terms of the vulnerability-stress model (Graham et al., 2018; Guerry & Prinstein, 2010). According to Woods-Jaeger et al. (2018), “toxic stress” impairs nervous system development and growth in parts of the brain responsible for planning, problem-solving, and self-regulation of emotions and behaviors. A review by Raevuori, Linna, and Keski-Rahkonen (2014) showed small effects of prenatal and perinatal trauma on eating disorders. However, a recent study of 1,167,043 subjects who experienced premature birth found more robust relations with eating disorders (Larsen et al., 2020).

First of all, there is a broad consensus about biological aspects such as a genetic vulnerability and pre- and perinatal trauma (Attia, 2010; Bulik et al., 2016; Kaye, 2008; Keel & Klump, 2003; Sherag, 1968). Sherag (1968) showed that genes on chromosomes 3 and 4 determine an anorectic predisposition. Anorexia affects the functioning of the hypothalamus. This part of the brain plays a role in saturation and energy management. During anorexia, this energy management becomes too tightly adjusted (Delfos 2011; Swaab, 2004). Pre- and perinatal problems also play an important role, which can form an early trauma and lay the foundation for lagging social-emotional development, anxiety, and negative emotionality (Favaro et al., 2006; Graham et al. 2018; Wolf & Baglivio, 2017; Van der Helm, 2020).

On the psychological side, according to Kaye (2008), young people with anorexia due to pre- and perinatal trauma, Adverse Childhood Experiences (ACES), and anxiety, already have perfectionist and obsessive-compulsive personality traits before revealing anorexia. These characteristics may be reinforced by the performance society, in which

individual performance is linked to dignity (Swierstra & Tonkens, 2008; Young, 1994/1958). Research by the National Institute for Public Health and Environment (RIVM), Trimbos, and Amsterdam Utrecht Medical Center shows that internalizing problems among young people have increased in the past years as a result of pressure to perform at school and in society (Elchardus, 2012; Schoemaker et al., 2019). There is agreement among professionals that anxiety plays a major role in the development and maintenance of anorexia (Delfos, 2011; Godart et al., 2000; Kaye et al., 2004). In addition to the fear of food, fear is often more encompassing. In the study by Godart and colleagues (2000), 83% of respondents with anorexia had at least one form of anxiety disorder in their life.

Social causes and social sustaining factors in anorexia can vary and form the basis for the general fear that will eventually be “projected” on to eating (Van der Helm, 2020; Van der Kolk, 2017). The social factors and physical consequences seem to be more serious in the group of patients who are faced with readmissions (Lay et al., 2002).

People with eating disorders suffer more often than average from pre- and perinatal problems, attachment problems, low self-management, less recognition of emotions in themselves and others, the avoidance of facial expressions of others, a negative self-evaluation, and sensitivity to social dominance (Caglar-Nazali et al., 2014).

Severe/Extreme Recurring Anorexia: An Eating Disorder Coexisting with Underlying Early Trauma

In this article we will speak about both severe and extreme cases of anorexia (BMI<15). Severe/extreme anorexia often coexists with pre- and perinatal trauma, early childhood trauma or ACES, and complex multi-problems like self-harm and suicide. It also tends to be a recurring phenomenon. Characteristics for severe anorexia are currently defined by Body Mass Index (see Box 2).

Box 2

Current description of Anorexia Nervosa

The minimum level of severity in anorexia is based, for adults, on current body mass index (BMI) (see below) or for children and adolescents, on BMI percentile. The ranges below are derived from World Health Organization categories (American Psychiatric Association, 2014) for thinness in adults; for children and adolescents, corresponding BMI percentiles should be used. The level of severity may be increased to reflect clinical symptoms, the degree of functional disability, and the need for supervision.

Mild: BMI > 17 kg/m²

Moderate: BMI 16-16.99 kg/m²

Severe: BMI 15-15.99 kg/m²

Extreme: BMI < 15 kg/m²

Anorexia has the highest mortality risk of all psychiatric illnesses. The mortality rate ranges from 10% to 20% and the longer someone has suffered from anorexia, the greater the risk of death (Hoek, 2006; Keel et al., 2003). The actual mortality rate is higher, because death from anorexia is not always registered as such, but as suicide or some other physical disorder such as serious intestinal problems and heart failure at an early age as a result of permanent sympathetic activation and stress (Van der Helm, 2020). Only 46% of patients recover from anorexia according to the current criteria; one third of patients improve with partial features of anorexia, and 20% become chronically ill (Arcelus et al., 2011; Steinhausen, 2009). The mental suffering from anorexia does not automatically diminish as weight increases (Delfos, 2011). Programs aimed at prevention of eating disorders for this BMI < 17.5 are not yet very effective (Covorve Fingeret et al., 2006).

When pre- and perinatal trauma, early childhood trauma, or ACEs have occurred in a young person's life, their condition often worsens (Van der Helm, 2020). As children develop into early adolescence, societal pressures to perform at school mount and they also compare themselves with their peers (Juvonen et al., 2000). Furthermore, their developmental social-emotional delays and fears make them vulnerable to harassment and victimization. As a consequence, internalizing problems or negative emotionality (Wolf & Baglivio, 2017) continue to increase.

Smolak & Murnen (2002) found in their meta-analysis a small, but significant relationship between eating disorders and childhood sexual abuse. Van der Kolk (2014, 2017) makes a connection between childhood sexual abuse, Post Traumatic Stress Disorder (PTSD), and eating problems. This can be aggravated by frequent revictimization in adolescence. Dramatic events such as early neglect and abuse that children cannot control, frustrate their natural fight and flight responses. This often leads to PTSD, upsets people's self-image and frustrates the satisfaction of their basic needs such as connectedness, competence, and autonomy according to Self Determination Theory (Ryan & Deci, 2017; Van der Helm, 2020).

Also, trauma makes one vulnerable to repetition and re-enactment of trauma (De Keijser, et al., 2018; Van der Kolk, 2017). This results in further aggravation of internalizing problems and eventually the development of PTSD (Van der Helm, 2020). The self-image of young people with anorexia is often low (Noordenbos & Ten Napel, 2017). They often speak of a negative, inner voice—the inner critic (Noordenbos & Ten Napel, 2017). Children “self-silence,” or remain silent about what happened to them (Van der Helm, 2020), relive their fears and trauma, and are therefore “stranded in their past” (Van der Helm, 2020; Van der Kolk, 2014). To perpetuate their world view, they put themselves in risky

situations and repeat their trauma (Van der Kolk, 2020). Therefore, there appears to be a high risk of revictimization, especially in cases of sexual abuse, self-harm, and suicide (Preti et al., 2011; Van der Helm, 2020). A review by Papadopoulos et al. (2009) among 6009 women treated for anorexia, shows that suicide is twice as likely to be the cause of death as the medical consequences of the disease itself.

People with severe/extreme recurring anorexia are often institutionalized, sometimes under mandated treatment in secure facilities. Repression and coercion in institutions clashes with the client's need for control and increases this need for control, so that automatic negative thoughts about food are strengthened rather than decreased (Hachtel et al., 2019; Treasure et al., 2011; Van der Helm, 2020). This can be seen as a coping mechanism, rather than a lack of motivation or mental instability.

Another Perspective: Severe (Extreme) Recurring Anorexia as a Coping Mechanism for Trauma and ACEs

Anorexia could be seen as a form of coping in young people with pre- and perinatal trauma, early childhood trauma, and/or ACEs to deal with this underlying mental suffering. Young people and adults often speak of an internalized voice that yells at them (Van der Helm, 2020). The inner critic is temporarily silenced by basing personal feelings of confidence on weight loss (Noordenbos & Ten Napel, 2017). Deci and Ryan (2008) refer to this as “internalized controlled regulation.” One's focus on controlling their body gives a goal, a sense of security, and temporarily removes the perceived powerlessness (Vansteenkiste et al., 2005). Severe/extreme anorexia could be seen as a defense mechanism in order not to have to feel the weight of pre- and perinatal trauma, ACEs, and pain from the past; personal needs are neglected in this process (Bosch, 2003; Van der Helm, 2020). Part of dealing with traumatic events from the past can be cutting off feelings of contact with one's own body (alexithymia, derealization, and dissociation), a common mechanism in PTSD. The victim places a partition between head and body and switches off the feeling as a means of survival (Van der Kolk, 2014). Anorexia and PTSD multi-problems show therefore the same mechanism; the body is treated as an object to be checked in the absence of other control options (Vansteenkiste et al., 2005). Long-term recovery is therefore more than (temporary) weight gain.

Current Recovery Criteria and Treatment

When a person has reached a healthy weight, behavior and cognition are often still determined by anorexia (Wesselius, 2018), but the label anorexia is officially dropped (American Psychiatric Association, 2014).

DSM-5 diagnoses only indicate when a patient falls into a certain category, but not what the criteria for recovery are. Recovery in the DSM-5 is therefore formulated negatively, namely as the absence of disease criteria (underweight). Scientific research to map the outcomes of clinical treatments for severe/extreme anorexia often measure a change in disease symptoms, especially the physical ones (De Vos et al., 2017). The mere recovery of the physical symptoms should not be regarded as recovery, because even after the symptoms have disappeared, anorexia and fear of food can still determine life (Delfos, 2011), resulting in frequent relapses, and sometimes yo-yo effects with overeating, possibly combined with vomiting. Usually a period of restrictive food intake follows. And often a variety of other compulsive complaints, such as self-harm, are strengthened. The overall quality of life of people with extreme or severe/extreme anorexia is significantly lower than that of people without anorexia (Winkler et al., 2014). From a positive health point of view, recovery from a disease is therefore not just the absence of disease symptoms, but the ability to adapt and be flexible in three health areas, namely physical, mental, and social. If we develop a new way of looking at severe/extreme anorexia and its treatment, we therefore will have to define new criteria for recovery and base these criteria on this broad vision.

People who have recovered from anorexia speak retroactively about the great mental burden of their illness and how their anorexia symbolized, among other things, the suppression of feelings, pain, and a great need for autonomy (De Vos et al., 2017). Current literature has an emphasis on the somatic side of anorexia (Zipfel et al., 2006; Hearing, 2004; Stanga et al., 2008). Standard residential treatments for adolescents with anorexia are strongly medically-oriented. The treatment guideline prescribes structured meals under supervision and (possibly) cognitive behavioral therapies after weight recovery (Quality Standard Eating Disorders NICE, 2018).

A group of adolescents often does not recover within the current programs of residential treatment. Traumatizing readmissions and transfers are common in adolescents with anorexia. Steinhausen and colleagues (2008) have followed 212 adolescents with anorexia from their first clinical admission. They conclude that 44.8% needed at least one readmission. The question therefore arises whether a mainly medical approach, often focused unilaterally on returning to a normal BMI and diet, is sufficient and what good alternatives could be. It is striking that a group that was considered “recovered” according to clinical standards after discharge often returns to residential settings after a while. The care standard writes about “relapse” after somatic stabilization (Berends et al., 2010; Care standard eating disorders, 2017).

De Vos et al. (2017) have investigated how recovered adults view eating disorder recovery. They found that adults who recover from an eating disorder consider psychological well-being as a central criterion for eating disorder recovery. A recommendation from this qualitative meta-analysis is to include precisely this mental dimension in follow-up research into eating disorders, in particular in evaluation studies of treatments.

So, recovery criteria are ambiguous. Public administration speaks of “wicked problems” (Head & Alford, 2015). This is in line with current thinking about recovery from mental illness in general (Dings, 2020). These problems cannot be solved by routine or protocol because their origins are complex and often situated in early childhood, including the pre- and perinatal time, and continue to accumulate. However, it appears that routine is still a frequently-used steering mechanism in youth care, as De Valk’s dissertation (2019) shows: the more complex the symptoms, the more controlling and coercive the treatment.

Current Treatment: Direct and Indirect Coercion

Clinical treatment for severe and extreme anorexia is unfortunately (for patients and staff involved) still largely based on behavioral control. Perhaps this is because there is a gap in evidence-based treatment options for adults with anorexia and a BMI of less than 17.5 (Brennan, 2020). The current treatment paradigm focuses primarily on physical survival. Behavioral control in treatment can lead to an external locus of control orientation and introjected motivation and is therefore similar to methods aimed at weight gain (Van der Helm, 2020). Supporting autonomy (as advised by the Self Determination Therapy) and restoring “normal life” (connectedness, competence and autonomy) is crucial for long-term recovery (Vansteenkiste & Soenens, 2015). Current treatments that limit autonomy can therefore be re-traumatizing for young people with anorexia and underlying trauma because of rekindling PTSD and fear. In the best interest of the patients, alternative treatments will be identified and examined.

Treatments based on taking over control appear to work temporarily when it comes to weight recovery (Le Grange et al., 2014), but have shown to have an opposite effect in the long run (Vansteenkiste et al., 2005). In people with (underlying) trauma, the loss of control can have a re-traumatizing effect (Rusell, 2001; Treasure et al., 2011; Van der Kolk, 2014).

Force-feeding can reinforce food avoidance and diminishes intrinsic motivation. Not (or barely) addressing common thinking patterns in anorexia, such as old pain, low self-esteem, and perfectionism combined with a decline in control can enhance existing eating disorder behaviors (Treasure et al., 2011).

A meta-analysis by Bornstein (2001) shows that there is a statistically significant connection between interpersonal dependence and eating disorder symptoms. By taking away control, the young person develops an external locus of control. He or she feels powerless, feelings of anxiety and PTSD increase, motivation decreases, and self-image continues to decline (Treasure et al., 2011; Van der Kolk, 2014). Developing an internal locus of control is crucial in order to be able to recover and develop intrinsic motivation (Vansteenkiste et al., 2005). This requires an autonomy-supporting living environment (Ryan & Deci, 2000; Van der Helm, 2020; Vansteenkiste et al., 2005).

Treatments based on coercion appear to be a reaction to the severity of the eating disorder symptoms and a subsequent perceived need to medically intervene to save the patient's life. Also coercion is more commonly applied with patients that suffer from higher co-morbidity, multiple admissions, longer disease duration, self-mutilation, and suicidality (Clausen & Jones, 2014).

In addition, coercion is not limited to apparently medical interventions such as fixating, forced medication, and forced re-feeding, but is used throughout the entire treatment system and can turn into repression as a result of professional helplessness (de Valk, 2019; Neuvel, 2019; Rusell, 2001; Van der Helm, 2020; Wesselius, 2018). This can include restrictions on freedom of movement, maintaining an eating list and compliance with eating rules, rest rules, and rules for visiting the toilet, or humiliation of patients (Neuvel, 2019). Several factors, like loss of control, despair, and a feeling of not been heard appear to play a role in the resistance of anorexic patients to compulsive treatment apart from the fear of weight gain (Rusell, 2001). The consequences can be severe. Five years after forced admission, mortality appears to be higher than in patients without forced admission. This difference in mortality does not level out for twenty years (Ward et al., 2015). Therefore, a different approach is needed.

Towards a Different Approach

With pre- and perinatal trauma, early childhood trauma, ACEs, and PTSD, a family environment aimed at relatedness, competence, and autonomy promotes recovery (Judd et al., 2020; Van der Helm, 2020), while an approach aimed at restriction of freedom and coercion threatens recovery in the long term (Van der Kolk, 2017; Vansteenkiste & Soenens, 2015). Motivation and living environment quality have a direct link (Judd et al., 2020; Ryan & Deci, 2017; Van der Helm, 2020; Vansteenkiste & Soenens, 2015). The more the universal needs of autonomy, competence and relatedness are met, the more people become intrinsically motivated

(Ryan & Deci, 2017). Working on self-management in combination with meaningfulness determines recovery from psychological vulnerabilities (Dings, 2020; Van Os, 2014).

A positive living climate appears to form an essential basis for treatment. Treatment as such appears to be more decisive for the treatment result than the method used. After creating a healthy living environment, it is critical to perform a thorough function and meaning analysis of disordered eating behavior (Van der Helm, 2020). It is important to understand the exact moment of onset of the anorexia, what subconscious trauma the patient is avoiding to feel through the eating disorder, and which learned factors from the past maintain the anorexia. It is therefore important to treat pre- and perinatal trauma, early childhood trauma, ACEs, and PTSD as soon as possible to avoid further stress sensitization (Bremner, 2006). When the system plays a causal or persistent role, it is important to work with the system as well.

Enhanced Cognitive Behavior Therapy (CBT-E) is most effectively used for those with a BMI>17.5 (Eating disorders care standard, 2017). In adolescents with severe/extreme recurring anorexia and underlying trauma, CBT-E alone is not particularly effective (Van der Kolk, 2020). Trauma responses from the past may interfere with the effectiveness of CBT (Van der Kolk, 2017). Therefore, a suitable therapy must integrate early pre- and perinatal trauma, childhood trauma, ACEs, and PTSD from the past, with the present situation in order to overcome being “stranded in the past.” Also, the use of body-oriented methods such as yoga, mindfulness, theater, and focusing have proven effective in trauma integration (Van der Kolk, 2017). The use of an assistance dog, for example, can also be effective in PTSD and there is increasing scientific support for the efficacy of equine therapy for people with anorexia and trauma (Cumella & Simpson, 2007; Earles et al., 2015).

As an example of a promising therapy for adolescents and adults with severe/extreme recurring anorexia that integrates past trauma and the present, combined with the normalization of existence (connectedness, competence, and autonomy), a possible alternative to the current medical model could be a therapy that is called Past Reality Integration (PRI).

Past Reality Integration (PRI)

PRI can be compared to a functional (past) and meaning (present) analysis from behavioral therapy. It is a specific combination of principles like those of trauma therapy and CBT. PRI can also be seen as a combination of principles like those of CBT and psychodynamic treatment (Sliedregt, 2019). The efficacy of both client-centered psychodynamic therapy and CBT is scientifically substantiated (Abbass et al., 2014;

Draijer & Langeland, 2017; Driessen et al., 2015; Hunot et al., 2013; Kivlighan et al., 2015; Leichsenring & Rabung, 2011; Lilliengren et al., 2016; Öst, 2008). PRI integrates such interventions in a specific way. Work is being done on cognitions and behavior in the present, but with a link to its origins—the origins seen in pre- and perinatal trauma, early childhood trauma, ACEs, and the various defense mechanisms that have evolved from those origins (Sliedregt, 2019). Children who experience trauma are in a dependent position and need to develop survival strategies in response to these painful experiences (Sliedregt, 2019). When direct action is impossible, conditioned fear, negative thoughts about the self (Kaufman & Crowell, 2018) and negative emotionality develop.

Defense mechanisms can consist of predominantly more internalizing or more externalizing behavior (Sliedregt, 2019). Large-scale research by Wolf & Baglivio (2017) show that externalizing behavior hides pain and negative emotionality (Anglin, 2002). If underlying trauma is not addressed, further stress sensitization arises (Bremner, 2006). These responses to stress are a functional survival strategy when growing up (Bosch, 2003). In PRI, triggers reflecting early childhood trauma are perceived in daily life and as such disconnected from the traumas of the past. With the help of the therapist (and later by her/himself) the client can recognize the triggering reactions and adequately neutralize them. In this way the client learns to see the present-day situation for what it truly is, when the charge of the childhood trauma has been disconnected from the perception of the present. For example, food intake can again be seen as a non-threatening and possibly even pleasant activity.

It is important in PRI that the therapist makes a clear distinction between primary and secondary pain by the therapist. Primary pain is the initial pain arising from pre- and perinatal trauma, early childhood trauma, and ACEs. Secondary pain is conditioned behavior arising from the defense mechanism. Feeling through secondary pain in the hope of recovery, is actually strengthening the conditioning or defense mechanism and therefore is harmful. Recognizing this and anticipating it requires adequate training of the therapist. The first results of this method are promising as this preliminary study shows.

Methods

Respondents

The convenience sample consisted of 13 female respondents. Almost all respondents were young adults; 12 respondents were between 14 and 30 years old. The majority were adolescents, since eight respondents were between 14 and 23 years old. All had severe or extreme recurring anorexia

at the start of treatment, given their BMI, the score on the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Cooper, 1993), and their long-term treatment history. The respondents' mean BMI at baseline was 15.3 and their average EDE-Q scores were 5.1, with 6 representing very extreme eating disorder symptoms and 1.5 representing no eating disorder symptoms.

The convenience sample was selected “through a network of failed treatment.” All of them first followed various (clinical) treatments that were unsuccessful and/or worsened their situation. After it became clear that these treatments yielded insufficient results for them, they were declared chronically ill and ended up in PRI through various channels. For example, there were webinars, an online podcast, and information posted on social media. Several parents of young people with anorexia also made each other aware of the existence of this method, which brought several seriously-ill respondents into contact with PRI therapists.

Perinatal Histories

Data on pre- and perinatal history could be obtained from 12 out of 13 respondents (R) in this paper. Of the 13 respondents, two are part of a dizygotic twin (R8, R9). Respondent 3 could not deliver pre- and perinatal information due to personal circumstances. These 12 respondents who did provide their pre- and perinatal histories experienced one or more pre- or perinatal stressful condition or trauma before, during, or within one month after pregnancy (see Table One). Most stress-increasing conditions or complications were experienced during pregnancy and childbirth itself (R1, R2, R5, R7, R8, R9, R10, R11, R13), but even after childbirth, an existing stress-increasing condition (R2, R4, R5, R6, R7, R8, R9, R11, R12) was experienced by most of the clients. Before delivery, stress-increasing conditions within the system were explicitly mentioned by four of the 12 respondents (R5, R6, R9, R11).

Procedure

Treatment data were acquired retrospectively from treatment files sampled for quality purposes. All respondents (and their parents, if applicable) gave written informed consent to use the data. Experienced PRI therapists initially asked their clients to complete the EDE-Q for quality purposes. They were free to do this and completed it in the absence of their therapist. The respondents did not follow any other therapy besides PRI and were not force-fed while in PRI therapy. The research meets all criteria as described in the guideline for ethical research of the Leiden University of Applied Sciences (anonymity, informed consent, data

storage, and privacy) (VSNU, 2014). Patients were anonymized (given numbers). The researchers were not part of the PRI-team.

Table 1
Stress-increasing conditions before, during and after pregnancy

Respondent	Stress before pregnancy	Stress during pregnancy and delivery	Stress < 29 days after birth	Other
1	-	Remained smaller than usual during pregnancy. Was born prematurely with a low birth weight.	-	-
2	-	Born with the use vacuum pump. Suffered lack of oxygen during and right after birth.	Stress from doctors and parents right after birth. Could not be touched and picked up to be reassured.	-
3	No pre- and perinatal information could be obtained due to personal circumstances	No PPP information could be obtained due to personal circumstances	No PPP information could be obtained due to personal circumstances	No PPP information could be obtained due to personal circumstances
4	-		Was seen negatively in comparison with her prematurely- born niece.	Cousin died by suicide soon after R4's birth.
5	Mother of R5 experienced a lot of work stress before and during the pregnancy.	Near end of pregnancy, R5's mother got severe flu (34 weeks) and sinus infection (36 weeks).	-	-

6	Three years before birth of R6, her parents lost their first child. This was traumatic for the parents.	-	After birth, R6's mother was taken away because placenta had to be removed.	-
7	-	R7 was born on an exceptionally warm day. Heat wave extended several months after the birth.	Immediately after birth of R7, grandmother of R7's mother died in a traumatic way.	-
8	R8 was conceived with IVF.	R8's twin sister began the birth. R8 was not yet ready to be born.	Had to be hospitalized after childbirth.	R8 is part of a dizygotic twin.
9	R9's mother did not know about pregnancy until 6 weeks gestation and kept taking birth control. She had difficult relationship with her family.	R9 was born 6 weeks premature. Was lying in crown position during delivery. Midwife had to use vacuum pump during birth. R9 suffered concussion and lack of oxygen during and right after birth.	Spent one month in incubator after birth. R9's young mother (21yo) was rejected by her family and moved to Netherlands, experiencing a lot of stress because of lack of support and money.	R9 is part of a monozygotic twin.
10	-	During pregnancy, R10's mother suffered from pelvic instability. To induce labor, R10 had electrodes on her head.	-	R10 was born one week prematurely.

11	R11's mother suffered from MS before pregnancy.	R11's mother had a lot of stress during pregnancy due to MS. R11 remained smaller than average during pregnancy (birth weight: 2200 grams). Delivery was initiated at 38 weeks. Umbilical cord was wrapped around neck.	MS also caused stress for R11's mother during postpartum period.	
12			R12 was unable to urinate during first few days because a certain membrane had not yet been broken. Therefore, R12 did not want to drink either. When R12 was able to urinate again, she still did not want to breastfeed, so she was bottle-fed.	
13	-	R13's mother suffered from migraines in first several weeks. First 20 weeks of pregnancy R13's mother experienced renewed grief from prior losses. At 19 th week, mother experienced panic due to contractions that turned out to be normal.		-

Instrument

The EDE-Q is a self-report questionnaire and has been used to measure eating disorder symptoms for the past decades (Peterson et al., 2007). The EDE-Q is considered to be the gold standard for mapping eating disorder cognitions and behaviors (Brennan, 2020). The reliability of the EDE-Q is considered to be high (Peterson et al., 2007). The EDE-Q identifies the degree of concern about weight, shape and the way in which food is handled. The instrument has four subscales: “restraint,” “eating concern,” “shape concern,” and “weight concern,” which can be computed to a total score.

Results

Preliminary results with this respondent group (for individual results see Table 1) shows a mean (M) total EDE-Q score before treatment of 5.154 (SD = 0.657) and after an average of 10 completed PRI sessions, M = 2.342 (SD = 0.984). Results for the four subscales are listed in Table 2.

We computed effect sizes, using Cohen’s D. The total effect size for the total score was 3.42 (high effect size). The effect size for restraint was 0.44 (medium effect size); for eating concern, 1.52 (high effect size); for shape concern, 0.26 (medium effect size) and for weight concern, 1.96 (high effect size). The BMI scores before/after treatment can even increase more because 85% of the patients are still receiving treatment.

Respondents 8 and 11, with extremely low BMIs (below 12.3 and 13.9) showed the least BMI improvement (to 12.9 and to 14.3), and also showed the least improvement of all respondents on EDE-Q measures. Interestingly, as compared to the other 11 respondents, nine of whom had undergone coercive treatments and admissions, respondents 8 and 11 had undergone the most extreme long-term compulsory admissions. Weighing and gaining weight as a result had become very aversive stimuli to them. However, after several sessions they showed signs of recovery and taking up their ordinary life again, like living at home, being able to bicycle, picking up their studies, and meeting with old friends, etc. The respondents’ mean BMI at baseline was 15.3. The mean BMI after treatment sessions with PRI increased to 17.12 (ES = 0.77, high).

We do see variations in BMI improvement. BMI scores usually show large improvements (R2 went from 15.2 to 21.2; R7 went from 14.7 to 17.2; R9 went from 15.9 to 19.8) and occasionally small improvements (R8’s alarming BMI of 12.3 improved after eight sessions to 12.9, which is still very critical, but nevertheless able to continue the therapy; R11 started therapy with an EDE-Q score of 5.7 and ended with 5.2.).

Table 2
Results per client, divided into the subscales of the EDE-Q¹

R	Total score before	Restraint before/after	Eating concern before/after	Shape concern before/after	Weight concern before/after	Number of sessions	Total score after specific number of sessions	Age starting PRI	BMI before/after
1	4.1	3.0/0.0	3.8/0.0	5.0/0.5	4.4/0.4	9	0.2	19	18.9/20
2	5.1	5.8/1.4	3.6/0.4	6.0/1.9	4.8/1.8	8	1.4	28	15.2/21.2
3	5.6	5.6/3	4.8/2.4	6.0/3	6.0/2.2	12	2.65	43	15.3/15.6
4	3.3	3.8/1.8	2.6/2.8	4.1/5.4	2.8/3.7	6	3.7	19	15/16.7
5	4.8	4.8/2.0	3.6/2.0	5.5/4.3	5.4/2.8	4	2.8	14	15/15
6	4.7	5.2/2.4	4.0/3.0	5.1/2.9	4.4/2.8	6	2.8	15	17/18.4
7	5.8	5.0/2.0	5.0/2.2	6.0/2.8	5.8/2.8	12	2.4	16	14.7/17.2
8	5.7	6.0/4.0	4.8/3.8	6.0/4.8	6.0/2.4	8	3.7	17	12.3/12.9
9	5.5	5.6/3.0	4.6/2.0	5.6/3.8	6.0/3.6	13	3.1	17	15.9/19.8
10	5.9	6.0/1.8	5.6/2.0	6.0/2.8	6.0/1.8	10	2.1	23	14.3/16
11	5.7	6.0/5.0	5.2/4.6	5.8/5.8	5.8/5.4	8	5.2	18	13.9/14.3
12	5.1	6.0/3.4	3.6/2.8	5.0/3.8	5.8/3.2	17	3.3	27	15.3/17.3
13	5.2	5.4/0.8	3.6/0.6	5.9/2.8	6.0/1.0	20	1.3	18	16.5/18.9

¹ The frequency and duration of PRI differed. This preliminary study was carried out during a specific period of time, thus causing different patients to be in different stages of the therapy, as is shown in Table 2.

Table 3
EDE-Q and weight descriptives

	Minimum	Maximum	Mean	SD
Total before	13	3.0 5.90	5.1538	.65653
Total after	13	.20 3.70	2.342	.98401
Restraint before	13	3.00 6.00	5.2562	.92432
Restraint after	13	.00 5.00	2.27691	.36024
Concern before	13	3.00 5.20	4.2154	.74145
Concern after	13	.00 4.60	2.1846	1.491100
Shape before	13	4.30 6.00	5.5385	.53469
Shape after	13	.50 5.80	3.4615	1.52290
Weight before	13	4.20 6.00	5.4154	.69982
Weight after	13	.40 5.40	2.7154	1.46734
No treatment	13	4.00 20.00	10.3846	4.38821
Age	13	14.00 43.00	21.0769	7.85771
Valid N (listwise)	13			

All effect sizes are in the right direction. The biggest effect sizes are found on eating concern and weight concern. Shape concern has the smallest effect size. BMI gains vary across patients and across the number of treatment sessions completed. These are preliminary results of clients still under therapy.

Discussion

The introduction of PRI on patients with severe/extreme recurrent anorexia focuses on etiology of anorexia, sometimes starting with pre- and perinatal problems, which can then open up a vulnerability for early childhood trauma, ACEs, PTSD, and revictimization and the need for control (personality problems) as a result of these past experiences. Indeed, in this sample with 13 subjects, 12 subjects experienced pre- and perinatal trauma, while one subject had no access to information about possible pre- and perinatal trauma. This is crucial information for diagnosing the cause of anorexia and determining its subsequent treatment. Further research is needed to determine the external validity of these preliminary results.

These pre- and perinatal traumas, and later vulnerability for stressful ACEs and revictimization, subsequently interact with treatment paradigms and the amount of coercion and the behavioral-control centered approach in current forms of treatment for anorexia. Within the current paradigm, little attention is paid to pre- and perinatal problems, ACEs, PTSD and contextual factors and their influence on the development and maintenance of anorexia. The usual, medically-oriented forms of treatment within this paradigm seem to have little or no long-term

positive effect on the psychological well-being of a group of patients with a low BMI (<17.5) and other psychiatric problems. This shows the need for a more multidisciplinary approach. There is a gap in the scientific literature regarding effective treatments for this group. It is therefore necessary to critically examine alternative approaches and treatment methods. PRI is such an alternative, acknowledging early childhood trauma and pain. The initial results described in this study look promising, with a decline of eating disorder cognitions and an increase in BMI.

The results present an initial phase with 13 clients and show a promising total effect size (Cohens $D = 3.42$). This is possibly a chance effect because of the small population and the large standard deviation. With a larger N , the effect sizes probably would drop to lower levels, but remain promising, because all effect sizes are in the right direction. The biggest effect sizes are found on eating concern and weight concern, while shape concern has the smallest effect size. Compared to the normal population of women aged 18-22 ($M = 1.59$), this mean total after treatment is slightly higher ($M = 2.5$). But when we look at the high starting point ($M = 5.1$) we can expect that with a larger population and/or a time series design, significant results are likely to be substantiated further by a completed treatment trajectory. BMI effect sizes are also promising.

Limitations

In measuring the effect of PRI, methods from the medical paradigm, the EDE-Q and the BMI, have been used as a recovery measure in this pilot study. The changes that the EDE-Q maps concern changes in symptoms. The underlying problems addressed by a method such as PRI have not been identified. The assumption is that a decrease in symptoms also means a decrease in underlying problems. However, this has not been measured. A possible decrease in anxiety complaints, PTSD complaints, and self-hatred and depression have not been measured but can be observed clearly in the clinical setting and in clients' self-reports. While at a more fundamental level, these complaints are so characteristic of severe or extreme recurring anorexia (De Vos et al., 2017; Noordenbos & Ten Napel, 2017).

The long-term effects of PRI have not yet been mapped; this requires follow-up research. The results were generated on a preliminary sample from two PRI therapists. It is advisable to involve more therapists and clients for follow-up research. In this preliminary study, Self Determination Theory scores were not researched. However as part of the PRI process all respondents had returned to their homes (fostering relatedness), were stimulated to restart education (competence), and most importantly, have lost their fear of eating, of gaining weight, of living, of

needing to apply coercion to themselves, to self-harm, and had stopped their medication and were involved in shared decision-making (enhancing their autonomy) (Ten Brummelaar et al., 2017). Additionally, they were planning their futures again; they wanted to live again.

Conclusion

Research on anorexia has shown a correlation between pre- and perinatal trauma, early childhood trauma, ACEs, revictimization and acquiring anorexia nervosa. Past Reality Integration is a multimodal cognitive behavior therapy that works to address past traumas and reinstates present reality testing. The results of this preliminary study show utilizing PRI is a useful form of treatment for patients dealing with severe/extreme recurring anorexia and often complex multi-problems. Utilization of this modality was shown to both be an effective addition to traditional forms of treatment for eating disorders and facilitate a decrease in eating disorder-related symptoms. Integrating pre- and perinatal problems, past ACEs, and revictimization with the present seems to be a fruitful pathway to recovery as van der Kolk (2014) states for PTSD therapy in general. Clinicians need to be aware of the link between pre- and perinatal issues and anorexia nervosa.

In future research, even preventive measures could be developed in early stages of development, such as screening for and reducing pre- and perinatal trauma and ACEs, personality problems, and perhaps providing anxiety-reducing training or therapy, such as mindfulness. PRI could be further reviewed by using a time series design, using SCL-90 (a broad psychopathology checklist) and interviews.

Patients who are struggling with anorexia have a high mortality rate and current therapies do not seem to be able to reduce this. There is a definite need for alternative therapeutic approaches, such as PRI (Brennan, 2020). Additionally, utilizing PRI to address pre- and perinatal problems, ACEs, and other past and present traumas, seems to be a promising alternative to traditional interventions employed in residential settings for anorexia nervosa, which can trigger traumas from the past. Every day, there are (young) lives at stake. There is evidence that by fulfilling clients' basic psychological needs and integrating their past traumas into the present via PRI, we can give them (and their parents) hope and motivation for a meaningful future.

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