Art therapy & anxiety

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Annemarie Madani-Abbing

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Voor Mama,

door wie ik de helende werking

van de kunsten heb mogen ervaren

Voor Oma A,

omdat zij graag had willen studeren,

maar het in haar tijd niet gebruikelijk was

dat vrouwen naar de universiteit gingen

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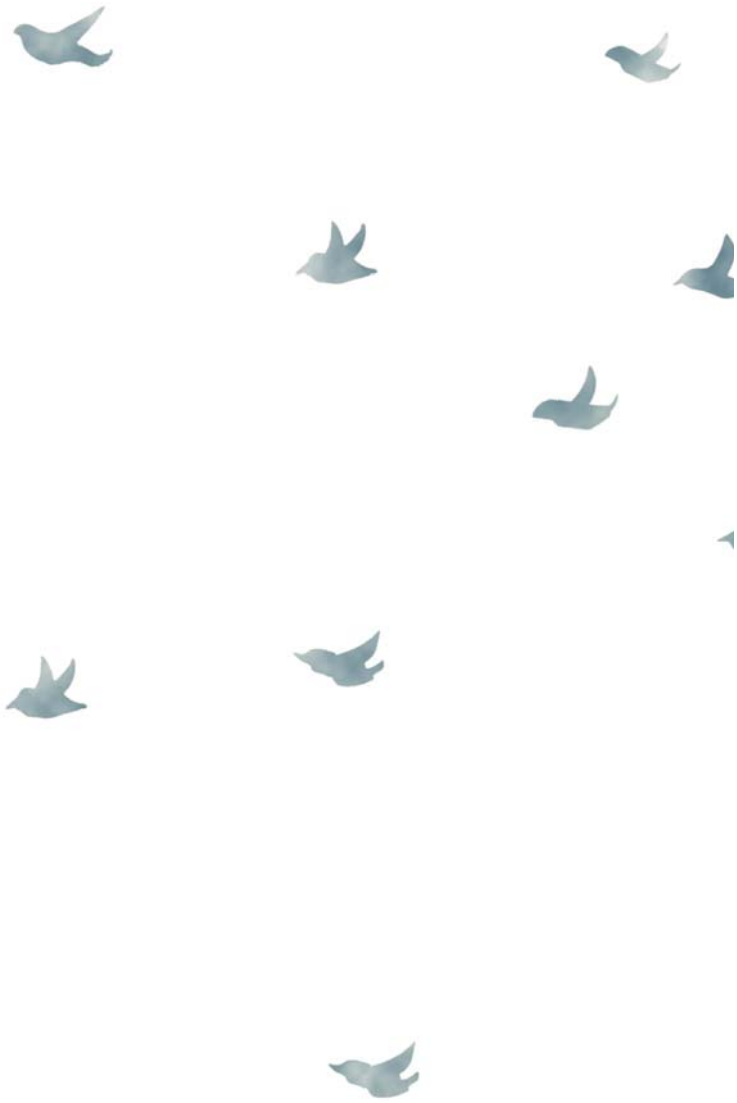
“The most beautiful thing a person can experience is to wonder about the mysterious;
it is the fundamental emotion that creates true art and true science.”
(Albert Einstein)



Chapter 1

General Introduction

Introduction and aim

1

Anxiety is a major problem for individuals within our society, causing suffering and impairment in daily life. One in every five adults in the Netherlands will face serious anxiety problems during life (Nederlands Kenniscentrum Angst en Depressie, 2019).

Frequently used interventions, like Cognitive Behavioural Therapy (CBT) and pharmacotherapy, are not always successful in anxiety treatment. Therefore, many other interventions are offered, with different intensity and different levels of evidence of effectiveness according to the Multidisciplinary Guideline Anxiety Disorders (van Balkom et al., 2013). One of these provided interventions is art therapy, often used as an additional treatment next to CBT and pharmacotherapy.

Art therapy uses visual art exercises to elicit 'experiences' and 'insights', and by using this method it is hypothesized that personal development is stimulated and mental health is improved. Art therapy has several variants, of which anthroposophic art therapy (AAT) is one. Although AAT is used widely in western society, hardly any research has been conducted into the effectiveness of this treatment. Also, the content of the therapy is not well described and working mechanisms are not clear. This is mainly due to the lack of a research tradition within the AAT profession. AAT therapists are not used to provide data for research or to systematically evaluate the effectiveness of their treatment (Abbing & Baars, 2012). The lack of studies on the effectiveness of AAT makes it difficult to evaluate its usefulness and the justification for its application.

To gain insight into the possible value of art therapy in anxiety treatment, thorough research is required and two research objectives are obvious:

1) to assess the effectiveness of art therapy in anxiety in adults, and
2) to explore working mechanisms of AAT

In this introduction, the concept of anxiety and the supposed working mechanisms of art therapy are described. In addition, the status of evidence of the effectiveness of AAT on anxiety is evaluated, to explore the current knowledge gap that needs to be addressed.

Anxiety

Anxiety needs to be differentiated from fear. Fear is a normal and functional response to danger or threat (Rosen & Schulkin, 1998). It can be detected in a physical reaction, the so-called stress response, with typical symptoms such as increased heart rate, heart pounding, shortness of breath, trembling or shaking hands, dizziness, dry mouth, light-headedness, increased muscle tone, sweating and increased attention to the dreaded stimuli, depending on the intensity of the stressor and the response. The stress response enables a person to act quickly upon eminent danger. The sensory perception of a stressor, coupled with an emotional association and cognitive framing, causes the stress response. Normally, an individual can downregulate these responses as soon as the stressor disappears.

Not only external objective danger or threat can evoke a stress response, psychosocial stressors can cause a stress response as well. Individuals in current western society are known to be frequently exposed to social stressors, which can lead to a chronic stress response with large effects on internal regulation functions due to disrupted hormone balance that also influences the brain function (e.g. Davidson & McEwen, 2012). Chronic stress can dysregulate the immune system (Cole, Hawkley, Arevalo, & Sung, 2007), can influence our DNA by epigenetic mechanisms (Epel, Blackburn, Lin, Dhabhar, Adler, Morrow, & Cawthon, 2004) and is thought to result in many physical and psychological problems, such as arteriosclerosis, diabetes, tumours, intestinal problems, fibromyalgia, pain, chronic fatigue, depression and anxiety disorders (Capel, 2017).

The difference between fear and anxiety is that anxiety involves the expectation of future threat (APA, 2013). A fear response has a short duration and is focused on the present situation, whereas anxiety is defined by a longer duration of the emotional state of fear and is typically caused by negative expectations about future events and is usually more generalized, leading to excessive caution, which interferes with adaptive functioning and use of coping skills (Sylvers, Lilienfeld, & LaPrairie, 2011). Clark and Watson (1991) describe that anxiety is characterized by negative affect (NA) and physiological hyperarousal (PH). People with high levels of NA tend to have a negative perception of themselves and their environment, and have negative expectations of the future and of other people (Watson & Clark, 1984; Jeronimus, Riese, Sanderman, & Ormel, 2014). Due to the PH, which is a frequent or ‘constant’ stress response, people with high levels of anxiety often present ‘round up’ or agitated.

Anxiety disorders

According to the American Psychiatric Association (APA, 2013), typical anxiety responses can accumulate to an anxiety disorder when the anxiety symptoms are disproportionate to the actual danger or threat, are increasing and become permanent. This differentiates an anxiety disorder from the usual fear and anxiety that is experienced by every person in daily life to some degree. Anxiety disorders are believed to arise from specific psychological characteristics that result from genetic and neurobiological factors that interact with social factors (Hassink-Franke et al., 2012). This includes hypersensitivity to stress and the tendency to experience strong negative emotions (nervousness, sadness, anger), which implies high impact on quality of life.

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association (APA), 2013) distinguishes between different types of anxiety disorders. The most common anxiety disorders are phobias, followed by social anxiety disorder (SAD), generalized anxiety disorder (GAD) and panic disorder (PD) (Anxiety and Depression Association of America [ADAA], 2018). Phobias refer to anxiety that is related to a specific stimulus, such as heights or spiders, often exist isolated and therefore usually don't affect daily life in general. Other anxiety disorders usually have an impact on daily life, which is illustrated by the description of the main symptoms, based on DSM-5 classification (APA, 2013):

- People with SAD have a general intense anxiety towards social or performance situations. They worry that actions or behaviours associated with their anxiety will be negatively evaluated by others, leading them to feel embarrassed. This worry often causes people with social anxiety to avoid social situations. Social anxiety disorder can manifest in a range of situations, such as within the workplace or the school environment.
- People with GAD suffer from excessive anxiety or worry about a number of things such as personal health, work, social interactions, and everyday routine life circumstances. The anxiety can cause significant problems in areas of their life, such as social interactions, school and work.
- People with PD experience recurrent unexpected panic attacks. Panic attacks are sudden periods of intense anxiety that occur quickly and reach their peak within minutes. Attacks can occur unexpectedly or can be brought on by a trigger, such as a feared object or situation. People with panic disorder often worry about when the next

attack will occur and actively try to prevent future attacks by avoiding places, situations or behaviours they associate with panic attacks. Worry about panic attacks, and the effort spent trying to avoid attacks, cause significant problems in various areas of the person's life and may e.g. include the development of agoraphobia: fear for situations outside the home where leaving might be difficult or impossible in case they have panic-like reactions or other embarrassing symptoms.

Although the anxiety disorders may have different triggers, they share underlying features (Cisler, Olatunji, Feldner, & Forsyth, 2010; Rosellini, Boettcher, Brown, & Barlow, 2015). An important feature that applies to all anxiety disorders is the exaggerated cognitive appraisal that is associated with the threatening situation: hyper-alert cognitive schemas lead to pathological anxiety (Beck & Haigh, 2014). Emotions are functional in daily life, guiding our attention to what is important and function as a signal to take action (Frijda, 1986). Emotions therefore support adaptive functions (Fresco, Mennin, Heimberg, & Ritter, 2013), although the cognitive labelling of the emotion is not always functional. Individuals with anxiety are believed to experience high levels of subjective emotional intensity (Mennin, Heimberg, Turk, & Fresco, 2005).

Emotions and the regulation of emotions are part of a larger self-regulation system. Self-regulation, the ability to adapt behaviour to changes in the internal and external environment, is defined by Blair and Diamond (2008) as a dynamic process, influenced by behavioural, cognitive and emotional aspects. The individual uses cognitive processes to adjust and adapt emotions and behaviour, in order to maintain positive social relationships, productivity, achievement, and a positive sense of self (DIjkhuis, Ziermans, Van Rijn, Staal, & Swaab, 2017). Self-regulation is considered to consist of three components: stress regulation, cognitive regulation and emotion regulation (or social regulation). These three components influence each other through the overlap in the neurobiological systems involved. Anxiety disorders are associated with dysfunctions in self-regulation (Mennin, Heimberg, Fresco, & Ritter, 2008; Levine, Fleming, Piedmont, Cain, & Chen, 2016).

Prevalence and impact of anxiety disorders

Nearly 29% of the population will be affected by an anxiety disorder somewhere in life (Kessler, Berglund, Demler, Jin, Merikangas, & Walters, 2005). It is estimated that 12,5 % of

women (one out of eight) and 7,7 % of men (one out of thirteen) in the Netherlands suffer from anxiety disorders (Dutch National Institute for Public Health and the Environment, 2017a). Anxiety disorders rank the second highest in terms of 'Years Lost' due to Disabilities (YLDs). The sum of YLDs, for people living with a health condition or its consequences, together with Years of Life Lost (YLL) due to premature mortality in the population, is a measure of Disability-Adjusted Life Years (DALYs). One DALY represents one lost year of "healthy" life and is a measure of the burden of disease; "the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability" (WHO, 2019). In the Dutch DALY order, anxiety disorders are the fifth, behind coronary heart diseases, strokes, diabetes and COPD (Dutch National Institute for Public Health and the Environment, 2018).

The presence of an anxiety disorder is associated with a lower quality of life and a negative impact on psychosocial functioning (Cramer, Torgersen, & Kringlen, 2005; Mendlowicz & Stein, 2000). People with high levels of anxiety symptoms often show comorbidity: more than half of the people with anxiety disorders also suffer from symptoms of depression (Dutch National Institute for Public Health and the Environment, 2017b).

In 2015, the costs of care for anxiety disorders in the Netherlands amounted to 807 million euro. In reality this amount may be (much) higher, since a considerable part of the costs spent on psychological disorders cannot directly be attributed to a diagnostic group (Dutch National Institute for Public Health and the Environment, 2018) and there are other related societal costs such as sick-leaves, job loss, etc., that are not included in the estimation.

From the low percentage of people with GAD that receives treatment, which is only 43,5%, one can conclude that signalling and treatment can be improved. According to the Anxiety and Depression Association of America (ADAA), nearly 36% of people with SAD report experiencing symptoms for 10 or more years before seeking help (ADAA, 2018). In conclusion, the negative impact of anxiety disorders on quality of life is significant.

Treatment of anxiety

When a patient presents with anxiety symptoms, a general practitioner in the Netherlands follows a stepped-care treatment as prescribed by the *Nederlands Huisartsen Genoodschap* (NHG) in the NHG Standard for Anxiety treatment (Hassink-Franke et al., 2012). This stepped-

care treatment of anxiety consists of successively: psycho-education, CBT, pharmacotherapy or a combination of CBT and pharmacotherapy.

CBT is an evidence-based intervention for anxiety, focusing on the cognitive labelling. Originally introduced over 50 years ago by Aaron Beck (Beck, 1963; 1964; 1976), CBT aims to directly alter dysfunctional ways of thinking (e.g. irrational or automatic thoughts) and by that changing dysfunctional behavioural patterns or attitudes (Hofmann, Asmundson, & Beck, 2013; Carpenter, Andrews, Witcraft, Powers, Smits, & Hofmann, 2018). CBT is based on the theory that individuals can become more functional and adaptive by intentionally modifying their cognitive and behavioural responses to the circumstances they face (Dobson & Dobson, 2009; Dobson & Dozois, 2010). CBT is a structured, collaborative process that helps individuals to consider both the accuracy and usefulness of their thoughts through processes of exploration, examination and experimentation (Hollon & Dimidjian, 2009). According to Beck & Dozois (2011, p. 400): "*patients learn how to become scientific investigators of their own thinking—to treat thoughts as hypotheses rather than as facts and to put these thoughts to the test. Patients learn to modify their thoughts so that they are congruent with existing evidence. They learn to shift their cognitive appraisals from ones that are unhealthy and maladaptive to ones that are evidence-based and adaptive"*.

The CBT intervention for anxiety aims to change maladaptive beliefs about the probability and magnitude of the anticipated harms by using behavioural (exposure) and various cognitive techniques (e.g. altering dysfunctional thoughts) (Hofmann & Smits, 2008; Smits, Julian, Rosenfield, & Powers, 2012). A recent systematic review in which the efficacy of CBT for anxiety-related disorders was examined, included 2843 patients (41 placebo-controlled trials) and showed small to moderate effects of CBT on anxiety symptoms and quality of life (Carpenter et al., 2018). Exposure strategies led to higher treatment success compared to cognitive or combined cognitive and behavioural intervention techniques. The authors conclude that since treatment effects are small to moderate, improvement of intervention can possibly be gained by exploring other treatment methods, especially for SAD and PD (Carpenter et al., 2018).

Pharmacotherapy encompasses treatment with benzodiazepines, antidepressants, anxiolytics, antipsychotics or antiepileptics, with the overall aim of suppressing the physical sensations and feelings of anxiety and panic.

Despite the proven effectiveness of CBT and pharmacotherapy (Hooke & Page, 2006; Pohl, Feltner, Fieve & Pande, 2005; Hofmann & Smits, 2008; Kjenisted & Bleau, 2004), it is estimated that 30%–60% of patients do not benefit from these interventions and still suffer from serious anxiety symptoms after treatment (Heldt, et al., 2003; Tyrer, Seivewright, & Johnson, 2004; Linden, Zubraegel, Baer, Franke, & Schlattmann, 2005; Zou, Ding, Flaherty, & Dong, 2013; Pelissolo, 2008; Katzman et al., 2014). Although generalized anxiety disorder (GAD) is associated with substantial personal and societal costs, the treatment success of GAD is lower than other anxiety disorders (Newman, Llera, Erickson, Przeworski, & Castonguay 2013). Possible explanations for lower treatment success are illustrated by a study on GAD, which showed that protocols are not always followed very well and that evidence-based treatments may not work for all subgroups (Van der Heiden, 2016). Furthermore, anxiety disorders have a recurrence rate of 54.8% within four years, (Scholten et al., 2016).

When all steps of the stepped care treatment are taken and have not resulted in sufficient treatment effects, 'the handicap model' can be applied (Van Balkom et al., 2013). This includes low-frequency contacts with the emphasis on guidance, explanation and preventing complications in different areas of daily functioning, to support quality of life. Supporting interventions aim at reducing the influence of anxiety on personal functioning and reducing impending factors for psychological and pharmacological interventions (Van Balkom et al., 2013; Hassink-Franke et al., 2012).

The arts therapies are classified as supportive interventions, according to the Multidisciplinary Guideline on Anxiety Disorders.

Art therapy

The domain of arts therapies include visual art therapy (referred to as art therapy), music therapy, dance/movement therapy, drama/speech therapy and psychomotor therapy (Federatie Vaktherapeutische Beroepen [FVB], 2018). The *Zorginstituut Nederland* (ZiN, National Health Care Institute) concluded in 2015 that the effectiveness of the arts therapies is insufficiently studied and that evidence for effectiveness of the therapies is largely lacking (Borgesius & Visser, 2015). However, the Trimbos Institute, the Dutch institute on mental health research, describes the arts therapies interventions as ''potentially effective treatments" that should be evaluated further (Van Balkom et al., 2013).

Art therapy, the subtype of the arts therapies that uses the visual arts (e.g. painting, drawing, sculpting, clay modelling), is an experience-oriented therapy and is provided in clinical practice as standalone therapy or in multidisciplinary treatment programs for anxiety disorders.
Within the multidisciplinary guideline (Van Balkom et al., 2013), art therapy is not part of the recommended treatments, because the evidence of effectiveness of art therapy for anxiety disorders cannot easily be judged, due to a lack of studies. Art therapy is considered an important supportive, but yet insufficient studied intervention for mental illness in general (Van Balkom et al., 2013). This is one of the reasons that art therapy is currently classified as supporting intervention, although art therapists, based on their clinical experiences, state that art therapy is not only supportive but may also directly reduce anxiety symptoms

Perceived working mechanisms

Based on clinical experience it is stated by art therapists that, because of its non-verbal character, art therapy can be suitable for individuals with anxiety, especially if they have difficulty in cognitive (re)labelling of their feelings, or if the opposite is the case: individuals that are very focused on cognitive labelling and use rationalizing as a psychological coping mechanism to deal with their anxiety (Gold, Vorack, & Wigram, 2004; Smeijsters, 2008). Moreover, the non-verbal AT approach is considered to be suitable for individuals with high levels of anxiety, since talking about anxiety and traumas can evoke fear and associated physical reactions (Posthuma, 2001). It is stated that 'distance to the anxiety' can be provided when creating visual artwork. To 'distance' oneself from the emotion during the act of creating art is believed to improve cognitive regulation of emotions (Smeijsters, 2008). The supposed mechanism is that during the process of creating an artwork, one can experience a feeling of being 'in control', which helps to counterbalance the overwhelming experience of anxiety (Van Gerven, 1996). Some studies have indicated a possible stress regulating effect of AT, by stimulating a 'flow-like' state of mind that is attributed to relaxation (e.g. Kaimal, Ray, & Muniz, 2016; Sandmire, Gorhan, Rankin, & Grimm, 2012). This implies that self-regulating processes may play a role in the reduction of anxiety symptoms through art therapy. However, the assumptions of working mechanisms seem to be merely based on anecdotal evidence and expertise and need further substantiation.

Art therapy has a variety of subtypes, that are based on various perspectives from psychoanalysis, cognitive-analytic therapies, compassion-focused therapy, attachment-based psychotherapy and client-centered approaches, like mindfulness and mentalization-based treatments (British Association of Art Therapists [BAAT], 2018).

Anthroposophic art therapy

One of the AT variants with a client-centred approach and similarities with mindfulness-based treatments is anthroposophic art therapy (AAT). AAT is used in 28 countries (Hamre et al., 2009) and was developed by Dr. Margarethe Hauschka in the beginning of the 20th century as a part of anthroposophic medicine (Box 1) (Hauschka, 2004).

Box 1. Anthroposphic Medicine

ANTHROPOSOPHIC MEDICINE *is an integrative diagnostic and therapeutic concept, developed from 1921 onwards, as an addition to conventional healthcare and is practiced today in over 60 countries. It is based on Rudolf Steiner's anthroposophy (IVAA, 2018), in which a human being is considered as a whole entity of body, mind/ soul, and individuality (Baars, Kiene, Kienle, Heusser, & Hamre, 2018). AM integrates conventional medicine with additional treatments, such as anthroposophical pharmacotherapy, massage therapy and arts therapies (visual arts, music, speech/drama and dance (eurhythmy)) (IVAA, 2018; Kienle, Albonico, Baars, Hamre, Zimmerman, & Kiene, 2013; Baars & Hamre, 2017).*

The Dutch association of anthroposophic art therapists (Nederlandse Vereniging voor Kunstzinnige Therapieën [NVKT]) describes AAT as follows: "In AAT, specific artistic exercises are used that are supposed to provide new experiences and insights, and create an entrance for working on health and personal development" (NVKT, 2018).

AAT (Box 2) is primarily an individual therapy, used in somatic and mental healthcare. The therapy is in line with the concept of 'positive health', in which health is not seen as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity", as defined by the World Health Organization (WHO, 2006), but as the ability to adapt and self-manage (Huber et al., 2011) or, in other words: the ability of people to self-regulate physical, emotional and social life challenges. In this current definition of health, not only the physical and mental functioning is part of health, but also meaningfulness (a spiritual / existential dimension), quality of life (well-being, experiencing happiness, enjoying, balance)

Box 2. Anthroposophic Art Therapy

ANTHROPOSOPHIC ART THERAPY *uses an expressive approach (expression of emotions, feelings and thoughts), combined with an 'impressive' or inwardly oriented approach (Uitgeest, 2016). The client is guided to (sub- or unconsciously) express feelings and life experiences. The therapist provides structured artistic exercises with the therapeutic aim of improving the health and resilience of the individual. These exercises are often structured and provide ''impressions'': profound experiences of color and shape. The underlying idea is that these impressions have both psychological and physiological effects and activate the self-regulating ability of the client (Christeller et al., 2000; Hauschka, 2004; Rolff & Gruber, 2015).*

and social participation (meaningful relationships, social contacts, being accepted, social involvement, meaningful work).

Although AAT has a long history and is developed through experience and clinical expertise, the evidence of its effectiveness and efficacy is unclear.

Evidence based practice

Since the 1990s, healthcare has been increasingly influenced by the development of evidence-based medicine (EBM). EBM was defined in 1992 as 'the process of systematically searching, assessing and applying contemporary research outcomes as the basis for clinical decision-making' (Evidence-Based Medicine Working Group, 1992). In 1996, the definition by David Sackett was extended with a role for the clinical expertise of the healthcare professional and with a value judgment by the patient (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). Where the term EBM is reserved for medicine, the term evidence-based practice (EBP) is used for all care disciplines (e.g. psychotherapy, occupational therapy, physiotherapy, art therapy and speech therapy). EBP is about decision-making (Kuiper, 2004), and aims to encourage clinicians to make rational decisions based on three pillars (Lucas, 2015): 1) the patient's clinical condition and circumstances, 2) the patient's preferences and his behaviour in relation to the health problem, and 3) the best available external evidence for the treatment of the present clinical problem (Fig. I). The latter often means (but not exclusively) evidence obtained from scientific research. These aspects are integrated in the decision-making process (Lucas, 2015).

Figure I. Three pillars of evidence-based practice

Over the past decades, the emphasis within the EBP development has been increasingly on the third pillar: the quality of research results from effectiveness research and the standardization of care (protocols and guidelines). The vision behind this development was that if the tested, standardized care was delivered, for which the best quality scientific evidence was available, it could be ensured that the patient received the right care and that the costs could be controlled (Health Council, 1991; Lucas, 2015). EBP has been more and more implemented in healthcare practice in recent decades (in medicine) and has thus made a positive contribution to improving quality of care.

Evidence based practice in anthroposophic art therapy

What is the status of AAT, according to the EBP model?

The anthroposophic art therapist bases his/her actions mainly on the first and second pillar of EBP: (1) clinical expertise, and (2) the patient's preferences. With regard to clinical expertise, AAT has a long professional history of nearly 90 years and has developed a broad expertise that is transferred by expertise-based and practice-based book chapters, non-scientific publications and education. It is known that experts can treat complex and unique, context-specific problems through tacit knowledge, craftmanship or the 'clinical eye' (e.g. Snoek, 1993; Glas, 1997; Robertson, 2001). Experts have developed specific information processing skills: the intuitive recognition and application of a pattern ('Gestalt') (e.g. Van der Laan, 2006), leading often to appropriate conclusions and correct predictions (Baars, 2011).

With regard to patient preference, anthroposophic art therapists adjust their treatment to the individual patient continuously by monitoring and adapting the treatment process carefully. Therapists have learned to manage complex interventions, taking the individual context including the patients' physical, mental and social condition, current circumstances, values and preferences of the patient into account (Baars & Van der Bie, 2009). These competences are developed in education and are secured in a network organization through registration, quality criteria and supervision on national level (NVKT), EU level (European Academy for Anthroposophic Arts Therapies [EA]) and worldwide (ICAAT; IFAAET). This way of working, in which the therapeutic process is continuously adapted to the individual, is in line with the latest development in healthcare regarding *context-based practice* (Raad van Volksgezondheid en Samenleving [RVS], 2017).

For describing the status of the third pillar, there is a variety of methods and models to judge and categorize evidence from available research. One of these is the 'effect ladder' (Van Yperen & Veerman, 2008). The reported evidence of effectiveness of an intervention can be assessed with this effect ladder: the more evidence, the stronger the statement about the effectiveness. To be able to judge the current situation of the third pillar, the evidence in the area of AAT & anxiety, the different levels of evidence are described below and are summarized in Table I.

The status of AAT on level 1 is that there are some expert descriptions of AAT. A survey (Baars & Hoekman, 2013) amongst 350 Dutch AATs, indicated that treatment of anxiety was one of the best practices in AAT. The content of this AAT intervention for anxiety is described, based on interviews with six experts (therapists with a broad experience with adults with anxiety) combined with scholarly literature leading to a list of treatment objectives that are embedded in an individual treatment plan for a client with anxiety (Werkveldteam GGZ, 2015) (Box 3).

There is no clear description of the treatment for anxiety in the structure of a complete treatment plan, because the intervention is tailored to the individual patient, but there are descriptions of specific exercises that are indicated for patients with anxiety (Box 3).

On level 2, supposed working mechanisms of the therapy in general are described to a limited extent. Examples are textbooks of AAT (e.g. Christeller, 2000, Hauschka, 2004). Hypothetical working mechanisms of some of the exercises in the treatment of anxiety are described by expert art therapists (Mees-Christeller, 1997; Avelingh, 1997) (Box 3), but these theories or hypotheses are currently not or hardly generally accepted and are not content-wise connected to research-supported theories.

On level 3 in the area of AAT, empirical studies have been carried out on a very limited scale. There is one cohort study on anxiety disorders (Hamre et al., 2007; 2009). Long-term reduction of anxiety symptoms and improvement of quality of life was reported. No control group was used.

No controlled trials are performed on AAT previously, so there is no level 4 research. If we broaden our scope to art therapy in general, we do find that over the last decade, art therapy has increasingly been studied, with some RCTs that aimed at the effectiveness of art therapy on anxiety symptoms. These outcomes will be discussed in the second chapter of this PhD thesis.

Box 3. AAT treatment for anxiety

AAT TREATMENT FOR ANXIETY:

Treatment goals *as described by AAT experts: relaxation; strengthen connection with oneself (own feelings and/or body); experience own boundaries; learn to take space; strengthening the objectivity ("coming into reality") and strengthen self-confidence.*

Specific exercises *that are indicated for patients with anxiety involve observational drawing, form drawing and light-dark exercises with charcoal (Mees-Christeller & Mees, 2009). Clay modeling of platonic solids is regularly used in people with anxiety disorders (Mees-Christeller, 1997; Avelingh, 1997; Baumgart, 2015; Essink, 2016; Geuskens, 2014; Van der Lek, 2013).*

Rationale behind the exercises, *described by expert art therapists (Mees-Christeller, 1997; Avelingh, 1997), can be summarized as follows: drawing from observation, e.g. objects or images from nature, asks for concentration and preciseness and aims to enable the patient to connect with reality. Drawing in perspective can provide a feeling of space, and the patient needs to take a position in different points of view. Drawing with charcoal (light-dark exercises) asks for courage and is thought to work into the bodily experiences, providing a feeling of warmth: "Fears are overcome in the harmonization of light and darkness" (Mees-Christeller & Mees, 2009, p.31). Clay modelling of animal and human forms requires a certain amount of solidity and is thought to provide an experience of affluence through the beauty and fullness of natural, vital shapes. Clay modelling of platonic solids is used in the treatment when clarity of mind is needed. This specific exercise requires concentration and carefulness, constantly correcting to find the right proportions of the mathematical forms. This is thought to strengthen the objectivity.*

Table I. Summary of evidence according to the effect ladder

Level	Nature of evidence	Based on	Current status of AAT for anxiety
4. Is the intervention proven effective?	Causal => *proven effective*	Comparative research	Non-existent
3. Is the intervention effective in practice?	Indicative => *preliminary effective*	Description, intervention theory and effect measures	One cohort study was performed and showed long term reduction of anxiety symptoms and improvement of QoL (Hamre et al., 2007; 2009).
2. Is the intervention effective in theory?	Theoretical => *promising*	Description and credible intervention theory (mechanisms)	Hypothetical working mechanisms are described, but are not research-based and are not connected to generally accepted theories.
1. Is the intervention well described?	Descriptive => *potential*	Description of intervention (target group, means, outcomes) and context	Therapy settings and specific artistic exercises are described in scholarly literature. Treatment goals and best practices are described, based on expert interviews and a survey (Werkveldteam GGZ, 2015; Baars & Hoekman, 2013).
0. Is the intervention implicit (black box)?	None => *implicit*	Expert knowledge	AATs treat clients mainly based on implicit knowledge. What they do exactly is described to a limited extent (Abbing & Baars, 2012).

Problem definition

To conclude from Table I, the evidence on the effectiveness of AAT in the treatment of anxiety is mainly at level 1, and AAT can thus be classified as an intervention with potential. The intervention is based on clinical expertise. Anthroposophic art therapists consider their intervention to be theory-driven, because it is based on theories from the anthroposophic worldview, but the specific AAT theory is not well described and not connected to general accepted theories. It can thus not be defined as a promising intervention (yet), because studies supporting level 2 are missing. With one study at level 3, there is some preliminary evidence for the effectiveness of AAT. AAT is not proven effective, because level 4 studies are lacking.

Why is scientific research in this domain scarce? An explanation can be found in the lack of a research tradition within the profession. To start with, AAT therapists are not used to contribute to research. Therapeutic processes are not systematically described and gathered, so therapists are not able to provide data for research (Abbing & Baars, 2012). Therapists lack time, financial resources, knowledge and research skills that are needed to perform good quality research (Baars, 2008). Moreover, there are factors that complicate research in AAT.

To start with, AAT is a complex intervention. Complex interventions are interventions that contain different components that interact with each other, and other characteristics that researchers need to include in setting up and conducting research. This includes, among other things, the number of interacting components, the number and the difficulty of the actions of the care provider and the client to be deployed, and the degree of flexibility or permitted adjustment of the intervention (Craig, 2013). For art therapy it is not only the client-therapist interaction that plays a role in the treatment, but also the interaction between client, art process and artwork. This is a process which contains many factors, most of them yet unknown. The anthroposophic background of AAT makes that a care professional works 'holistic' and pays attention to biological, physiological, socio-psychological and meaningful (spiritual) aspects of the client's condition. This too makes the AAT intervention complex, and complex interventions that involve many different dynamic factors cannot easily be evaluated using standard randomized controlled trial (RCT) designs. For complex interventions, other research methods are needed alongside RCTs. This is also described in a recent publication of the *Raad van Volksgezondheid en Samenleving* ([RVS] 2017), stating that the knowledge that RCTs provide is a reduction of reality. RCTs do not sufficiently take into account differences between patients and their personal values, with variety in implementation practices, and with the dynamic setting in which care takes place. The best thing to do can differ per patient and situation. The decision-making process, related to a specific client and a specific context, is an experiment in which different knowledge sources are connected. These knowledge sources include clinical expertise, local knowledge, knowledge from the patient and the context and values that are at stake. "Embracing the uncertainty and integrating different sources of knowledge within the specific context in which care is provided requires a more active role than that of the passive 'evidence user' " (RVS, 2017). This approach provides a base for case-based learning and application of case study methodology that supports professional decision-making in individualizing care approaches.

How should AT, as a complex intervention, be studied? Even though it is not easy, RCTs are needed in the area of AT because this design is 'the gold standard' for assessing the effectiveness of interventions. For known best practices (based on expert experiences), RCTs should be designed with preservation of the complex intervention, studying the realistic clinical practice. RCTs can also be used to test hypotheses of working mechanisms. These hypotheses need to be provided first through other research methods or can arise from expert

experience, practice knowledge and literature. Case studies, leading to case reports, are aimed at explicating expert experience and provide insight in the individualized approach that is used in AAT, and are therefore suitable for describing the content of the therapy, generating hypothesis on working mechanisms, and providing the first indications for evaluation of effectiveness.

Summarizing, the individualized approach in providing care to patients is supposed to be a strong feature of AAT: therapists have developed the knowledge and skills to adapt treatment to the individual patient and his/her relevant context. An important weakness is that there is hardly any good quality evidence of the effectiveness of AAT and its working mechanisms. In order to gain insight in the supposed value of AAT and the justification of the place of AAT in healthcare, high quality empirical research is needed. For the development of EBP in this profession, it is needed to investigate *if* AAT works and *how* it works. Besides, in order to support the growth of the body of evidence, therapists need to be supported in evaluating their work. Research in practice should be enabled by means of developing feasible data collection methods and research methods that are closely related to practice.

Research questions and outline

The main research question is: *Is there evidence for the effectiveness of art therapy in the treatment of anxiety in adults and which working mechanisms of anthroposophic art therapy can be identified?*

The hypothesis is that art therapy reduces anxiety symptom severity and improves quality of life and aspects of self-regulation.

This PhD thesis consists of an **effectiveness research section** (PART I, chapters 2, 3 and 4), aimed at studying the effectiveness of AT and AAT in the treatment of anxiety (disorders) and at the identification of factors that contribute to anxiety reduction, leading to hypotheses of working mechanisms for further research, and a **practice-based research section** (PART II, chapters 5 and 6), with the central question how case reports in AAT can be used in research. This part of our research was aimed at the development of a systematic data collection method and at development of a research method for AAT that supports description of the content of AAT and exploration of working mechanisms (case reporting).

The research questions, aims and methods are presented in Table II.

Table II. Overview of the studies

	RESEARCH QUESTION	AIM	METHOD
PART I – Effects of art therapy in the treatment of anxiety in adults			
Chapter 2	*What is the evidence so far of art therapy effectiveness in the treatment of anxiety in adults?*	To gain overview of evidence, benefitting populations, therapy characteristics and working mechanisms of art therapy for adults with (primary) anxiety.	Systematic review of RCTs and nRCTs
Chapter 3	*What is the effectiveness of three months AAT in women with anxiety disorders?*	To evaluate the effects of AAT on anxiety symptoms, quality of life and emotion regulation.	RCT comparing (1) a weekly individual AAT of 10-12 sessions to (2) a waiting list group.
Chapter 4	*What is the effectiveness of AAT on aspects of self-regulation and what factors contribute to anxiety reduction?*	To evaluate the effects of AAT on executive functioning and stress regulation; to explore if the working mechanism of AAT in anxiety can be explained by these factors.	RCT comparing (1) a weekly individual AAT of 10-12 sessions, to (2) a waiting list group.
PART II– Towards further hypotheses on working mechanisms of AAT: development of case report methodology for AAT			
	RESEARCH QUESTION	**AIM**	**METHOD**
Chapter 5	*Can the medical Case Report Guidelines be adjusted for use in AAT?*	To develop a case report guideline for AAT.	Qualitative design: document analyses, literature study, survey, focus groups.
Chapter 6	*How does AAT work on reduction of anxiety? What therapeutic elements may be connected to emotion regulation en executive functions?*	To provide insight in the therapeutic process of AAT in the treatment of anxiety, and to provide hypotheses for a theoretical framework.	Case study. Case report, written according to the CARE-AAT Guideline.

PART I – Effects of art therapy in the treatment of anxiety in adults

The first aim of our research was to review the existing effectiveness of art therapy for anxiety disorders and to study the effectiveness of AAT for anxiety (disorders). **Chapter 2** provides a systematic review of the evidence of effectiveness for AT in the treatment of anxiety. Chapters 3 and 4 originate from a RCT on the effects of AAT in women with anxiety disorders. In **Chapter 3** the effects of AAT on anxiety level, quality of life and emotion regulation are reported. **Chapter 4** addresses the effects of AAT on psychophysiological and neuropsychological anxiety

related parameters, and on the extent to which anxiety reduction is associated with change in these parameters, leading to preliminary hypotheses on the working mechanisms of AAT.

PART II – Towards further hypotheses on working mechanisms of AAT: development of case report methodology for art therapy

The second aim of our research was to contribute to the development of practice-based research in AAT, to support art therapists in contributing to the body of knowledge and the body of evidence.

Case reports can provide insight in therapeutic processes and open up the black box of art therapy. This creates the possibility for exploration and systematic description of the supposed working mechanisms, leading to hypotheses that can be tested in more controlled studies such as RCTs. Part II of this PhD thesis therefore focusses on the development of case report methodology for AAT and the application of this methodology. **Chapter 5** describes the development of a publication guideline for AAT case reports, based on the already existing medical CARE Guidelines (Gagnier et al., 2013). **Chapter 6** is a case description and aims to provide insight in the course of treatment that led to anxiety reduction in an individual case and explores the supposed role of regulating processes within this specific intervention process. It concerns a case report, of which the data from one therapeutic process was collected with the use of a previous developed documentation method for therapeutic processes in AAT (Abbing, Ponstein, Hoekman, van Hooren, & Baars, 2018). The case report is subsequently written according to the developed publication guideline.

Case reports, written following the guideline, have many benefits, according to the CARE group (www.care-statement.org): patients can review transparent information on therapeutic options; clinicians can improve peer-to-peer communication; researchers can use testable hypotheses from clinical settings (Driggers et al., 2016) and educators have examples to support case-based learning. Chapters 5 and 6 are also intended to provide the professionals with an example how the individual stories from practice can find their way to systematic scientific analysis.

In **Chapter 7** *Summary and Discussion*, the key points of the various chapters are brought together and findings are evaluated.

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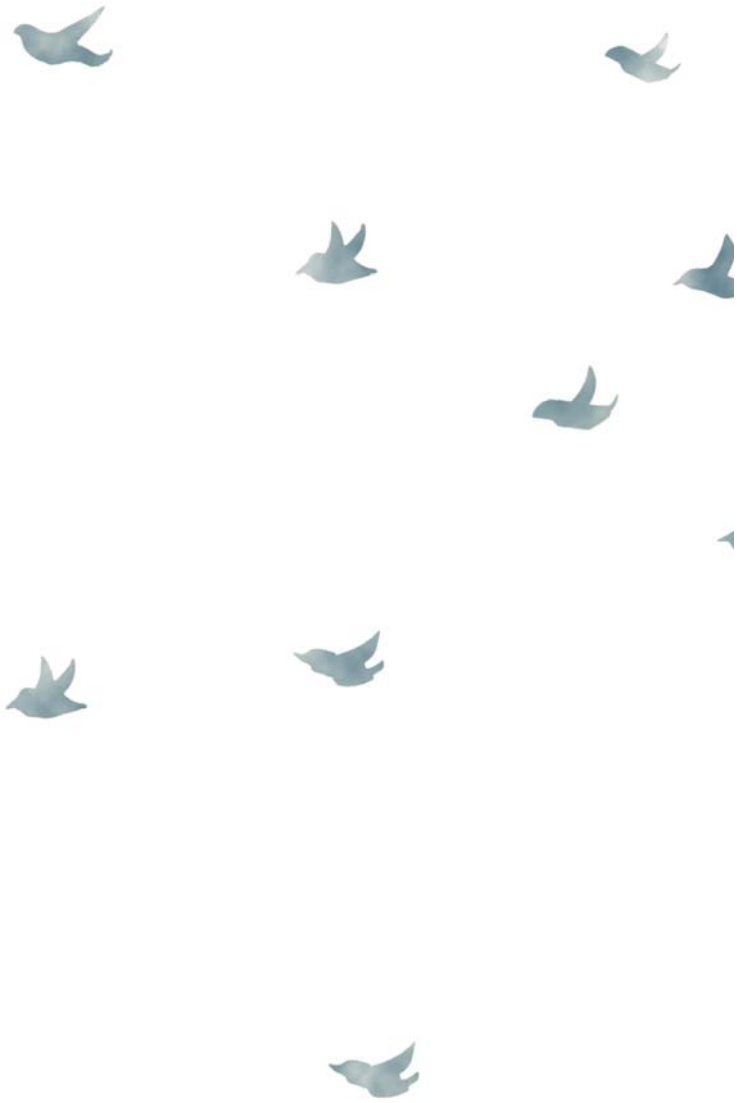
PART I

Effectiveness of art therapy

in the treatment of anxiety in adults

“The therapy gave me the insight that there are other ways to deal with problems and with how you feel, instead of always wanting to understand it through thinking. Understanding does not guarantee that it will pass. I always thought so, but that is a misconception.”
(Female participant of the RCT, 49 years old)



Chapter 2

The effectiveness of art therapy for anxiety in adults: a systematic review of randomised and nonrandomised controlled trials

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Abstract

Background: Anxiety disorders are one of the most diagnosed mental health disorders. Common treatment consists of cognitive behavioural therapy and pharmacotherapy. In clinical practice, also art therapy is additionally provided to patients with anxiety (disorders), among others because treatment as usual is not sufficiently effective for a large group of patients. There is no clarity on the effectiveness of art therapy (AT) on the reduction of anxiety symptoms in adults and there is no overview of the intervention characteristics and working mechanisms.

Methods: A systematic review of (non-)randomised controlled trials on AT for anxiety in adults to evaluate the effects on anxiety symptom severity and to explore intervention characteristics, benefitting populations and working mechanisms. Thirteen databases and two journals were searched for the period 1997 – October 2017. The study was registered at PROSPERO (CRD42017080733) and performed according to the Cochrane recommendations. PRISMA Guidelines were used for reporting.

Results: Only three publications out of 776 hits from the search fulfilled the inclusion criteria: three RCTs with 162 patients in total. All studies have a high risk of bias. Study populations were: students with PTSD symptoms, students with exam anxiety and prisoners with prelease anxiety. Visual art techniques varied: trauma-related mandala design, collage making, free painting, clay work, still life drawing and house-tree-person drawing. There is some evidence of effectiveness of AT for pre-exam anxiety in undergraduate students. AT is possibly effective in reducing pre-release anxiety in prisoners. The AT characteristics varied and narrative synthesis led to hypothesized working mechanisms of AT: induce relaxation; gain access to unconscious traumatic memories, thereby creating possibilities to investigate cognitions; and improve emotion regulation.

Conclusions: Effectiveness of AT on anxiety has hardly been studied, so no strong conclusions can be drawn. This emphasizes the need for high quality trials studying the effectiveness of AT on anxiety.

Introduction

Anxiety disorders are disorders with an 'abnormal' experience of fear, which gives rise to sustained distress and/ or obstacles in social functioning (Hassink-Franke, van Heest, Hekman, van Marwijk & van Avendonk, 2012). Among these disorders are panic disorder, social phobia, agoraphobia, specific phobia, obsessive-compulsive disorder (OCD) and generalized anxiety disorder (GAD). The prevalence of anxiety disorders is high: 12.0% in European adults (Wittchen et al., 2010) and 10.1% in the Dutch population (De Graaf, ten Have, van Gool & van Dorsselaer, 2011). Lifetime prevalence for women ranges from 16.3% (Kessler, Dupont, Berglund & Wittchen, 1999; Wittchen et al., 2010) to 23.4% (De Graaf et al., 2011) and for men from 7.8% to 15.9% (De Graaf et al., 2011; Wittchen et al., 2010) in Europe. It is the most diagnosed mental health disorder in the US (Kessler, Chiu, Demler & Walters, 2005) and incidence levels have increased over the last half of the 20th century (Twenge, 2000).

Anxiety disorders rank high in the list of burden of diseases. According to the Global Burden of Disease study (Baxter, Vos, Scott, Ferrari & Whiteford, 2014), anxiety disorders are the sixth leading cause of disability, in terms of years lived with disability (YLDs), in low-, middle- and high-income countries in 2010. They lead to reduced quality of life (Mendlowicz, 2000) and functional impairment, not only in personal life but also at work (Kessler et al., 1999; Aderka, Hofmann, Nickerson, Hermesh, Gilboa-Schechtman & Marom, 2012; Naragon-Gainey, Gallagher & Brown, 2013) and are associated with substantial personal and societal costs (Konnopka, Leischenring, Leibing & König, 2009).

The most common treatments of anxiety disorders are cognitive behavioural therapy (CBT) and/ or pharmacotherapy with benzodiazepines, tricyclic antidepressants, monoamine oxidase inhibitors and selective serotonin reuptake inhibitors (Hassink-Franke et al., 2012). These treatments appear to be only moderately effective. Pharmacological treatment causes side effects and a significant percentage of patients (between 20-50%) is unresponsive or has a contra-indication (Blanco et al., 2010; Davidson et al., 2004; Hyman, 2010; Lydiard, Brawman-Mintzer & Ballenger, 1996). Combination with CBT is recommended (Bandelow et al., 2012) but around 50% of patients with anxiety disorders do not benefit from CBT (Nielsen et al., 2018).

To increase the effectiveness of treatment of anxiety disorders, additional therapies are used in clinical practice. An example is art therapy (AT), which is integrated in several mental health care programs for people with anxiety (e.g. Droždek & Bolwerk, 2010; Droždek, Kamperman, Bolwerk, Tol & Kleber, 2012) and is also provided as a stand-alone therapy. AT is considered an important supportive intervention in mental illnesses (Öster et al., 2006; GGz Nederland, 2012; Van Balkom, Emmelkamp, Bockting, Spijker, Hermens & Meeuwissen, 2013), but clarity on the effectiveness of AT is currently lacking.

AT uses fine arts as a medium, like painting, drawing, sculpting and clay modelling. The focus is on the process of creating and (associated) experiencing, aiming for facilitating the expression of memories, feelings and emotions, improvement of self-reflection and the development and practice of new coping skills (GGz Nederland, 2012; Malchiodi, 2003; Schweizer, de Bruyn, Haeyen, Henskens, Visser & Rutten-Saris, 2009).

AT is believed to support patients with anxiety in coping with their symptoms and to improve their quality of life((Öster et al., 2006). Based on long-term experience with treatment of anxiety in practice, AT experts describe that AT can improve emotion regulation and self-structuring skills (Eren, Öğünç, Keser, Bikmaz, Şahin & Saydam, 2014; Haeyen, 2005; Morgan, Knight, Bagwash & Thompson, 2012) and can increase self-awareness and reflective abilities (Bateman & Fonagy, 2004; Ouwens et al., 2007). According to Haeyen, van Hooren & Hutschemakers (2015), patients experience a more direct and easier access to their emotions through the art therapies, compared to verbal approaches. As a result of these experiences, AT is believed to reduce symptoms in patients with anxiety.

Although AT is often indicated in anxiety, its effectiveness has hardly been studied yet. In the last decade some systematic reviews on AT were published. These reviews covered several areas. Some of the reviews focussed on PTSD (Nanda, Barbato Gaydos, Hathorn & Watkins, 2010; Schouten, de Niet, Knipscheer, Kleber & Hutschemaekers, 2014; Ramirez, 2016; Williams & Thompson, 2010), or have a broader focus and include several (mental) health conditions (Uttely, Stevenson, Scope, Rawdin & Sutton, 2015; Slayton, D'Archer & Kaplan, 2010; Van Lith, 2016; Lankston, Cusack, Fremantle & Isles, 2010; Fenner, Abdelazim, Bräuninger, Strehlow & Seifert, 2017). Other reviews included AT in a broader definition of psychodynamic therapies (Fonagy, 2015) or deal with several therapies (CBTs, expressive art therapies (e.g., guided imagery and music therapy), exposure therapies (e.g., systematic

desensitization) and pharmacological treatments within one treatment program) (McGrath, 2012).

No review specifically aimed at the effectiveness of AT on anxiety or on specific anxiety disorders. For anxiety as the primary condition, thus not related to another primary disease or condition (e.g. cancer or autism), there is no clarity on the evidence nor of the employed therapeutic methods of AT for anxiety in adults. Furthermore, clearly scientifically substantiated working mechanism(s), explaining the anticipated effectiveness of the therapy, are lacking.

Objectives

The primary objective is to examine the effectiveness of AT in reducing anxiety symptoms.

The secondary objective is to get an overview of (1) the characteristics of patient populations for which art therapy is or may be beneficial, (2) the specific form of ATs employed and (3) reported and hypothesized working mechanisms.

Methods

Protocol and registration

The systematic review was performed according to the recommendations of the Cochrane Collaboration for study identification, selection, data extraction, quality appraisal and analysis of the data (Higgins & Green, 2011). The PRISMA Guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009) were followed for reporting (S1 Checklist). The review protocol was registered at PROSPERO, number CRD42017080733 (Abbing, Ponstein, Baars, Van Hooren, De Sonneville & Swaab, 2017). The AMSTAR 2 checklist was used to assess and improve the quality of the review (Shea et al., 2017).

Eligibility criteria

Types of study designs

The review included peer reviewed published randomised controlled trials (RCTs) and non-randomised controlled trials (nRCTs) on the treatment of anxiety symptoms. nRCTs were also included because it was hypothesized that nRCTs are more executed than RCTs, for the research field of AT is still in its infancy.

Only publications in English, Dutch or German were included. These language restrictions were set because the reviewers were only fluent in these three languages.

Types of participants

Studies of adults (18-65 years), from any ethnicity or gender were included.

Types of interventions

AT provided to individuals or groups, without limitations on duration and number of sessions were included.

Types of comparisons

The following control groups were included: 1) inactive treatment (no treatment, waiting list, sham treatment) and 2) active treatment (standard care or any other treatment). Co-interventions were allowed, but only if the additional effect of AT on anxiety symptom severity was measured.

Types of outcome measures

Included were studies that had reduction of anxiety symptoms as the primary outcome measure. Excluded were studies where reduction of anxiety symptoms was assessed in non-anxiety disorders or diseases and studies where anxiety symptoms were artificially induced in healthy populations. Populations with PTSD were not excluded, since this used to be an anxiety disorder until 2013 (American Psychiatric Association, 2000).

Searches

The following 13 databases and two journals were searched: PUBMED, Embase (Ovid), EMCare (Ovid), PsychINFO (EBSCO), The Cochrane Library (Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials, Database of Abstracts of Review of Effects, Web of Science, Art Index, Central, Academic Search Premier, Merkurstab, ArtheData, Reliëf, Tijdschrift voor Vaktherapie.

A search strategy was developed using keywords (art therapy, anxiety) for the electronic databases according to their specific subject headings or structure. For each database, search

terms were adapted according to the search capabilities of that database (S1 File Full list of search terms).

The search covered a period of twenty years: 1997 until October 9, 2017. The reference lists of systematic reviews - found in the search - were hand searched for supplementing titles, to ensure that all possible eligible studies would be detected.

Study selection

A single endnote file of all references identified through the search processes was produced. Duplicates were removed.

The following selection process was independently carried out by two researchers (AA and AP). In the first phase, titles were screened for eligibility. The abstracts of the remaining entries were screened and only those that met the inclusion criteria were selected for full text appraisal. These full texts were subsequently assessed according to the eligibility criteria. Any disagreement in study selection between the two independent reviewers was resolved through discussion or by consultation of a third reviewer (EB).

Data collection process

The data were extracted by using a data extraction spreadsheet, based on the Cochrane Collaboration Data Collection Form for intervention reviews (S1 Table Data collection form).

The form concerned the following data: aim of the study, study type, population, number of treated subjects, number of controlled subjects, AT description, duration, frequency, co-intervention(s), control description, outcome domains and outcome measures, time points, outcomes and statistics.

After separate extraction of the data, the results of the two independent assessors were compared and discussed to reach consensus.

Risk of bias in individual studies

The risk of bias (RoB) was independently assessed by the two reviewers with the Cochrane Collaboration's tool for assessing RoB (Higgins et al., 2011). Bias was assessed over the domains: selection bias (random sequence generation and allocation concealment), performance bias (blinding of participants and personnel), detection bias (blinding of researchers conducting outcome assessments), attrition bias (incomplete outcome data),

reporting bias (selective reporting). A judgement of ‘low’, ‘high’ or ‘unclear’ risk of bias was provided for each domain. Since the RoB tool was developed for use in pharmacological studies, we followed the recommendations of Munder & Barth (2017) that placed the RoB tool in the context of psychotherapy outcome research. Performance bias is defined here as "studies that did not use active control groups or did not assess patient expectancies or treatment credibility", instead of only 'blinding of participants and personnel'.

A summary assessment of RoB for each study was based on the approach of Higgins & Green (2011): overall low RoB (low risk of bias in all domains), unclear RoB (unclear RoB in at least one domain) and high RoB (unclear RoB in more than one domain or high RoB in at least one domain).

Outcomes

The primary outcome measure was anxiety symptoms reduction (pre-post treatment). The outcomes are presented in terms of differences between intervention and control groups (e.g., risk ratios or odds ratios). Within-group outcomes are also presented, to identify promising outcomes and hypotheses for future research.

Data from studies were combined in a meta-analyses to estimate overall effect sizes, if at least two studies with comparable study populations and treatment were available that assessed the same specific outcomes. Heterogeneity was examined by calculating the I^2 statistic and performing the Chi^2 test. If heterogeneity was considered relevant, e.g. I^2 statistic greater than 0.50 and $p<0.10$, sources of heterogeneity were investigated, subanalyses were performed as deemed clinically relevant, and subtotals only, or single trial results were reported. In case of a meta-analysis, publication bias was assessed by drawing a funnel plot based on the primary outcome from all trials and statistical analysis of risk ratios or odds ratios as the measure of treatment effect.

A content analysis was conducted on the characteristics of the employed ATs, the target populations and the reported or hypothesized working mechanisms.

Quality of evicence

Quality (or certainty) of evidence of the studies with significant outcomes only was was assessed with the Grading of Recommendations Assessment, Development and Evaluation

(GRADE) (Ryan, 2016). Evidence can be scored as high, moderate, low or very low, according to a set of criteria.

Results

2

Study selection

The search yielded 776 unique citations. Based on title and abstract, 760 citations were excluded because the language was not English, Dutch or German (n=23), were not about anxiety (n=164), or it concerned anxiety related to another primary disease or condition (n=175), didn't concern adults (18-65 years) (n=152), were not about AT (n=94), were not a controlled trial (n=131), or were lacking a control group (n=22) or anxiety symptoms were not used as outcome measure (n=1).

Of the remaining 16 full text articles, 13 articles were excluded. Reasons were: lack of a control group (Allen, Wozniak, 2010; Asawa, 2003; Heynen, Roest, Willemars & van Hooren, 2017; Kimport & Hartzell, 2015; Lande, Banks Williams, Francis, Gragnani & Morin, 2011), anxiety was related to another primary disease or condition (Swami, 2017; Selders, Visser, Van Rooij, Delfstra & Koelen, 2015), or the study population consisted of healthy subjects (Eaton & Tieber, 2017; Curry & Kasser, 2005), did not concern subjects in the age between 18-65 years (Kim, 2013), or was not peer-reviewed (Toroghi, 2015) or did not have pre-post measures of anxiety symptom severity (De Morais et al., 2014; Campbell, Decker, Kruk & Deaver, 2016). A list of all potentially relevant studies that were excluded from the review after reading full texts, is presented in S2 *Table Excluded studies with reasons for exclusion.* Finally, three studies were included for the systematic review (Fig 1).

Screening of references from systematic reviews

The systematic literature search yielded 15 systematic reviews. All titles from the reference lists of these reviews were screened (n=999), of which 27 publications were eligible for abstract screening and were other than the 938 citations found in the search described above (see Study selection). From these abstracts, 18 were excluded because they were not peer reviewed (n=3), not in English, Dutch or German (n=1), not about anxiety (n=2), or were about anxiety related to cancer (n=2), were not about AT (n=2) or were not a controlled trial (n=8).

Nine full texts were screened for eligibility and were all excluded. Six full texts were excluded because these concerned psychodynamic therapies and did not include AT (Andersson, 2012; Egger et al., 2015; Knijnik et al., 2009; Leichsenring et al., 2013; 2014). Two full texts were excluded because they concerned multidisciplinary treatment and no separate effects of AT were measured (Drozdek et al., 2010; 2012). The final full text was excluded because it concerned induced worry in a healthy population (Bell & Robbins, 2007). No studies remained for quality appraisal and full review. The justified reasons for exclusion of all potentially relevant studies that were read in full-text form, is presented in S2 *Table Excluded studies with reasons for exclusion*.

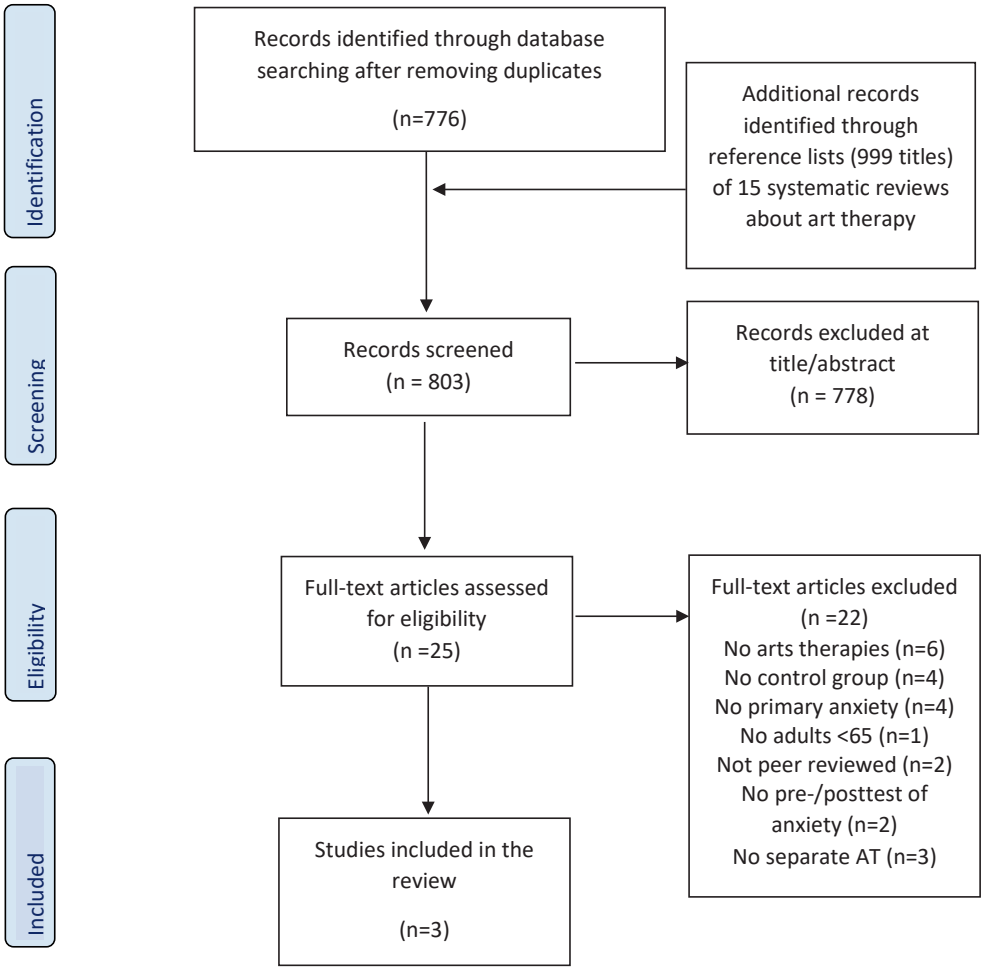

Figure I PRISMA Flow Diagram

Study characteristics

The review includes three RCTs. The study populations of the included studies are: students with PTSD symptoms and two groups of adults with fear for a specific situation: students prior to exams and prisoners prior to release. The trials have small to moderate sample sizes, ranging from 36 to 69. The total number of patients in the included studies is 162 (Table I).

Table I. Characteristics of the included studies of art therapy

Study author & year	Aim	Study type	Number (treated/ control)	Study population
Henderson et al. (2007)	To examine the healing aspects of creating mandalas on mental health (anxiety and PTSD symptoms).	RCT	36 (19/17)	Sex: male and female Age:18-23 Population: **undergraduate students** (US) with PTSD symptoms Exclusion: simultaneous psychotherapy or psychotropic medication
Sandmire et al. (2012)	To assess if art making leads to (significant) anxiety reduction, compared to a control group.	RCT	57 (29/28)	Sex: male and female Age: 18.8 (mean) Population: **undergraduate first year students** of a liberal arts college (US), a week prior to final exams Exclusion: anxiety disorder, use of medication known to influence the central nervous system (e.g. for depression or ADHD)
Yu et al. (2016)	To examine the feasibility of using HTP drawing therapy to reduce prisoners' prelease anxiety.	RCT	69 (33/36)	Sex: male Age: 18-60 Population: **prisoners** (China), to be released within the next 2 to 3 Months Diagnosis: none

In one study, AT is combined with another treatment: a group interview (Yu, Yu Ming, Yue, Hai Li & Ling, 2016). The other two studies solely concern AT (Table II) (Henderson, Rosen, Mascaro, 2007; Sandmire, Groham, Rankin & Grimm, 2012).

Table II. Characteristics of the interventions of included studies

Study author & year	Art therapy characteristics	Treatment duration, frequency, type (group or individual)	Co-interventions	Control group characteristics
Henderson et al. (2007)	Mandala creation (represent feelings or emotions related to personal trauma within the contour of a circle).	3 sessions; 20 minutes per session; 3 consecutive days (1 week); group therapy.	None	Active control: Three specific drawing assignments (not trauma related) of 20 minutes each.
Sandmire et al. (2012)	One choice out of five art- making activities: mandala design, free painting, collage making, free clay work and still life drawing; social interaction was allowed, no use of electronic devices.	1 session; 30 minutes; group therapy.	None	Inactive control: Sitting in comfortable chairs, social interaction was allowed, no use of electronic devices
Yu et al. (2016)	Drawing of at least a house, a tree and a person, followed by a group interview.	10 sessions; no set time for drawing; twice a week (5 weeks); group therapy; followed by group interview.	Group interview 40-60 min, 10 sessions, twice a week for 5 weeks.	Active control: Only group interview (40-60 min) twice a week over a period of 5 weeks

The provided AT varies considerably: mandala creation in which the trauma is represented (Henderson et al., 2007) or colouring a pre-designed mandala, free clay work, free form painting, collage making, still life drawing (Sandmire et al., 2012), and house-tree-person drawings (HTP) (Yu et al., 2016). Session duration differs from 20 minutes to 75 minutes. The therapy period ranges from only once to eight weeks, with one to ten sessions in total (Table II). In one study, the control group receives the co-intervention only: group interview in Yu et al. (2016). Henderson et al. (2007) use three specific drawing assignments as control condition,

which are not focussed on trauma, opposed to the provided art therapy in the experimental group. Sandmire et al. (2012) used inactive treatment. Here, AT is compared to comfortably sitting. Study settings were outpatient: universities (US) and prison (China). None of the RCTs reported on sources of funding for the studies.

See S3 Table for an extensive overview of characteristics and outcomes of the included studies.

Risk of bias within studies

Based on the Cochrane Collaboration's tool for assessing risk of bias, estimations of bias were made. Table III shows that the risk of bias (RoB) is high in all studies.

Table III. Summary of risk of bias (high, low, unclear)

Study	Selection bias	Performance bias	Detection bias	Attrition bias	Reporting bias	Overall risk of bias
Henderson et al. (2007)	Unclear	High	Unclear	Unclear	Low	**High**
Sandmire et al. (2012)	Unclear	High	Unclear	Low	Low	**High**
Yu et al. (2016)	Unclear	High	Low	Low	Low	**High**

Selection bias (risk on incomparable groups, due to sequence generation and allocation concealment): overall, methods of randomization were not always described, and selection bias can therefore not be ruled out, which leads to unclear RoB. Henderson et al. (2007) described the randomisation of participants over experimental and control groups. However, it is unclear how gender and type of trauma are distributed. Sandmire et al. (2012) did not describe the randomization method but there was no baseline imbalance. Also Yu et al. (2016) did not decribe the randomisation method, but two comparable groups were formed as concluded on baseline measures. Nevertheless it is unclear whether psychopathology of control and experimental groups are comparable.

Performance bias (blinding participants and therapists): Sandmire's RCT had inactive control, which gives a high risk on performance bias (Munder et al., 2017). Like in psychotherapy

outcome research, blinding of patients and therapists is not feasible in AT (Munder et al., 2017; Grant, Pedersen, Osilla, Kulesza & D'Amico, 2016). It is not possible to judge whether the lack of blinding influenced the outcomes and also none of the studies assessed treatment expectancies or credibility prior to or early in treatment, so all studies were scored as 'high risk' on performance bias.

Detection bias (blinding outcome assessors): in all studies only self-report questionnaires were used. The questionnaires used are all validated, which allows a low risk score of response bias. However, the exact circumstances under which measures are used are not described (Henderson et al., 2007; Samdmire et al., 2012) and may have given rise to bias. Presence of the therapist and or fear for lack of anonymity may have influenced scores and may have led to confirmation bias (e.g. (Holmqvist & Persson, 2011), which results in a 'unclear' risk of detection bias.

Attrition bias (incomplete outcome data): in the study of Henderson it is not clear whether the outcome dataset is complete.

Reporting bias (selective reporting): there are no reasons to expect that there has been selective reporting in the studies.

Other issues: in Sandmire et al. (2012) it was noted that the study population constists of liberal arts students, who are likely to have positive feelings towards art making and might expericence more positive effects (reduction of anxiety) than students from other disciplines.

Overall risk of bias: since all studies had one or more domains with high RoB, the overall RoB was high.

Outcomes of individual studies

The measures used in the studies are shown in Table IV. The outcome measures for anxiety differ and include the State-Trait Anxiety Inventory (STAI) (used in two studies), the Hamilton Anxiety Rating Scale (HAM-A) and the Zung Self-rating Anxiety Scale (SAS) (used in one study). Quality of life was not measured in any of the included studies.

Anxiety – in study with inactive control

Sandmire et al. (2012) showed significant between-group effects of art making on state anxiety (tested with ANOVA: experimental group (mean (SD)): 39.3 (9.4) - 29.5 (8.6); control group (mean (SD)): 36.2 (8.8) - 36.0 (10.9); p=0.001) and on trait anxiety (experimental group

(mean (SD)): 39.1 (5.8) - 33.3 (6.1); control group (mean (SD)): 38.2 (10.2) - 37.3 (11.2); *p*=0.004) There were no significant differences in effectiveness between the five types of art making activities.

Anxiety – in studies with active control

Henderson et al. (2007) reported no significant effect of creating mandalas (trauma-related art making) versus random art making on anxiety symptoms (tested with ANCOVA: experimental group (mean (SD)): 45.05 (10.75) - 41.16 (11.30); control group (mean (SD): 49.05 (12.29) - 44.05 (10.12), *p*-value: not reported) immediately after treatment. At follow-up after one month there was also no significant effect of creating mandalas on anxiety symptoms: experimental group (mean (SD): 40.95 (11.54); control group (mean (SD): 42.0 (13.26)), but there was significant improvement of PTSD symptom severity at one-month follow-up (*p*=0.015).

Yu et al. (2016) did not report analyses of between-group effects. Only the experimental group, who made HTP drawings followed by group interview, showed a significant pre- versus post-treatment reduction of anxiety symptoms (two-tailed paired sample t-tests: HAM-A (mean (SD): 24.36 (9.11) - 17.42 (10.42), p=0.001; SAS (mean (SD): 62.63 (9.46) - 56.78 (11.64,) *p*=0.004). The anxiety level in the control group on the other hand, who received only group interview, increased between pre- and post-treatment (HAM-A (mean (SD): 24.75 (6.14) - 25.22 (7.37), not significant; SAS (mean (SD): 62.57 (7.36) - 66.11 (10.41), *p*=0.33).

Table IV. Outcomes and summary of findings from the included studies

Study author & year	Outcome measures	Time points	Intervention(s) and comparator	Significance of outcomes *between groups*	Significance of outcomes *within groups*
Henderson et al. (2007)	Anxiety: STAI	Pre- and post-treatment and follow-up (1 month later)	Experimental group (trauma-related mandala design; n=19) *vs* control group (object drawing; n=17)	Anxiety: NS	Exp. group: Anxiety: NS Control group: Anxiety (STAI): NS
Sandmire et al. (2012)	Anxiety: STAI	Pre- and post-artmaking (no follow-up)	Experimental group (art-making; n=29) vs control group (sitting; n=28)	Anxiety (state): S** Anxiety (trait):S*	Exp. group: Anxiety (state): S** Anxiety (trait) S** Control group (inactive): Anxiety (state): NS Anxiety (trait): NS
Yu et al. (2016)	Anxiety: HAM-A SAS	Pre- and post-treatment (no follow-up)	Experimental group (HTP followed by group interview; n=33) *vs* control group (only group interview; n=36)	NR	Exp. group: HAM-A:S*** SAS:S** Control group: HAM-A: NS SAS:S* (higher anxiety score)

NR = Not reported

NS = Not significant

*S = Significant, * = p<0.05; ** = p<0.01; *** = p<0.001*

Legend: STAI: Spielberger's State-Trait Anxiety Inventory (self-report); HAM-A: Hamilton Anxiety Scale; SAS: Zung Self-Rating Anxiety Scale.

Summary of outcomes and quality

Of three included RCTs studying the effects of AT on reducing anxiety symptoms, one RCT (Sandmire et al., 2012) showed a significant anxiety reduction, one RCT (Yu et al., 2016) was inconclusive because no between-group outcomes were provided, and one RCT (Henderson et al., 2007) found no significant anxiety reduction, but did find signifcant reduction of PTSD symptoms at follow-up.

Regarding within-group differences, two studies (Sandmire et al., 2012; Yu et al., 2016) showed significant pre-posttreatment reduction of anxiety levels in the AT groups and one did not (Henderson et al., 2007).

The quality of the evidence in Sandmire (2012) as assessed with the GRADE classification is low to very low (due to limited information the exact classification could not be determined). The crucial risk of bias, which is likely to serious alter the results (Ryan, 2016), combined the with small sample size (imprecision [Guyatt et al., 2011]) led to downgrading of at least two levels.

Meta-analysis

Because data were insufficiently comparable between the included studies due to variation in study populations, control treatments, the type of AT employed and the use of different measures, a meta-analysis was not performed.

Narrative synthesis

Benefiting populations

AT seems to be effective in the treatment of pre-exam anxiety (for final exams) in adult liberal art students (Sandmire et al., 2012), although the quality of evidence is low due to high RoB. Based on pre-posttreatment anxiety reduction (within-group analysis) AT may be effective for adult prisoners with pre-release anxiety (Yu et al., 2016).

Characteristics of AT for anxiety

Sandmire et al. (2012) gave students with pre-exam stress one choice out of five art-making activities: mandala design, free painting, collage making, free clay work or still life drawing. The activity was limited to one session of 30 minutes. This was done in a setting simulating an art center where students could use art materials to relieve stress. The mandala design activity consisted of a pre-designed mandala which could be completed by using pencils, tempera paints, watercolors, crayons or markers. The free form painting activity was carried out on a sheet of white paper using tempera or water color paints which were used to create an image from imagination. Participants could also use fine-tip permanent makers, crayons, colored

pencils and pastels to add detailed design work upon completion of the initial painting. Collage making was also one of the five options. This was done with precut images and text, by further cutting out the images and additonal images from provided magazins and gluing them on a white piece of paper. Participants could also choose for a clay activity to make a 'pleasing form'. Examples were a pinch pot, coil pot and small animal figures. The final option for art-making was a still life drawing, by arranging objects into a pleasing assembly and drafting with pencil. Additionally, diluted sepia ink could be used to paint in tonal values.

Yu et al. (2016) used the HTP drawings in combination with group interviews about the drawings, to treat pre-release anxiety in male prisoners. The procedure consists of drawing a house, a tree and a person as well as some other objects on a sheet of paper. Yu follows the following interpretation: the house is regarded as the projection of family, the tree represents the environment and the person represents self-identification (Yan & Chen, 2011). The HTP drawing is usually used as a diagnostic tool but is used in this study as an intervention to enable prisoners to become more aware of their emotional issues and cognitions in relation to their upcoming release. A counsellor gives helpful guidance based on the drawing and reflects on informal or missing content, so that the drawings can be enriched and completed. After completion of the drawings, prisoners participated in a group interview in which the unique attributes of the drawings are related to their personal situation and upcoming release.

Henderson et al. (2007) treated traumatised students with mandala creation, aiming for the expression and representation of feelings. The participants were asked to draw a large circle and to fill the circle with feelings or emotions related to their personal trauma. They could use symbols, patterns, designs and colors, but no words. One session lasted 20 minutes and the total intervention consisted of three sessions, on three consecutive days. One month after the intervention, the participants were asked about the symbolic meaning of the mandala drawings.

Working mechanisms of AT

Sandmire used a single administration of art making to treat the handling of stressful situations (final exams) of undergraduate liberal art students. The art intervention did not explicitly expose students to the source of stress, hence a general working mechanism of AT is expected. The authors claim that art making offers a bottom-up approach to reduce anxiety.

Art making, in a non-verbal, tactile and visual manner, helps entering a flow-like-state of mind that can reduce anxiety (Sarid & Huss, 2010), comparable to mindfulness.

Yu reports that nonverbal symbolic methods, like HTP-drawing, are thought to reflect subconscious self-relevant information. The process of art making and reflection upon the art may lead to insights in emotions and (wrong) cognitions that can be addressed during counselling. The authors state that "HTP-drawing is a natural, easy mental intervention technique through which counsellors can guide prisoners to form helpful cognitions and behaviours within a relative relaxing and well-protected psychological environment". In this case the artwork is seen as a form of unconscious self-expression that opens up possibilities for verbal reflections and counselling. In the process of drawing, the counsellor gives guidance so the drawing becomes more complete and enriched, what possibly entails a positive change in the prisoners' cognitive patters and behaviour.

Henderson treated PTSD symptoms in students and expected the therapy to work on anxiety symptoms as well. The AT intervention focussed on the creative expression of traumatic memories, which can been seen as an indirect approach to exposure, with active engagement. The authors indicate that mandala creation (related to trauma) leads to changes in cognition, facilitating increasing gains. Exposure, recall and emotional distancing may be important attributes to recovery.

Summarizing, three different types of AT can be distinguised: 1) using art-making as a pleasant and relaxing activity; 2) using art-making for expression of (unconsious) cognitive patterns, as an insightful tool; and 3) using the art-making process as a consious expression of difficult emotions and (traumatic) memories.

Based on these findings, we can hypothesize that AT may contribute to reducing anxiety symptom severity, because AT may:

- induce relaxation, by stimulating a flow-like state of mind, presumably leading to a reduction of cortisol levels and hence stress and anxiety reduction (stress regulation) (Sandmire et al., 2012);
- make the unconscious visible and thereby creating possibilities to investigate emotions and cognitions, contributing to cognitive regulation (Henderson et al., 2007; Yu et al., 2016);

- create a safe environment for the conscious expression of (difficult) emotions and memories, what is similar to exposure, recall and emotional distancing, possibly leading to better emotion regulation (Henderson et al., 2007).

Discussion

Currently there is no overview of evidence of effectiveness of AT on the reduction of anxiety symptoms and no overview of the intervention characteristics, the populations that might benefit from this treatment and the described and/ or hypothesized working mechanisms. Therefore, a systematic review was performed on RCTs and nRCTs, focusing on the effectiveness of AT in the treatment of anxiety in adults.

Summary of evidence and limitations at study level

Three publications out of 776 hits of the search met all inclusion and exclusion criteria. No supplemented publications from the reference lists (999 titles) of 15 systematic reviews on AT could be included. Considering the small amount of studies, we can conclude that effectiveness research on AT for anxiety in adults is in a beginning state and is developing.
The included studies have a high risk of bias, small to moderate sample sizes and in total a very small number of patients (n=162). As a result, there is no moderate or high-quality evidence of the effectiveness of AT on reducing anxiety symptom severity. Low to very low-quality of evidence is shown for AT for pre-exam anxiety in undergraduate students (Sandmire et al., 2012). One RCT on prelease anxiety in prisoners (Yu et al., 2016) was inconclusive because no between-group outcome analyses were provided, and one RCT on PTSD and anxiety symptoms in students (Henderson et al., 2007) found significant reduction of PTSD symtoms at follow-up, but no significant anxiety reduction. Regarding within-group differences, two studies (Sandmire et al., 2012; Yu et al., 2016) showed significant pre-posttreatment reduction of anxiety levels in the AT groups and one did not (Henderson et al., 2007). Intervention characteristics, populations that might benefit from this treatment and working mechanisms were described. In conclusion, these findings lead us to expect that art

therapy may be effective in the treatment of anxiety in adults as it may improve stress regulation, cognitive regulation and emotion regulation.

Strengths and limitations of this review

The strength of this review is firstly that it is the first systematic review on AT for primary anxiety symptoms. Secondly, its quality, because the Cochrane systematic review methodology was followed, the study protocol was registered before start of the review at PROSPERO, the AMSTAR 2 checklist was used to assess and improve the quality of the review and the results were reported according to the PRISMA guidelines. A third strength is that the search strategy covers a long period of 20 years and a large number of databases (13) and two journals.

A first limitation, according to assessment with the AMSTAR 2 checklist, is that only peer reviewed publications were included, which entails that many but not all data sources were included in the searches. Not included were searches in trial/study registries and in grey literature, since peer reviewed publication was an inclusion criterion. Content experts in the field were also not consulted. Secondly, only three RCTs met the inclusion criteria, each with a different target population: students with moderate PTSD, students with pre-exam anxiety and prisoners with pre-release anxiety. This means that only a small part of the populations of adults with anxiety (disorders) could be studied in this review. A third (possible) limitation concerns the restrictions regarding the included languages and search period applied (1997-October 2017). With respect to the latter it can be said that all included studies are published after 2006, making it likely that the restriction in search period has not influenced the outcome of this review. No studies from 1997 to 2007 met the inclusion and exclusion criteria. This might indicate that (n)RCTs in the field of AT, aimed at anxiety, are relatively new. A fourth limitation is the definition of AT that was used. There are many definitions for AT and discussions about the nature of AT (e.g. Cascone, 2015)). We considered an intervention to be *art therapy* in case the visual arts were used to promote health/wellbeing and/or the author called it art therapy. Thus, only art making as an artistic activity was excluded. This may have led to unwanted exclusion of interesting papers.

A fifth limitation is the use of the GRADE approach to assess the quality of evidence of art therapy studies. This tool is developed for judging quality of evidence of studies on pharmacological treatments, in which blinding is feasible and larger sample sizes are

accustomed. However the assessed study was a RCT on art therapy (Sandmire et al., 2012), in which blinding of patients and therapists was not possible. Because the GRADE approach is not fully tailored for these type of studies, it was difficult to decide whether the the exact classification of the available evidence was low or very low.

Comparison to the AT literature

The results of the review are in agreement with other findings in the scientific literature on AT demonstrating on the one hand promising results of AT and on the other hand showing many methodological weaknesses of AT trials. For example, other systematic reviews on AT also report on promising results for art therapy for PTSD (Nanda et al., 2010; Schouten et al., 2014; Ramirez et al., 2016; Williams et al., 2010; Van Lith, 2016) and for a broader range of (mental) health conditions (Uttley et al., 2015; Slayton et al., 2010; Van Lith, 2016; Lankston et al., 2010; Fenner et al., 2017), but since these reviews also included lower quality study designs next to RCTs and nRCTs, the quality of this evidence is likely to be low to very low as well. These reviews also conclude on methodological shortcomings of art therapy effectiveness studies.

Three approaches in AT were identified in this review: 1) using art-making as a relaxing activity, leading to stress reduction; 2) using the art-making process as a consious pathway to difficult emotions and (traumatic) memories; leading to better emotion regulation; and 3) using art-making for expression, to gain insight in (unconscious) cognitive patterns; leading to better cognitive regulation.

These three approaches can be linked to two major directions in art therapy, identified by Holmqvist & Persson (2011): “art-as-therapy” and “art-in-psychotherapy”. *Art-as-therapy* focuses on the healing ability and relaxing qualities of the art process itself and was first described by Kramer (1975). This can be linked to the findings in the study of Sandmire (2012), where it is suggested that art making led to lower stress levels. Art making is already associated with lower cortisol levels (Kaimal, Ray & Muniz, 2016). A possible explanation for this finding can be that a trance-like state (in flow) occurs during art-making (Csikszentimihalyi, 1997) due to the tactile and visual experience as well as the repetitive muscular activity inherent to art making.

Art-in-psychotherapy, first described by Naumberg (1966) encompasses both the unconscious and the conscious (or semi-conscious) expression of inner feelings and experiences in apparently free and explicit exercises respectively. The art work helps a patient to open up

towards their therapist (Holmqvist & Persson, 2011), so what the patient experienced during the process of creating the art work, can be deepened in conversation. In practice, these approaches often overlap and interweave with one another (McNeilly, Case, Killick, Schaverien & Gilroy, 2011), which is probably why it is combined in one direction 'art-in-psychotherapy'. It might be beneficial to consider these ways of conscious and unconscious expression separately, because it is a fundamental different view on the importance of art making.

The overall picture of the described and hypothesized working mechanisms that emerged in this review lead to the hypotheses that anxiety symptoms may decrease because AT may support stress regulation (by inducing relaxation, presumably comparable to mindfulness (Egger et al., 2015; Brown & Ryan, 2003), emotion regulation (by creating the safe condition for expression and examination of emotions) and cognitive regulation (as art work opens up possibilities to investigate (unconscious) cognitions). These types of regulation all contribute to better self-regulation (e.g. Huijbregts, 2015). The hypothesis with respect to stress regulation is further supported by results from other studies. The process of creating art can promote a state of mindfulness (Eaton & Tieber, 2017). Mindfulness can increase self-regulation (Brown et al., 2003) which is a moderator between coping strength and mental symptomatology (Baumeister, Gailliot, DeWall & Oaten, 2006). Improving patient's self-regulation leads, amongst others, to improvement of coping with disease conditions like anxiety (Huijbregts, 2015; Baumeister et al., 2006). Our findings are in accordance with the findings of Haeyen (2015), stating that patients learn to express emotions more effectively, because AT enables them to "examine feelings without words, pre-verbally and sometimes less consciously", (p.2). The connection between art therapy and emotion regulation is also supported by the recently published narrative review of Gruber & Oepen (2018), who found significant effective short-term mood repair through art making, based on two emotion regulation strategies: venting of negative feelings and distraction strategy: attentional deployment that focuses on positive or neutral emotions to distract from negative emotions.

Future perspectives

Even though this review cannot conclude effectiveness of AT for anxiety in adults, that does not mean that AT does not work. Art therapists and other care professionals do experience

the high potential of AT in clinical practice. It is challenging to find ways to objectify these practical experiences.

The results of the systematic review demonstrate that high quality trials studying effectiveness and working mechanisms of AT for anxiety disorders in general and specifically, and for people with anxiety in specific situations are still lacking. To get high quality evidence of effectiveness of AT on anxiety (disorders), more robust studies are needed.

Besides anxiety symptoms, the effectiveness of AT on aspects of self-regulation like emotion regulation, cognitive regulation and stress regulation should be further studied as well. By evaluating the changes that may occur in the different areas of self-regulation, better hypotheses can be generated with respect to the working mechanisms of AT in the treatment of anxiety.

A key point for AT researchers in developing, executing and reporting on RCTs, is the issue of risk of bias. It is recommended to address more specifically how RoB was minimalized in the design and execution of the study. This can lower the RoB and therefor enhance the quality of the evidence, as judged by reviewers. One of the scientific challenges here is how to assess performance bias in AT reviews. Since blinding of therapists and patients in AT is impossible, and if performance bias is only considered by 'lack of blinding of patients and personnel', every trial on art therapy will have a high risk on performance bias, making the overall RoB high. This implies that high or even medium quality of evidence can never be reached for this intervention, even when all other aspects of the study are of high quality. Behavioural interventions, like psychotherapy and other complex interventions, face the same challenge. In 2017, Munder & Barth (2017) published considerations on how to use the Cochrane's risk of bias tool in psychotherapy outcome research. We fully support the recommendations of Grant and colleagues (2016) and would like to emphasize that tools for assessing risk of bias and quality of evidence need to be tailored to art therapy and (other) complex interventions where blinding is not possible.

Conclusions

The effectiveness of AT on reducing anxiety symptoms severity has hardly been studied in RCTs and nRCTs. There is low-quality to very low-quality evidence of effectiveness of AT for

pre-exam anxiety in undergraduate students. AT may also be effective in reducing pre-release anxiety in prisoners.

The included RCTs demonstrate a wide variety in AT characteristics (AT types, numbers and duration of sessions). The described or hypothesized working mechanisms of art making are: induction of relaxation; working on emotion regulation by creating the safe condition for conscious expression and exploration of difficult emotions, memories and trauma; and working on cognitive regulation by using the art process to open up possibilities to investigate and (positively) change (unconscious) cognitions, beliefs and thoughts.

High quality trials studying effectiveness on anxiety and mediating working mechanisms of AT are currently lacking for all anxiety disorders and for people with anxiety in specific situations.

Supplementary material

S1 Checklist. PRISMA checklist. https://doi.org/10.1371/journal.pone.0208716.s001

S1 File. Full list of search terms and databases. https://doi.org/10.1371/journal.pone.0208716.s002

S1 Table. Data extraction form. https://doi.org/10.1371/journal.pone.0208716.s003

S2 Table. Excluded studies with reasons for exclusion. https://doi.org/10.1371/journal.pone.0208716.s004

S3 Table. Background characteristics of the included studies.
https://doi.org/10.1371/journal.pone.0208716.s005

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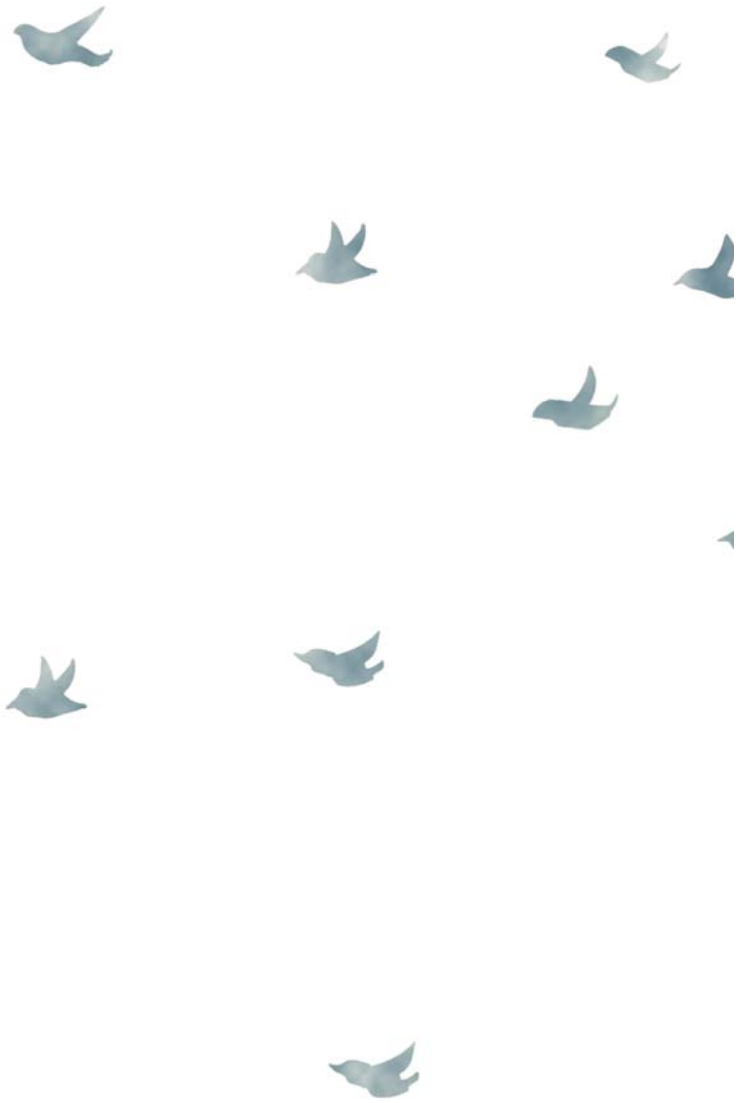
“I was always very hostile about my anxiety. The therapy made me realize: this fear is a part of me at this moment. How can I be hostile to it? I have to care for it.“
(Female particpant of the RCT, 28 years old)



Chapter 3

The effectiveness of art therapy for anxiety in women: a randomized controlled trial

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Abstract

***Objectives*:** Art therapy (AT) as a treatment option for anxiety is regularly employed in clinical practice, but scientific evidence for its effectiveness is lacking, since this intervention has hardly been studied. The aim was to study the effectiveness of AT on anxiety in adult women. The specific type of AT studied was anthroposophic AT.

Methods: a RCT comparing AT versus a waiting list (WL) condition on anxiety symptom severity, quality of life and emotion regulation. Factors influencing treatment outcome were additionally explored. Participants were women, aged 18-65 years, diagnosed with generalized anxiety disorder, social anxiety disorder or panic disorder, with moderate to severe anxiety symptoms. The trial was registered in the Dutch Trial Registration (NTR28143).

***Results*:** Fifty-nine women were included, of which 47 completed the trial. Both per-protocol and intention-to treat analyses demonstrated effectiveness of AT compared to WL, showing a reduction in anxiety, an increase in subjective quality of life (both with large effects) and an improvement in accessibility of emotion regulation strategies (medium effect). Treatment effects remained after 3 months follow-up. Improved acceptance of emotions and improved goal-oriented action are aspects of emotion regulation that are associated with the decrease in anxiety level.

***Conclusions*:** AT is effective in reducing anxiety symptoms, improving quality of life and aspects of emotion regulation. Future RCTs should use active controls (treatment as usual) and study cost-effectiveness.

Introduction

Anxiety

Nearly 29% of the population will be affected by an anxiety disorder somewhere in life (Kessler et al., 2005). It is estimated that currently 264 million people live with anxiety disorders (AD), and this number increased between 2005 and 2015 with 14,9% (World Health Organization, 2017). The presence of an AD is associated with a lower quality of life and a negative impact on psychosocial functioning (Mendlowicz and Stein, 2000; Cramer et al., 2005). The most common ADs that have an impact on daily life are social anxiety disorder (SAD), generalized anxiety disorder (GAD) and panic disorder (PD) (ADAA, 2018). Cognitive behavioural therapy (CBT) and pharmacological therapy (PT) proved to be effective methods for reducing anxiety symptoms (e.g. Kjernisted and Bleau, 2004; Pohl et al., 2005; ; Hooke and Page, 2006; Hofmann and Smits, 2008). However, ADs have a recurrence rate of 54,8% within 4 years, diagnostically instable recurrences included (Scholten et al., 2016) and a substantial portion of individuals does not benefit from these standard treatments. Not only does PT cause side effects, but also between 20 and 50% of patients have either a contra-indication or don't respond to PT (Blanco et al., 2010; Davidson et al., 2004, Hyman, 2010; Lydiard, Brawman-Mintzer & Ballenger, 1996). Combination of PT with CBT is recommended (Bandelow et al., 2012) but around 50% of individuals with ADs do not benefit from CBT (Nielsen et al., 2018), or prefer not to take medication, or prefer non-verbal therapy (Uttely et al., 2015). These groups of individuals may benefit from art therapy.

Art therapy

Art therapy (AT) is a non-verbal, experience-oriented therapy that uses the visual arts (e.g. painting, drawing, sculpting, clay modelling) and is provided as standalone therapy or in multidisciplinary treatment programs for anxiety. The non-verbal AT approach is considered to be suitable for individuals with anxiety, especially if they have difficulty in cognitive (re)labelling of their feelings, or if they are very focused on cognitive labelling and use rationalizing as a psychological coping mechanism (Gold, Vorack & Wigram, 2004; Smeijsters, 2008). Moreover, the non-verbal AT approach is considered to be suitable for patients with high levels of anxiety, since talking about anxiety and traumas can evoke fear and associated

physical reactions (Posthuma, 2001). It is stated that distance to the anxiety can be provided when creating visual artwork. To 'distance' oneself from the emotion during the act of creating art is believed to improve cognitive regulation of emotions (Smeijsters, 2008). The supposed mechanism is that, during the process of creating an artwork, one can experience a feeling of being 'in control', which helps to counterbalance the overwhelming experience of anxiety (van Gerven 1996).

The effectiveness of AT on reducing anxiety symptoms in adults has hardly been studied in randomized controlled trials (RCTs). There are some indications for effectiveness in different populations, but most of these studies have considerable methodological flaws leading to high risk of bias and are therefore of low quality (Abbing, Ponstein, De Sonneville, Swaab & Baars, 2018). There is some evidence for effectiveness of AT for treating pre-exam anxiety in undergraduate students (Sandmire, Gorham, Rankin & Grimm, 2012) and pre-release anxiety in male prisoners (Yu, Yu Ming, Yue, Hai Li & Ling, 2016). There are no studies on specific ADs like GAD, SAD or PD (Abbing, et al., 2018).

AT has a variety of subtypes, that are based on various perspectives from psychoanalysis, cognitive-analytic therapies, compassion-focused therapy, attachment-based psychotherapy and client-centred approaches, like mindfulness and mentalization-based treatments (BAAT, 2018). One of the AT variants with a client-centred approach and with similarities to mindfulness-based treatments is anthroposophic art therapy (AAT).

An expressive approach is common in most art therapy interventions (BAAT, 2019), in which the client is guided to express feelings, thoughts and life experiences. This approach is also used in AAT, but is combined with an 'inwardly oriented' approach, where the therapist offers specific artistic exercises that are often structured and aim to provide 'impressions': profound experiences of colour and shape. These are thought to activate and strengthen the self-regulating ability of the client.

An important feature of anxiety is the exaggerated cognitive appraisal that is associated with the threatening situation: hyper-alert cognitive schemes lead to pathological anxiety (Beck & Haigh, 2014). The rationale behind AAT is that excessive talking about the anxiety is avoided, to enable patients to deviate from 'the thinking-mode' into a 'feeling-mode': the aim is to support the individual to obtain 'profound connection to embodied experiences': to become aware of the anxiety feelings and responses in the body and learn to influence (downregulate) these feelings, by practicing and experiencing. These processes are thought to be supported

through various artistic exercises. The effectiveness of AAT and its working mechanisms is, however, hardly studied and there is currently no adequate theoretical background that provides insight in the specific processes that are influenced by the therapy.

Emotion regulation

Individuals with an AD have more difficulty in regulating emotions compared to individuals without anxiety problems (Mennin, Heimberg, Tuk & Fresco, 2005; Suveg & Zeman, 2004) and are characterized by dysfunctional emotion regulation strategies (Cisler, Olatunji, Feldner & Forsyth, 2010; Ziv, Goldin, Jazaieri, Hahn & Gross, 2013; Jazaieri, Morrison, Goldin & Gross, 2014; Diefenbach, Assaf, Goethe & Guerorguieva, 2016). People with (for example) GAD have developed an increased intensity of emotions, a lack of understanding of emotions, fear for the emotion, and their response to the emotion is inadequate (Mennin, Heimberg, Turk & Fresco, 2002; Mennin, Turk, Heimberg & Carmin, 2004).

Emotion regulation (ER) refers to the intrinsic and extrinsic processes that influence the way in which emotions are expressed or suppressed and are given meaning to, conscious as well as unconscious (Gross & Thompson, 2007). Gratz and Roemer (2004) developed a concept of emotion regulation, which involves the "awareness and understanding of emotions, acceptance of emotions, ability to control impulsive behaviours and behave in accordance with desired goals when experiencing negative emotions, and the ability to use situationally appropriate emotion regulation strategies flexibly" (Gratz & Roemer, 2004, pp.42-43). ER can be improved through training and therapy (Baumeister, Gailliot, DeWall & Oaten, 2006; Tang & Posner, 2009). Artistic exercises, like for example expressive writing, can downregulate emotional distress and promote self-insight (e.g. Pennebaker & Chung, 2007), Thus, ER is an important factor in evaluating AT treatment effects. The connection between AT and ER has already been studied and preliminary established in a narrative review on effectiveness studies (Gruber & Oepen, 2018), primarily focusing on changes in mood in healthy subjects. To gain more insight in the working mechanism(s) of AT on anxiety, it is important to not only investigate the effectiveness of AT on anxiety symptom severity, but also simultaneously explore the role of ER.

Rationale and objectives

Given the need for evidence-based additional treatments for anxiety disorders and the lack of methodologically sound effectiveness studies on AT for these indications (Abbing et al., 2018), we designed and executed a study on the effectiveness of art therapy in reducing anxiety in adult women.

The *primary objective* was to assess the effectiveness of art therapy on anxiety and quality of life (QoL) in women with anxiety disorders.

The *secondary objective* was to explore factors influencing treatment outcome.

Materials and methods

The CONSORT-NPT statement was used for reporting this trial, which is the extension of the CONSORT for randomized trials assessing nonpharmacologic treatments (NPTs) (Boutron, Altman, Moher, Schulz & Ravaud, 2017).

Trial design

The effectiveness of AT on anxiety symptoms in adult women was studied within a randomized controlled trial design (RCT). The trial was pragmatic in the sense that it aimed to study the effectiveness of the intervention as it is normally practiced in the field. Participants were pre-stratified on comorbid depression and on psychopharmaceuticals use (see section "Randomization Method and Allocation Concealment") and subsequently randomly assigned to an experimental group receiving anthroposopohic AT (AT1 group) or a control group with participants on a waiting list (WL group), continuing their current treatment, if any, for three months. Both groups were measured at baseline (pre-test/T0) and after the intervention/ waiting time at three months (post-test/T1). The control group then received the intervention (AT2 group) and was assessed immediately after intervention at three months. The experimental group was also assessed after three months (follow-up/T2) (Figure 2). Ethical approval was obtained from the Medical Ethical Committee of the Leiden University Medical Centre, the Netherlands (NL36861.018.11) and the trial was registered in the Dutch Trial Registration (NL6661).

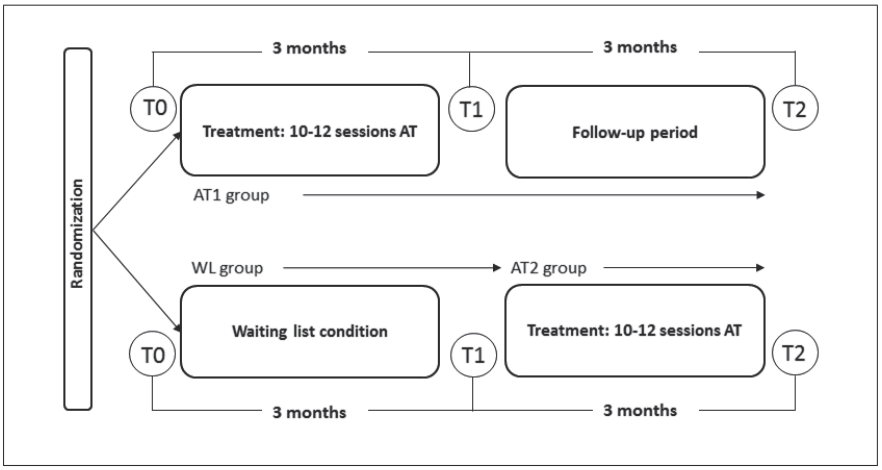


Figure 2. Trial design
AT1 group = art therapy group / experimental group
WL group = waiting list group / control group
AT2 group = second treatment group

Participants

Participants were recruited through posters/flyers in the practices of family doctors and by social media. Information about the trial was provided through a website where patients could register by filling out a screening instrument (the Dutch version of the Four Dimension Symptoms Questionnaire (4DKL)) (Terluin, 1996; Terluin, Van Rhenen., Schaufeli, & De Haan, 2004). Women with moderate to severe anxiety symptoms, scoring >7 for anxiety and/or >10 for distress on the 4DKL (Terluin & Duijsens, 2002), were contacted by phone for eligibility assessment. The inclusion was dimensional in nature: subjects were included primarily based on the level of anxiety symptoms.

Included were adult woman (18-65 years), with GAD, SAD and/or PD (with or without agoraphobia) (diagnosed by means of the MINI-plus diagnostic interview (Sheehan et al, 1998). Candidates were excluded if they had suffered from psychosis or hallucinations, alcohol or drug addiction, suicidal risk and/or brain pathology. Including only women was a post-recruitment decision, since only one male subject fulfilled the inclusion criteria.

Participants signed the informed consent that was approved by the Medical Ethical Committee.

Intervention and procedure

The study took place at 25 private art therapy practices spread throughout the Netherlands, in the period between January 2017 and March 2018.

After randomization AT-participants received 10-12 individual AT sessions of 45-60 minutes per session for three months. Treatment was provided only by qualified and registered Dutch anthroposophic art therapists, with more than five years' experience in working with adults with anxiety. By only including therapists that fulfil the quality criteria stated by the professional organization, it was assured that the intervention deployed in the study was representative for the general approach in AAT.

The treatment was based on common practice and consensus within the Dutch professional association of anthroposophic art therapists (NVKT): first to third session involve intake and free art work, after which treatment goals are set and a therapy plan is made by the therapist, based on intake and observation of client and art work (Huber, van der Elst & Riezebos, 2003). This plan consists of a variety of artistic exercises that could be chosen from a list with treatment goals and art therapy activities, based on consensus within the professional association (Table I). No fixed treatment protocol was used since anthroposophic AT is a highly individualized treatment. Instead, the exercises on the list could be chosen and adapted to the individual patient, each session taking into account the patients' specific context. The overview listed several exercises within three media: drawing, painting and clay work (Table I). The contents of the therapy processes (treatment goals and exercises) were documented by the therapists. Afterwards, researchers checked if the deployed activities fulfilled the list of treatment goals and exercises. The WL participants were on the waiting list for three months and received AT three months later (Figure 2).

Table I. List of artistic exercises and therapy goals, approved by the Dutch AAT association.

Session	Aims	Exercises
Session 1-3	Intake Set treatment goals and plan	Free artwork
Sessions 4-10	Optional treatment goals: *Creating a feeling of safety* *Experiencing boundaries* *Strengthening objectivity* *Reinforcing connection with feeling* *Promoting relaxation* *Reinforcing self-confidence* Other treatment goals are allowed; mention these treatment goals here and describe why these are important in the treatment of your client.	Optional artistic exercises: • Clay: *Clay modelling of a sphere.* *Clay modelling of platonic solids.* *Transformation of (symbolic) shapes.* • Drawing: *Expression of fear in free drawing.* *Atmospheric images in relation to inner feeling, with pastel drawing.* *Shape drawing (loops).* *Drawing from observation.* *Light-dark exercises with charcoal.* *Colour exercises with pastel.* • Painting: *Expression of fear in free painting.* *Colour exercises in wet-on-wet technique (aquarelle paint on wet paper).* Other exercises are allowed; provide rationale for these exercises and a description.
Session 12	Evaluation	

Measures

The following measures were used for screening, diagnosing and determining anxiety symptom severity, QoL and ER.

Screening for psychological problems

Participants were screened by the 4DKL (Terluin, 1996). This is a questionnaire for adolescents and adults and screens on psychological problems with 50 items, measuring symptoms of distress, depression, anxiety and somatic symptoms. Anxiety symptoms are measured by 12 items. This instrument is reliable and valid (Egberink, Holly-Middelkamp & Vermeulen, 2005).

Diagnostic interview for anxiety disorders and comorbidity

Psychopathology was assessed using the Dutch version of the rater-administered Mini International Neuropsychiatric Interview Plus (MINI-Plus) (Van Vliet, Leroy & van Meegen, 2000), which is a comprehensive diagnostic semi-structured interview. In the present study,

the MINI-Plus was used to assess the type(s) of anxiety disorder and the presence of (comorbid) depression, PTSS and substance abuse (exclusion criterium).

Primary outcome: level and dimensions of anxiety

The Dutch version of the Lehrer Woolfolk Anxiety Symptom Questionnaire (LWASQ) (Lehrer & Woolfolk, 1983) was used to measure the anxiety level. The LWASQ is a self-report, generic anxiety instrument with 36 questions which assesses the cognitive (worry and rumination), behavioural (avoidance) and somatic (physical symptoms) aspects of anxiety. The reliability of the LWASQ is sufficient (α = .83 tot .92) and the questionnaire is suitable for the measurement of treatment effects (Scholing & Emmelkamp, 1992).

Secondary outcomes: subjective quality of life and emotion regulation

The Dutch version of the MANchester Short Assessment of QoL (MANSA) (Priebe, Huxley, Knight & Evans, 1999; Van Nieuwenhuizen, Schene & Koeter, 2000)) was used to measure QoL. This instrument consists of 12 questions that measure the satisfaction with e.g. life in general, work and friendships. The MANSA is a reliable instrument (Jansen-de Ruiter & Van Nieuwenhuizen, 2015).

To measure the difficulties that patients experience in ER, the Dutch version of the Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004) was used. The questionnaire consists of 36 items in six domains: 1) lack of clarity of emotions, 2) lack of awareness of emotions, 3) difficulty in controlling impulses, 4) non-acceptance of emotions, 5) limited access to ER strategies and 6) difficulty with goal-oriented action (Gratz & Roemer, 2004).

The DERS can be reliably deployed and interpreted in different demographic groups (Ritschel, Tone, Schoemann, & Lim, 2015). The construct validity and internal consistency (Cronbach's α> .80) is sufficient for all scales (Gratz& Roemer, 2004; Neumann et al., 2010). The test-retest reliability for the total score is good (r = .88; subscales .56 <r <.90).

Procedure of measurements

All participants completed online assessments of the 4DKL, LWASQ, MANSA, and DERS at three time points (Table II).

Table II. Procedure

	PHASE I		PHASE II
	T0	T1 (+3 months)	T2 (+3 months)
AT1	Pre-treatment	Post-treatment	Follow-up
WL	Pre-wait time	Post wait time / Pre-treatment AT2	Post-treatment AT2

All questionnaires were administered with Qualtrics Survey Software (Qualtrics (2005), Provo, UT, version 2017).

Sample size

Sample size calculation was based on a pre-post measurement difference in the primary outcome of 15% (as this was considered a clinically relevant decrease in LWASQ total score), with an alpha of 0.05 and a power of 0.80. Considering a dropout rate of 15%, the estimated sample size was 30 patients per group; a total of 60 participants (http://clincalc.com/stats/samplesize.aspx).

Randomization method and allocation concealment

Participants were pre-stratified into four strata: whether or not using psychotropic drugs, and whether or not having moderate or severe depression symptoms (4DKL: depression >6), and subsequently assigned to treatment (AT) or control group (WL) by means of block randomization (blocks of 2) (Figure 2). Participants received a participation number at enrolment. After enrolment and stratification of participants by A.A., a list with the random allocation sequence was generated by E.B. through computer selection (www.randomization.com). A.A. assigned participants to intervention according to the randomisation list.

Art therapists and participants could not be blinded.

Statistical methods

Statistical analyses were conducted using SPSS statistics (version 23.0) (IBM corp, 2015). All data were checked for normal distribution using the Shapiro Wilk test, Q-Q plot and histogram.

Evaluation of baseline differences

The randomization was evaluated by comparing experimental and control group at baseline. For normal distributed, continuous variables an independent t-test was used and the variables were presented as mean ± standard deviation (SD). For categorical variables Pearson's chi-squared test was applied and variables were presented as number and/or percentage.

Missing values

Reasons for missing values were reported. Dropouts were compared to completers using pre-test measures on age, anxiety score, depression score and QoL score, by use of independent students t-tests. If no significant differences were found, the missing cases were deleted and per protocol (PP) analyses were performed for all outcomes.

For the intention-to-treat (ITT) analysis missing values on anxiety score at baseline (T0) and T1 for all participants that were randomized to one of the two groups were imputed based on two theoretical models (White, Horton, Carpenter & Pocock, 2011). In the first model participants with no measurements at T0 and T1 received anxiety scores that were the mean of the condition they were allocated to and at T1 the same score was imputed (last observation carried forward (LOCF) procedure), expressing that there was no treatment effect and participants were comparable to the average participant. Participants with no measurement at T1 received the anxiety score at T0 (LOCF procedure). The second model was the same, with the only difference that the participants with no measurements at T0 and T1 received anxiety scores that were the highest possible score, expressing the worst-case scenario that these participants were the ones with highest anxiety level.

Hypotheses

The following hypotheses were tested: (1) AT is superior to waiting list in reducing anxiety symptoms and improving QoL in adult women with anxiety disorders; (2) the effects of AT remain at three months follow-up; and (3) the effects of AT are confirmed in the waiting list group that receives AT three months later.

Evaluation of treatment effects

To examine hypothesis 1, a general linear model repeated measures analysis for variance (RM-ANOVA) was used, using outcomes of LWASQ at pre- and post-treatment as levels of the

within-subject (WS) factor Test moment (T0 vs. T1) and Group (AT1 vs. WL) as between-subjects (BS) factor. To conclude that the treatment has a positive effect, the Test moment*Group interaction must be significant and in the right direction. To test if reduction of anxiety was different for the three subscales of the LWASQ, these subscales were added as levels of the WS factor Scale in a second analysis. Likewise, for the secondary outcomes (MANSA, DERS), RM-ANOVAs were performed. If trend significant interactions were found, further explorative analyses (paired t-tests) were executed to measure within-group effects.

A PP analysis was performed for all primary and secondary outcome variables. In addition, an ITT analysis was performed for the primary outcome variable 'level of anxiety'.

A p-value of 0.05 was considered statistically significant. The effect size Partial Eta Squared (η_p^2) was calculated to assess the magnitude of the effect. An effect size of 0.01-0.06 is considered a small effect, 0.06-0.14 a medium, and >0.14 a large effect in RM analysis (Borenstein, 2009).

For hypothesis 2, a RM-ANOVA with Test moment (T0, T1, T2) as WS factor on the primary and secondary outcomes of the AT1 group was performed, to determine if treatment effects remain for (at least) three months and to test if an effect (compared to baseline) still exists, using a simple contrast with T0 as the reference level (T0 vs. T1, T0 vs. T2).

Hypothesis 3 was tested with paired t-tests on T1-T2 outcomes (pre- vs. post-treatment) of the WL group that received treatment (AT2).

Exploration of factors influencing anxiety reduction

To explore factors that influence anxiety symptom reduction, correlations were computed between the primary outcome variable (pre-post treatment difference in anxiety symptom severity, PP analysis) and the pre-post treatment difference scores on QoL, distress, somatization and difficulties in ER. Only the significant correlations were further studied with regression analysis within the total treatment group (AT1 and AT2 together), to examine if improvements of ER were associated with anxiety symptom reduction. An ANCOVA with pre- and post-treatment scores of anxiety, and the pre-post treatment difference score of ER as covariate was performed as posthoc analysis.

To explore pre-treatment factors that would favourably affect the success of treatment, the same procedure was followed, but with pre-treatment measures of age, duration of anxiety, comorbidity (number) and level of education. Regression analyses were conducted within the

total treatment group (AT1 and AT2 together), with the primary outcome variable (pre-post treatment difference in anxiety symptom severity, PP analysis) and the pre-treatment measures that showed a significant correlation with the anxiety difference score.

Results

Participant flow

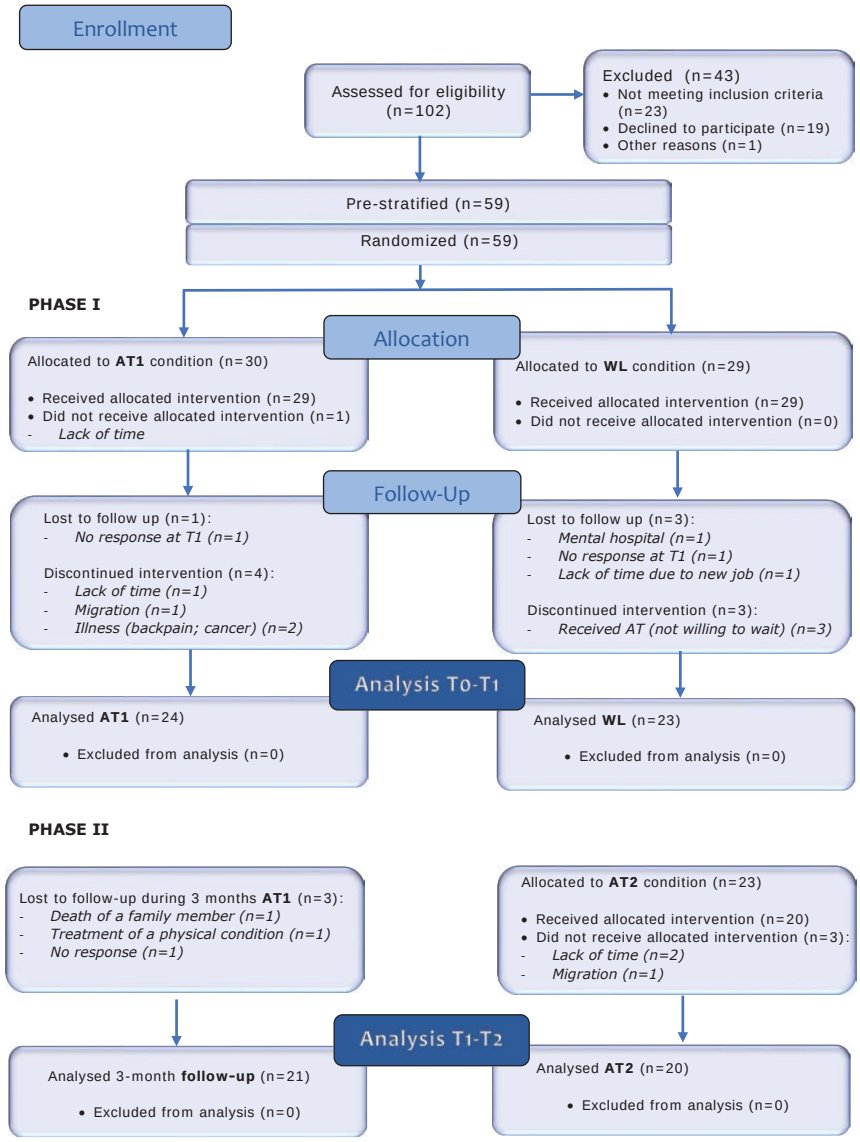
In the period January 2017 until July 2017, 102 persons applied for the trial and were screened for eligibility. A total of 43 patients was excluded for not meeting the inclusion criteria (n=23) or not willing to participate (n=19) or for other reasons (n=1).

In total, 59 participants were included and randomized after stratification. The distribution over the four strata was as follows: no depression and no psychopharmaceuticals (n=27), no depression and psychopharmaceuticals (n=11), depression and no psychopharmaceuticals (n=14), depression and psychopharmaceuticals (n=7).

Thirty participants were assigned to the intervention group (AT1) and 29 to the control group (WL). During the study, 12 participants dropped out, six from the AT1 group and six from the WL group. Loss-to-follow-up occurred in the AT1 group (n=1), as well in the WL group (n=3). In total, data of 47 participants were analysed in the PP analysis: 24 in the AT1 group and 23 in the WL group.

Participants of the AT1 group were followed-up around three months after completion of the treatment. Participants of the WL group received AT (AT2 group) after completion of the three months wait time. Three participants of AT1 group were lost to follow-up and three participants of the AT2 group did not receive the intervention for several reasons (Figure 3).

Figure 3. Study Flow Diagram



Missing values

Twelve participants (20%) dropped out and 47 participants (80%) completed Phase I of the trial. There were no significant differences between dropouts and completers on baseline parameters: age, anxiety score (LWASQ), anxiety score (4DKL), depression score (4DKL), distress score (4DKL), somatization score (4DKL) and QoL (MANSA) (.87<*p*<.29). These results

indicate that missings were completely at random and could be listwise deleted, without risk of bias, and further analyses are per-protocol.

Baseline characteristics

Table III gives an overview of the baseline characteristics of participants. The participants did not differ on key variables, including age, diagnosis, use of medication, occupation, education, familiarity with AM and outcome variables at baseline.

The analysed sample of 47 participants had a mean age of 44.4 years (SD=14.0), moderate to severe anxiety symptoms: 11.2 (SD=4.6), a mean duration of anxiety symptoms of 17.6 years (SD=18.9) (range: three months - 64 years (lifetime)). Medication for anxiety was used by 15 participants and 11 participants received other therapies next to AT (psychotherapy, EMDR and acupuncture).

Multiple anxiety diagnoses applied to all participants, with 2-5 anxiety disorders per person. The criteria for the diagnosis GAD were met 25 times, for SAD 21 and for PD 28 times. Ten participants suffered from (comorbid) PTSD, five participants had current comorbid depression and 16 participants experienced one or more depressive episodes prior to this study.

Table III. Participants' baseline characteristics

Characteristics		AT (n=24) *Mean (SD) or n(%)*	WL (n=23) *Mean (SD) or n(%)*	*p*
Age (years)		42.4 (14)	46.5 (14)	.32
4DKL Anxiety	> 7 moderate; > 12 severe	12.0 (4.3)	10.3 (4.9)	.21
Anxiety score	LWASQ total score	103.2 (21.4)	97.2 (21.7)	.34
Anxiety disorder according to MINI+	GAD	14 (58%)	11 (48%)	.47
	SAD	9 (38%)	12 (52%)	.31
	PD	14 (58%)	14 (61%)	.61
	Comorbid PTSD	4 (17%)	6 (26%)	.40
Duration	Of anxiety symptoms (years)	15.1(±18.6)	20.2(±19.4)	.34
4DKL Distress	> 20 severe	23.0 (6.2)	22.6 (5.0)	.81
4DKL Depression		4,0 (2,7)	4,2 (3.3)	.77
Depression according to MINI+	Current Depression	3 (13%)	2 (9%)	.46
	Previous Depression	7 (29%)	9 (39%)	
Medication		7 (29%)	8 (35%)	.51
Other therapies during study period		6 (25%)	5 (22%)	.41
Occupation	Working	6 (25%)	7 (30%)	.52
	Self employed	3 (13%)	3 (13%)	
	Student	2 (8%)	2 (9%)	
	Unemployed	3 (13%)	2 (9%)	
	Sick leave / incapacitated	9 (38%)	9 (39%)	
Education	Low	3 (13%)	2 (9%)	.14
	Moderate	9 (38%)	4 (17%)	
	High	11 (46%)	17 (74%)	

4DKL: Four-Dimensional Symptom Questionnaire; AT: art therapy group; WL: waiting list group; Education: Low (elementary school, vmbo, mbo1), Moderate (havo, vwo, mbo2-4), High (HBO, WO); Medication: psychotropic medication; p-values <0,05 were considered significant.

Features of the experimental treatment

In total, 44 participants completed the therapy, and 37 case files were received until September 2018 and analysed. All cases fulfilled the criteria of an AAT intervention as described in the study protocol: use of anthroposophic AT exercises from the predefined list and adaptation of the intervention to the specific context of each individual patient (optional). Therapy plans consisted of artistic exercises in which the media drawing and clay modelling were used most often, respectively in 37 and 34 of the analysed 37 cases, and painting in 21 cases. Drawing exercises consisted of shape drawing, charcoal drawing, pastel drawing and visualization exercises. The most deployed techniques were shape drawing (drawing of relaxing loops), often provided as homework exercise, the creation of light-dark contrasts and conversions (charcoal drawing), drawing from observation and working on atmospheric

images in relation to inner feeling (pastel drawing). The expression of the fear, with various materials and techniques, often preceded by a visualization exercise, was also used in most cases. Within the clay medium, round shapes were most frequently used, as well as the modelling of one or more platonic solids. Transformation processes and symbolic exercises were also frequently applied within the clay medium. Painting exercises were mainly the wet-in-wet technique (aquarelle paint on wet paper) and were mainly used in the first sessions as free artwork.

Treatment effects – primary outcomes

Per protocol analysis

On the primary outcome anxiety symptom severity, the interaction effect Test moment*Group was significant: F(1,45)=11.49, p=0.001, with a large effect size (η_p^2= 0.20), showing that anxiety was reduced in the AT1 group but not in the WL group (see Figure 3). The three subscales of the LWASQ, added in a second analysis as levels of the WS factor Scale, showed no significant interaction Test moment*Group*Scale (p=0.71), reflecting that the improvements in anxiety symptom severity hold equally for the somatic, behavioural and the cognitive area.

The within-group outcomes (mean differences, SDs, 95% CIs and p-values) are presented in Table IV.

Intention to treat analysis

Both ITT analyses for the primary outcome (LWASQ) demonstrate the same significant differences between the groups: p=0.011 with a medium effect size (η_p^2= 0.11).

Table IV. Primary and Secondary Within-Group Outcomes
Mean, standard deviation, 95% CIs and p-values from pre- to post-treatment (paired t-tests)

Within-Group Outcomes				
Measure and condition	**T0 Mean (SD)**	**T1 Mean (SD)**	**Mean diff (SD); 95% CI**	***p*-values**
Anxiety score (LWASQ total)				
AT (n=24)	103,21 (21.45)	83,50 (21,36)***	19,71 (24,07); 9,55-29,87	.001
WL (n=23)	97,17 (21,66)	97,04 (23,76)	0,13(13,99); -5,92-6,17	.965
LWASQ soma				
AT (n=24)	40,17 (10,51)	33,38 (10,83)**	6,79 (10,25); 2,46-11,12	.004
WL (n=23)	40,43 (10,61)	40,74 (11,01)	-0,30 (7,49); -3,54-2,94	.847
LWASQ behav				
AT (n=24)	27,04 (8,21)	21,50 (7,85)***	5,54 (7,02); 2,58-8,51	.001
WL (n=23)	22,91 (8,64)	22,87 (8,57)	0.04 (4,46); -1,88-1,97	.963
LWASQ cogn				
AT (n=24)	36,00 (8,10)	28,63 (7,49)***	7,38 (8,62); 3,74-11,01	<.0001
WL (n=23)	33,83 (8,11)	33,43 (9,01)	0.39 (6,34); -2,35-3,14	.770
Anxiety score (4DKL)				
AT (n=24)	12,00 (4,32)	6,46 (3,78)***	5,54 (4,31); 3,72-7,36	< .0001
WL (n=23)	10,30 (4,89)	9,65 (6,07)	0,65 (4,43); -1,26-2,57	.49
Quality of life (MANSA)				
AT (n=24)	53,92 (7,23)	61,29 (6,18)***	-8,00 (5,28); -10,23-5,77	.0001
WL (n=23)	56,26 (8,44)	57,74 (6,84)	-1,48(3,92); -3,18-0,22	.084
Emotion regulation (DERS total)				
AT (n=24)	100,67 (21,66)	87,63 (17,32)**	13,04 (19,46); 4,83-21,28	.003
WL (n=23)	97,57 (18,41)	93,87 (19,45)	3,70 (12,13); -1,11-8,84	.16

** p<0.05 / ** p<0.01 / *** p<0.001*

Treatment effects – secondary outcomes

Quality of life

The interaction Test moment*Group was: F(1,45)=22.94, p<0.0001 and the effect size was large (η_p^2=0.52), reflecting, that QoL was increased in the AT group but not in the WL group (Figure 4).

Emotion regulation

The interaction Test moment*Group was trend significant for difficulties in ER (total score): F(1,45)=3.87, p=0.055, and was accompanied by a medium effect size (η_p^2=0.08). Posthoc

analysis confirmed that total ER improvement was significant in the AT group (p=0.003) but not in the WL group (p=0.16). On the subscale level, the only significant interaction Test moment * Group was on the subscale *limited access to ER strategies*: F(1,45)=6.0, p=0.018, η_p^2=0.12. This indicates that participants had better accessibility to ER strategies after therapy. The subscales *lack of clarity of emotions*, *non-acceptance of emotions* and *limited access to ER strategies* showed significant improvements in the AT group (within-group analysis) (0.008<p<0.05) (Table III).

Follow-up outcomes in first treatment condition

The first treatment group (AT1) was followed up three months after treatment (n=21). Using a simple contrast with T0 as reference level (first contrast: T0 vs. T1, second contrast: T0 vs. T2), the RM-ANOVA on anxiety symptom severity revealed a significant first and second contrast ($F_{T0\ vs.\ T1}$(1,20)=10,68, p=0.004, η_p^2= .35; $F_{T0\ vs.\ T2}$ (1,20)=16.51, p=0.001, η_p^2= .45). Similar effects were observed for QoL ($F_{T0\ vs.\ T1}$(1,20)=41.1, p<0.0001, η_p^2= .67, $F_{T0\ vs.\ T2}$ (1,20)=12.56, p=0.002, η_p^2= .39) and ER ($F_{T0\ vs.\ T1}$(1,20)=9.04, p=0.007, η_p^2=.31, $F_{T0\ vs.\ T2}$ (1,20)=14.43, p=0.001, η_p^2=.42). The observed treatment effects on anxiety symptom severity, QoL and ER remained at follow-up (Figure 3). The outcomes at T2 were still significantly improved compared to baseline (T0).

Outcomes in second treatment condition

The second treatment group (AT2, n=20), showed similar improvements as the first treatment group: anxiety is significantly lowered in the AT2 condition (mean(SD)): 95(24,10)–77,55(21,57), p=0.001, with a large effect size (η_p^2=.45).

However, there are some differences. The improvement in QoL was not significant in the AT2 condition (mean(SD); 58,05(6,93)-60,30(9,13), p=0.11 (η_p^2=.13), while it was highly significant in the AT1 group. The improvement in total ER was significant in de AT2 condition (mean(SD)): 94,45(19,83)-83,95(21,59), p=0.003, (η_p^2=.38), and associated with a larger effect size compared to the AT1 group.

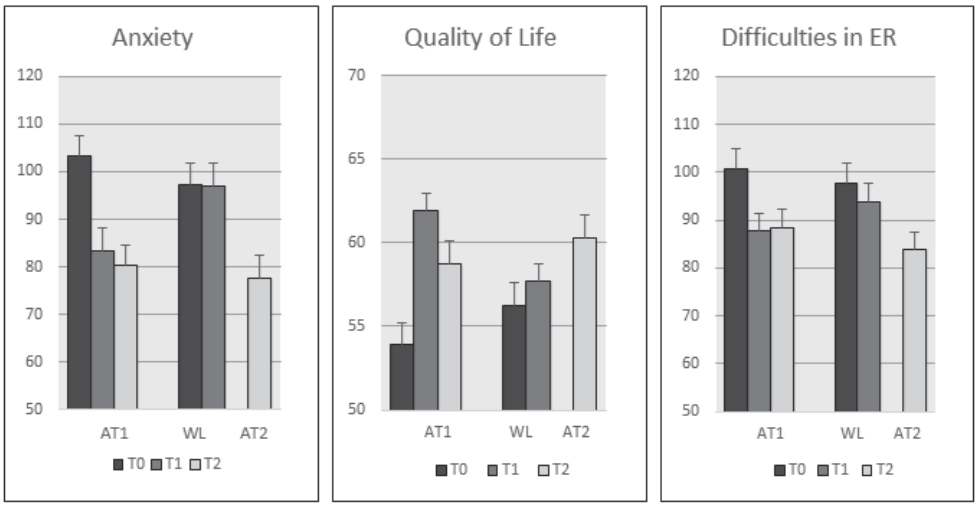


Figure 4. Primary and secondary outcomes at T0, T1 and T2
Means (SE)
AT1 group = art therapy group / experimental group
WL group = waiting list group / control group
AT2 group = second treatment group

Exploration of factors that influence anxiety reduction

The total treatment group (n=44) consisted of AT1 (n=24) and AT2 (n=20). The mean difference in anxiety symptom severity of the total treatment group was 18,68 (SD=21,96) (95%CI: 12,01-25,36, p<.0001), which represents an anxiety severity decrease of 18,6%.

Role of emotion regulation in anxiety reduction

The LWASQ difference score (pre-post treatment) was correlated with the difference scores of the other outcomes (MANSA, DERS). ER difference score was correlated with anxiety symptoms (r=.39, *p*<0.0001), reflecting that a decrease in anxiety symptoms was associated with an increase in ER. Looking at the subscale level, improvement on five of the six ER subscales was associated with a decrease of anxiety symptoms: *clarity of emotions* (r=.30, *p*=0.005), *controlling impulses* (r=.24, *p*=0.024), *acceptance of emotions* (r=.43, *p*<0.0001), *access to ER strategies* (r=.27, *p*=0.013) and *goal-oriented action* (r=.31, *p*=0.004).

An explorative backward regression analysis with these variables resulted in a significant model ($F(2,41) = 17.55$, $p<0.0001$, $R^2=.461$). The model consisted of two subscales of the DERS: improvement in *Non-acceptance of emotions* ($\beta=.556$, t=4,39, $p<0.0001$) and improvement in *Difficulties with goal-oriented actions* ($\beta=.220$, t=1,739, $p=0.09$) explaining 46,1% of the variance in anxiety symptom reduction.

The posthoc ANCOVA on anxiety level showed a significant interaction ($F(1,22)=29,52$, $p<0.0001$, $\eta_p^2=0.57$) between Test moment (pre vs. post treatment) and the covariate reduction of difficulties in emotion regulation, reflecting that larger anxiety reduction was highly associated with larger improvement in ER.

Baseline factors that influence treatment success

The LWASQ difference score (pre-post treatment) was correlated with age, duration of anxiety, number of comorbidities, education, familiarity with AT or anthroposophic healthcare, pre-treatment levels of anxiety (LWASQ), QoL (MANSA), ER (DERS), distress, depression and somatization (4DKL). Only pre-treatment levels of anxiety ($r=.38$, $p<0.0001$) and ER ($r=.25$, $p=0,017$) showed a significant correlation with therapy success (anxiety reduction).

A regression analysis (Method=Enter) resulted in a significant model ($F(2,41)=6.30$, $p=0.004$, $R^2=0.235$) with pre-treatment level of anxiety ($\beta=-.350$; t=-2.33) and pre-treatment ER score ($\beta=-.220$; t=-1.46), together explaining 23,5% of the variance in anxiety symptom reduction.

Discussion

Summary of outcomes

This study is the first RCT that studied an art therapy intervention for GAD, SAD and PD. For this reason and because anthroposophic AT as a complex intervention is adjusted to the needs of individual patients, the RCT had a pragmatic character. To evaluate the intervention as provided in clinical practice, therapists were allowed to deploy the treatment as they would normally do. The tested intervention was executed by trained AAT professionals who are able to individualize the treatment within the boundaries of the described goals, means and

exercises, based on consensus within the professional organization. Artistic exercises with clay, drawing and painting were used in every case to work on anxiety reduction. The most used medium was drawing in particular shape drawing, often as 'warming-up' and also as homework exercises. The second most used medium was clay work): the modelling of a sphere or other round shapes and metamorphosis series of platonic solids were the most frequent deployed exercises.

The outcomes show that 10-12 sessions of AT lead to a significant decrease of anxiety symptoms, as well as a significant improvement in QoL and remained at three months follow-up. Significant improvements were also observed with respect to *access to emotion regulation strategies*. Improvements in emotion regulation were highly associated with anxiety reduction: the ER aspects *acceptance of emotions* and *improved goal-oriented action* accounted for 46% of the improvement in anxiety symptom severity. Participants with higher pre-treatment anxiety scores and those who experienced many difficulties in ER pre-treatment showed the largest improvements.

Interpretation and comparison to literature

Effects of art therapy on anxiety in adults have been suggested in other studies (Sandmire et al., 2012; Moayer Toroghi, 2015; Yu et al., 2016), although these studies have methodological issues resulting in a high risk of bias (Abbing et al, 2018) and do not concern subjects with specific or diagnosed anxiety disorders.

Anxiety symptoms are related to less effective ER (Mennin, Heimber, Tuk & Fresco, 2005; Suveg & Zeman, 2004). The association of improved ER with anxiety reduction in our study is in line with results from various studies which show that a decrease of anxiety is related to improvement of ER (Cisler & Olatnuji, 2012). Our RCT showed that ER is a factor that influences anxiety reduction through art therapy. The improvements in ER that had the largest influence were o better *acceptance of emotions* and improved *goal-oriented action.* Usually, ER training focuses on strategies that minimize negative emotions and/or maximize positive emotions (Koole & Aldao, 2016). These strategies largely fall within need-oriented ER and appear to provide limited contributions to psychological health (Aldao & Nolen-Hoeksema, 2012). Instead, Koole and Aldao (2016) argue that the focus should be more towards goal-oriented ER and person-oriented ER, to learn to apply strategies more flexibly and adaptively. The improvement of *goal-oriented action* in our study suggests that AT promotes goal-oriented

ER. AT may also improve person-oriented ER, since to gain *acceptance of emotions*, it is needed to face the emotion and to endure this. This could be easier and less threatening if the emotion can be faced in externalized form, which is the case in artwork (Haeyen, 2018).
Higher pre-treatment scores of anxiety were predictive of therapy success. This seems plausible, because the higher the score, the more room for improvement. Another possible explanation is that AT is most suitable for patients with severe anxiety symptoms.

Strengths and limitations

The strength of this study is the RCT design, being used to study the effectiveness of AT in reducing anxiety in subjects with anxiety disorders for the first time. Other strengths are the broad inclusion criteria that were used, to assess whether the intervention could be helpful to most women with moderate to high levels of anxiety symptoms (dimensional approach), and not just to a narrow diagnostic subgroup.
The set of relevant outcome variables (anxiety symptom level, QoL and ER) enabled us to explore a possible working mechanism. The strength of the LWASQ is that it is able to measure both cognitive, behavioural, as well as somatic aspects of anxiety. This enabled us to investigate in what area of anxiety the improvements occurred. A limitation is that this instrument is not as commonly used in effectiveness studies on anxiety as the State-Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch, Lushenem Vagg, & Jacobs, 1983). Our outcomes are therefore not easy to compare to (anxiety) outcomes of other studies.
A more important limitation is the risk on performance bias as blinding is not feasible in art therapy, like in other psychotherapeutic interventions. According to Munder & Barth (2017), the risk can be lowered by using an active treatment as control. We used a waitlisted (inactive) control group, which is the most logical first step in this young research domain. A placebo effect may therefore have biased the results in that the effect of treatment may be overestimated. Important aspects that may have influenced the observed effectiveness are expectations and motivation of the participants. Positive expectations lead to more positive self-evaluation. It is likely that the study population consisted of women who have (at least some) affinity with creativity and/or art making, because the participants applied for this trial themselves. This resulted in a study population that might have had positive expectations of the therapy. It is estimated that a positive expectation causes 15% of the effects of psychotherapy (Asay & Lambert, 1999), because these expectations can lead to a more

positive self-evaluation of mental health (Taylor & Brown, 1988). Motivation is also known to be an important factor in therapy success (Gordon, 1976; Hubble, Duncan & Miller, 1999) and contributes to the improvement of general health and wellbeing (e.g. Miller, Benefield & Tongan, 1993; Deci, Vallerand, Pelletier, & Ryan, 1991; Pelletier, Tuson & Haddad, 1997). Thus, the therapeutic effect of AT may be somewhat overestimated in our study. In psychotherapy it is argued that 'treatment' leads to better outcomes than 'no treatment', due to non-specific treatment factors (e.g. empathy, warmth, attention) (Bjornsson, 2011; Wampold, 2001). It might therefore be obvious that the AT participants improved compared to the WL participants. However, based on the work by Kiene (2013), there are some arguments that support the hypothesis that the observed effects are not only caused by non-specific treatment factors, but can (partly) be attributed to the specific effect of AT: the effect size is large, the effect occurs relatively fast (within 3 months, compared to the mean duration of anxiety of 17.6 years), the effects remain at follow-up (3 months), the effects were repeated in the second treatment group (the previous WL group), and there is evidence of a rational working mechanism (AT contributes to better *acceptance of emotions* and improved *goal-oriented action*, leading to improvement of ER skills) that is in line with AT expertise and literature. Another important limitation is that our study does not provide insight in the specific art therapy factors that contributed to the observed effects. Our study provides some information about the content of the intervention, but treatment goals from the list are not connected to general accepted theories and a rationale for the deployed artistic exercises cannot be provided at this point. This should be subject of future studies, aimed at further opening-up the black-box of art therapy. A final limitation is that we were not able to perform subgroup analyses per subtype of anxiety, due to small subgroups and overlap in diagnostic groups, since multiple diagnosis applied to all subjects.

Generalizability

The study of a complex intervention, utilizing customized care within a range set by professionals, strengthens the external validity of the results. The study population consisted mainly of moderate to highly educated women, with multiple anxiety diagnoses, moderate to severe anxiety symptoms and a long duration of symptoms. Individuals with high levels of anxiety, comorbidity and a long duration of symptoms generally have low therapy success rates (e.g. Mululo, Menezes, Vigne & Fontenelle, 2012). The outcomes of our study indicate

that this complex population benefited from AT, indicating that AT can be an option for this specific group of patients, and might also be beneficial for less complex anxiety patient groups. Anthroposophic AT is a treatment that is tailored to the individual, with could partially explain the positive results: patients with severe symptoms, comorbidities and a chronic course appear to be better treatable with a therapy that is adapted to the individual, in terms of intensity and focus (Newman, Llera, Erickson, Przeworski & Castonguay, 2013).

Participants applied for this trial themselves. It is therefore likely that the study population consisted of women who have (at least some) affinity with creativity and/or art making and were motivated to try this therapy. It is not clear if the results are generalizable to less motivated women with anxiety. Since only women were included, the results are not generalizable to men.

The tested art therapy intervention was only executed by trained AAT professionals who are able to individualize the treatment within the boundaries of the described goals, means and exercises, based on consensus within the professional organization. Therefore, the tested intervention is representative of for the AAT treatment of anxiety. Based on the encouraging results of our study, AT as an optional treatment for anxiety can be continued in clinical practice.

Future perspectives

Further studies are needed to strengthen the evidence base for AT in the treatment of anxiety. Studies with active controls are recommended, since this reduces the risk of bias due to the lack of blinding. A sham treatment could correct for the effect of 'being treated'. AT should also be compared to treatment as usual (e.g. CBT). To assess the long-term effects of AT, longer follow-up periods (>6 months) are needed.

In future RCTs, the inclusion criteria may be narrowed down to further explore the effects of AT on specific anxiety disorders. The use of more objective measures, like physiological measures of anxiety, in addition to the present measures are also recommended. In future studies executive functioning may be included to further unravel the working mechanisms of AT as it is known that EF is negatively influenced by anxiety (Fujii et al., 2013).

Further studies aimed at the therapeutic content of AT are needed to provide insight into art therapy-specific factors that contribute to the observed effects. AAT could also be compared to other types of AT. Studying the cost-effectiveness of AT compared to treatment as usual

(CBT, pharmacotherapy, or a combination of both), is important to ascertain the contribution of AT to value-based healthcare. Finally, client experiences, obtained through in-depth interviews, can give additionally insight in the subjective value of this treatment for patients and the specific treatment factors that contribute to the reduction of anxiety symptoms and the improvement of QoL.

Conclusions

1. Three months (10-12 sessions) AT is superior to waiting list condition in reducing anxiety symptoms and improving QoL in adult women with anxiety disorders GAD, SAD and/or PD and moderate to severe anxiety symptoms. These effects remain at three months follow-up.
2. Positive changes in emotion regulation, especially in the acceptance of emotions and in improved goal-oriented action, account for 46% of the reduction of anxiety symptom severity.
3. To obtain high quality evidence for effectiveness of AT, RCTs with active controls (treatment as usual) and RCTs on cost-effectiveness are needed.

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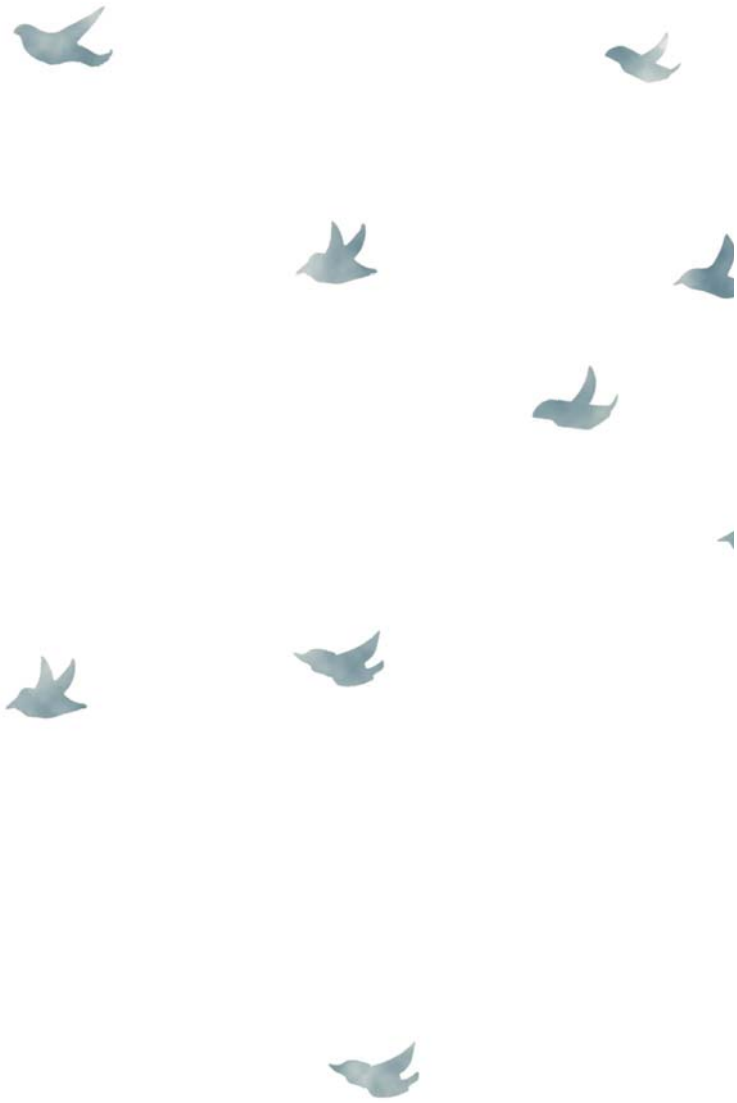
“I always had the feeling: I AM the fear, it is everywhere. But now I feel where it is in my body and it is just a part of me.”
(Female participant, 31 years old)



Chapter 4

Anxiety reduction through art therapy in women. Exploring stress regulation and executive functioning as underlying neurocognitive mechanisms

Manuscript in press:
Abbing, A.C., de Sonneville, L., Baars, E.W., Bourne, D.A.N., & Swaab, H. (in press). Anxiety reduction through art therapy in women. Exploring stress regulation and executive functioning as underlying neurocognitive mechanisms. *PloS ONE*.

Abstract

Objectives: To explore possible working mechanisms of anxiety reduction in women with anxiety disorders, treated with art therapy (AT).

Methods: A RCT comparing AT versus a waiting list (WL) condition on aspects of self-regulation. Stress regulation (heart rate and heart rate variability) and executive functioning (daily behavioural and cognitive performance aspects of executive functioning (EF)) were evaluated in a pre-post design. Participants were women, aged 18-65 years with moderate to severe anxiety symptoms.

Results: Effectiveness of AT compared to WL was demonstrated in a higher resting HRV post treatment, improvements in aspects of self-reported daily EF (emotion control, working memory, plan/organize and task monitor), but not in cognitive performance of EF, stress responsiveness and down regulation of stress. The decrease in anxiety level was associated with improvements in self-reported daily EF.

Conclusions: AT improves resting HRV and aspects of EF, the latter was associated with art therapy-related anxiety reduction.

Introduction

Every person experiences fear and anxiety in life to some degree, but for people with an anxiety disorder, the anxiety increases over time, is disproportionate to the actual danger or threat and becomes permanent (American Psychiatric Association, 2013).

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) distinguishes between different types of anxiety disorders. The most common anxiety disorders are phobias, followed by social anxiety disorder (SAD), generalized anxiety disorder (GAD) and panic disorder (PD) (Anxiety and Depression Association of America, 2018). Although the anxiety disorders may have different triggers, they share underlying features (Cisler, Olatunji, Feldner, & Forsyth, 2010; Rosellini, Boettcher, Brown, & Barlow, 2015). An important feature that applies to all anxiety disorders is the exaggerated cognitive appraisal that is associated with the threatening situation: hyper-alert cognitive schemes lead to pathological anxiety (Beck & Haigh, 2014).

Anxiety consists of physiological, emotional and cognitive aspects, and arises from specific personal characteristics combined with genetic, neurobiological and social factors (Hassink-Franke et al, 2012), including hypersensitivity to stress and the tendency to experience strong negative emotions (nervousness, sadness, anger). According to Clark and Watson (1991), anxiety is characterized by negative affect (NA) and high physiological hyperarousal (PH).

Treatment of anxiety is often aimed at changing maladaptive beliefs through cognitive behavioural therapy (Hofmann & Smits, 2008; Smits, Julian, Rosenfield, & Powers, 2012) and/or reducing anxiety symptoms through medication.

Art therapy (AT) is also often provided in anxiety disorders, although little is known about the effectiveness. AT is a non-verbal, so-called 'experience-oriented' intervention that uses the visual arts (e.g. painting, drawing, sculpting, clay modelling) and is provided as standalone therapy or in multidisciplinary treatment programs for anxiety disorders. Outcomes of a RCT comparing three months AT with three months waiting list condition in women with anxiety disorders showed that anxiety symptoms can be reduced by AT and that there are indications that improved perceived emotion regulation plays a role in this reduction (Abbing, Baars, De Sonneville, Ponstein & Swaab, 2019). However, other aspects of self-regulation may also play a role in the reduction of anxiety symptom severity. As discussed above, individuals suffering

from anxiety have also problems concerning stress regulation and difficulties with cognitive regulation, expressed as executive functioning.

Anxiety disorders and stress regulation

Stress regulation concerns dealing with stressors. People with anxiety problems usually have stress responses that are typically accompanied by sweating, shaking, dizziness and increased heart rate (Kazdin, 2000). These physical reactions are driven by the autonomic nervous system in the presence of a stressor. An indicator for the functioning of the autonomic nervous system is heart rate variability (HRV), which refers to the fluctuations in heart rate, also known as the variation in time between heartbeats (InterBeat Interval) (Akselrod, Gordon, Ubel, Shannon, Barger, & Cohen, 1981; Cohen et al., 2000). Parasympathetic influences from the brainstem alter the heart rate, and HRV is thus an index of cardiac flexibility (Porges 2007). HRV decreases with age and cardiac comorbidities and increases with physical activity (Numan, Sanderlock & Brodie, 2010). During stress, HR increases and HRV decreases due to more sympathetic and less parasympathetic activation.

High HRV, expressing more variation in time between heart beats, is seen as an indicator for a well-functioning autonomic nervous system, which can respond to varying demands in different situations (Appelhans & Luecken, 2006; Cohen et al., 2000). HRV at rest (resting HRV) reflects self-regulation ability (Segerstrom & Nes, 2007).

A review of 36 studies into the relationship between the presence of anxiety symptoms and HRV, in people with anxiety disorders compared to control groups without anxiety symptoms (Chalmers, Quintana, Abbott & Kemp, 2014), reported that the presence of an anxiety disorder is significantly associated with lower HRV. This was the case for people with generalized anxiety disorder (GAD), social anxiety disorder (SAD) and panic disorder (PD). Lower resting HRV is associated with PD, SAD (Pittig, Arch, Lam & Craske, 2013) and GAD (Levine et al., 2016; Pittig et al., 2013). Lower HRV indicates autonomic inflexibility and deficits in anxiety related inhibitory processes (Pittig et al., 2013). Resting HRV is lower in individuals that worry more (Brosschot, Van Dijk, & Thayer, 2007) and have high (trait) anxiety (Miu, Heilman & Miclea, 2009). Decrease of HRV is shown in conditions of stress (e.g. time pressure), emotional strain and increased anxiety (Nickel & Nachreiner, 2003frien). Based on these findings, heart rate and heart rate variability are considered physiological indicators of stress and anxiety (Huijbregts et al., 2011). An increase in heart rate may be an indication of an increased

emotional state (Cacioppo, Tassinary, & Berntson, 2007).

Anxiety disorders and executive functioning

A risk factor in the development and persistence of anxiety disorders is a limitation in executive skills (Sharp, Miller & Heller, 2015). Executive functions (EFs) are cognitive processes that are necessary for efficient and goal-oriented behaviour. Important EF components are inhibition (the ability to stop and / or slow down behaviour (actions and thoughts)), working memory (the collection of cognitive processes that keep information temporarily accessible in order to perform mental tasks), cognitive flexibility (changing and adjusting behaviour) and planning (being able to think ahead and subdivide the process into intermediate steps towards a goal) (Miyake & Friedman, 2012; Lezak et al., 2012; Huizinga, Burack & Van der Molen, 2010). Although the body of knowledge on the relationship between anxiety and EF is small, it is assumed that anxiety disorders may be the result of suboptimal cognitive regulation processes involving executive functioning. Difficulties with inhibition are found to be associated with higher levels of anxiety symptoms. EFs are also thought to be involved in the risk for developing social anxiety (Gladstone, Parker, Mitchell, Wilhelm, & Malhi, 2005) and adults with a generalized anxiety disorder are found to have more difficulties with inhibition than healthy controls (Hallion, Tolin, Assaf, Goethe, & Diefenbach, 2017).

Present study

There is already some evidence for anxiety symptom reduction through art therapy (Abbing et al., 2019). To gain further understanding of other regulating processes that might play a role in the reduction of anxiety symptoms through AT, the question is addressed whether stress regulation and executive functioning improve as a result of AT and whether these mechanisms are related to the reduction of anxiety symptoms.

Some studies suggested a possible stress regulating effect of AT, since AT is thought to promote relaxation (Kaimal, Ray & Muniz, 2016; Sandmire, Gorhan, Rankin & Grimm, 2012). AT is also believed to improve several aspects of executive functioning, like inhibition, because it is supposed to contribute to decrease of (a.o.) impulsivity (Haeyen, Van Hooren, Van der Veld & Hutschemaekers, 2018a; 2018b).

Based on these studies and expert opinions we hypothesized that AT treatment contributes to better stress regulation, because AT is thought to induce relaxation, presumably

comparable to mindfulness (Brown & Ryan, 2003; Egger et al., 2015) and may thus have a dampening effect on the arousal. This could become visible in a lower stress response, improved down regulation after facing a stressor and as a generally lower stress level which is reflected in a higher HRV at rest.

AT may also improve cognitive regulation, which can be reflected in improvement of several aspects of executive functioning, like inhibition, sustained attention, flexibility, working memory and task monitor, because these competences are needed to perform artistic exercises and are thought to be practiced and trained during the therapy process.

Materials and Methods

In a RCT design, comparing three months AT with three months waiting list condition in women with anxiety disorders, psychophysiological outcomes (stress responsivity) as well as daily behavioural and cognitive performance aspects of executive functioning were measured. Data on stress responsivity and executive functioning were collected as part of a single-blind RCT on the effectiveness of AAT in women with anxiety disorders. Detailed information about the study is reported elsewhere (Abbing et al., 2019). The study was approved by the Medical Ethics Committee of the Leiden University Medical Centre, the Netherlands (NL36861.018.11) and the trial was registered in the Dutch Trial Registration Registration (https://www.trialregister.nl/trial/6661).

Sample, randomization and intervention

Included were adult women, aged 18-65, with a primary diagnosis of generalized anxiety disorder, social phobia and/ or panic disorder (with or without agoraphobia) and with moderate to severe anxiety symptoms (scoring >7 for anxiety and/or >10 for distress on the Four Dimension Symptoms Questionnaire (4SDQ) [39]. Patients were excluded if they were aged less than 18 years or older than 65 years, had psychosis or hallucinations, alcohol or drug addiction, suicidal risk, brain pathology. All participants were recruited through posters/flyers in the practices of family doctors and by social media.

Sample size

Based on a pre-post measurement difference in the primary outcome of 15% (considered to be a clinically relevant LWASQ total score reduction), an alpha of 0.05, a power of 0.80 and a dropout rate of 15%, the sample size was calculated: 60 participants in total (30 participants per group) (http://clincalc.com/stats/samplesize.aspx).

Randomisation method and allocation concealment

A pre-stratification procedure was executed with four strata: use of psychotropic drugs (yes/ no), moderate or severe depression symptoms (4SDQ: depression >6) (yes/ no). After pre-stratification, through block randomization (blocks of 2), participants were at random assigned to either the treatment group (AT) or the control group (WL), according to a computer-generated list (www.randomization.com). Blinding of art therapists and participants was not possible.

The study took place at 25 private art therapy practices spread throughout the Netherlands, in the period between January 2017 and March 2018.

A total of 59 women was included between January and July 2017. After pre-stratification on comorbid depression symptom level and psychopharmaceutical use, randomization resulted in an experimental group of 30 participants and a control group of 29 participants.

Intervention

The experimental group (AT group) received 10-12 sessions AT of one hour each, during a period of three months. The specific intervention type was anthroposophic art therapy. The control group (WL) was wait listed for three months. In order to assure that the intervention tested in the study was representative for the general approach of this type of AT, only qualified and registered Dutch anthroposophic art therapists, with more than five years' experience in working with adults with anxiety, treated the participants.

Study population

During the study, 12 patients (20%) dropped out and 47 patients (80%) completed the trial. Dropouts concerned six from AT group and six from WL group, due to lack of time (n=3), not willing to wait for the intervention (n=3), hospitalization or physical illness (n=3), non-response

(n=2) and migration (n=1). There were no significant differences between dropouts and completers on baseline parameters (T0), so per-protocol analysis was justified.

The participants in the two groups did not differ on key variables, including age, diagnosis, use of medication, occupation, education and familiarity with anthroposophic healthcare and outcome variables at baseline. The analysed sample of 47 patients had a mean age of 44.4 years (SD=14,0), moderate to severe anxiety symptoms: 11.2 (SD=4.6) and a mean duration of anxiety symptoms of 17.6 years (SD=18.9) (range: three months - 64 years (lifetime)). Medication for anxiety was used by 15 participants. Multiple diagnoses applied to all participants: 25 participants met the criteria for the diagnosis GAD, 21 for social phobia and 28 for panic disorder. Ten participants suffered from (comorbid) PTSD, five participants had current comorbid depression and 16 patients experienced one or more depressive episodes prior to this study.

Procedure

The study contained two measurement waves: pre- and post-treatment, three months apart, which consisted of online questionnaires and home-visits with physiological and neuropsychological measurements. The online questionnaires were completed prior to the home-visit. The protocol during the two home-visits at T0 and T1 included the measurement of stress regulation and of performance-based executive functioning. The measures at the home-visits were taken by trained research assistants who were unaware of allocation. Outcome assessors who judged and analysed the results were blinded as well.

Measures and Instruments

Measures of stress regulation

Stress regulation was measured as stress responsiveness (response and recovery), with physiological responses using a Biopac MP150 Acquisition System (Biopac Systems Inc., Santa Barbara, CA) during a stress-evoking task (Fig 1), based on the Trier Social Stress Test (Kirschbaum, Prike & Helhammer, 1993). The TSST is developed to measure regulation of the autonomic nervous system (ANS) during stress.

Stress-evoking task, consisting of three phases:

1.) *Resting phase*: relaxing for three minutes in silence, with calm piano music through headphones.
2.) *Stress induction phase*:
    - Instruction: participant was asked to prepare a presentation of three minutes with a beginning, middle and end. This presentation could be about one of these topics: Dutch politics, Dutch healthcare, the American elections, climate change or the refugee problem. It was said that the presentation would be filmed and that this video would be assessed by professors from Leiden University. Attention would not only be paid to content, but also to posture and use of voice.
    - Preparation: the participant could prepare for five minutes. Preparation notes were allowed, but these could not be used during the presentation.
    - Presentation: the participant was asked to stand and present for three minutes. The research assistant pretended to film the presentation with a phone. However, it was not actually filmed.
3.) *Cool down phase*: the participant was told that she had done well and could relax, while sitting in silence during five minutes.

After completion of all tasks at the second home-visit, participants were debriefed and explained that they were not recorded and would not be judged.

Figure 1. Content of the stress-evoking task

Heart rate (HR), and heart rate variability (HRV) were recorded responses. Three ECG electrodes were attached to the chest, one located near left mid-clavicular line directly below the clavicle, one near the right mid-clavicular line and one between 6th and 7th intercostal space on left mid-clavicular line. To stabilize the ECQ signal, a 2 Hz high pass filter and a 50 Hz notch filter were applied in *AcqKnowledge* software (version 0.3.0, Biopac System Inc). R-peaks and IBIs were visually inspected and manually corrected by two researchers (AA and DB). The corrected recordings were analysed using the PhysioData Toolbox, a MATLAB-based application (Shak-Shie, 2017). For each phase (baseline, stress and cool down) we calculated mean HR: mean of the continuous HR, as interpolated for the accepted Inter-Beat-Interval (IBI) data point, and HRV_{rmssd}: the square root of the mean squared differences between successive IBIs (nonadjacent IBIs disregarded). HRV is the variability in the distance between R peaks, RR-interval or Inter-Beat-Interval (IBI) and refers to beat-to-beat alterations in heart rate (HR). It is a measure of both sympathetic and parasympathetic influences on the heart (Levine et al., 2016) and is related to emotional arousal (Nickel & Nachreiner, 2003).

The Root Mean Squared Successive Differences (RMSSD) of the HRV was used as this is the recommended measure for calculating high frequency HRV from recordings of several minutes since this measure is indicative for parasympathetic nervous system and is most commonly used and preferred to pNN50, as it has better statistical properties (Camm et al, 1996). Normal RMSSD mean value in a healthy population is 42ms (range 19-74) (Nunan, Sandercock & Brodie, 2010). Because of the vulnerability of the study population, it was decided that the experiment would be stopped immediately if the subject indicated that she wanted to stop. Also, when research assistants observed or suspected a too anxious, confused or emotional state, the subject was asked if she wanted to stop the experiment, and if so, it was stopped.

Measures of executive functioning

We used two measures of executive functioning: behavioural EF and cognitive EF. The daily behavioural EF was measured with a self-report questionnaire (BRIEF-A) and cognitive aspects of EF were measured with performance-based measures (subtests of the Amsterdam Neuropsychological Tasks (ANT)).

Behavioural aspects of daily executive functioning

The Dutch version of the Behaviour Rating Inventory of Executive Function for Adults (BRIEF-A) was used to measure various aspects of daily executive functioning (Roth, Isquith & Gioia, 2005). The BRIEF-A is a questionnaire developed for adults, and it consists of 75 items with nine clinical scales that measure various aspects of EF: four behavioural regulation scales and five metacognition scales. The behaviour regulation scales are: *inhibit*: ability to control impulses (inhibitory control) and to stop engaging in a behaviour; *shift*: cognitive flexibility, ability to move freely from one activity or situation to another; to tolerate change; to switch or alternate attention; *emotional control*: ability to regulate emotional responses appropriately; and *self-monitor:* ability to keep track of the effect of one's own behaviour on other people. The metacognition scales are: *initiate*: ability to begin an activity and to independently generate ideas or problem-solving strategies; *working memory*: ability to hold information when completing a task, when encoding information, or when generating goals/plans in a sequential manner; *plan/organize*: ability to anticipate future events; to set

goals; to develop steps; to grasp main ideas; to organize and understand the main points in written or verbal presentations; *organization of materials*: ability to put order in work, play and storage spaces (e.g. desks, lockers, backpacks, and bedrooms); and *task monitor*: ability to check work and to assess one's own performance. T-scores were calculated from the raw scores. The ranges for the clinical scales are: <60 normal; 60-65 subclinical; >65 clinical (Roth, Isquith, & Gioia, 2005).

Cognitive performance-based aspects of executive functioning

The Amsterdam Neuropsychological Tasks (ANT) is a computer-aided assessment that allows for the systematic evaluation of neuropsychological performance (De Sonneville, 1999). It has been proven to be a sensitive and valid tool in research on executive functions. Test–retest reliability and validity of the ANT-tasks are satisfactory and have been extensively described elsewhere (e.g. De Sonneville 2014; Rowbotham, Pit-ten Cate, Sonuga-Barke, & Huijbregts 2009).

A test battery of three tasks was chosen for this study: Baseline Speed (BS), Shifting Attention Set Visual (SSV) and Sustained Attention Dots Patterns (SAD). These tasks cover the following neuropsychological domains: alertness (intensity of attention) (BS), inhibition / mental flexibility (SSV) and sustained attention (continuous performance) (SAD). These tasks are shortly described, for detailed information including illustrations, see De Sonneville, Boringa, Reuling, Lazeron et al. (2002).

The BS task is a simple reaction time task, measuring of 'intensity' aspects of alertness and attention, as described by Konrad, Günther, Hanisch & Herpertz-Dahlmann (2004). On the screen a (fixation) cross is continuously projected. This cross changes unexpectedly into a square requiring the participant to press a mouse key as fast as possible, after which the square turns into a cross again, and this is repeated in 32 trials. Main outcome parameters are reaction time (RT), reflecting alertness, and the response speed stability (SD of RT), reflecting fluctuation in alertness.

The SSV task aims at measuring inhibition and attentional flexibility. The signal consists of a horizontal bar that is permanently present on which a square jumps randomly to the left or the right. In part 1, participants have to copy the movement of a green-coloured square (press

left/right button on a left/right move). In part 2, participant have to do the opposite, i.e. 'mirror' the movement of a red-coloured square, and in part 3, the square randomly changes colour, requiring participants to either copy or mirror the movement of the square. The contrast between performances in part 1 and part 2 reflects inhibitory control; the contrast between performances in part 1 and part 3 (compatible responses) reflects cognitive flexibility, with larger values indicating poorer performance. Main outcome parameters of the SSV task are reaction time and accuracy (percentage of errors).

The SAD task measures sustained attention, i.e. the ability to keep performance at a certain level during a longer period of time. In this task, 600 dots patterns with 3, 4, or 5 dots appear on a computer screen in 50 series of 12 trials, each consisting of three 3-dots, 4-dots, and 5-dots patterns, presented in a pseudo random order. Participants are required to respond to 4-dots patterns by pressing a mouse key with their preferred hand ('yes'-response) and to press the other mouse key with the non-preferred hand ('no'-response) whenever 3- or 5-dots patterns are shown. Inaccurate responses, misses ('no'-responses to 4-dots) and false alarms ('yes'-responses to 3 or 5 dots) are directly followed by a beep signal. Task duration is approximately 15–20 min. Main outcome parameters are tempo (mean series completion time across 50 series), accuracy, and fluctuation in tempo. Fluctuation in tempo, the WS subject SD of 50 completion times, is taken as the primary index of sustained attention. As participants were informed about errors by a beep signal, and correct responses following an error are separately registered, post-error slowing (sensitivity to feedback) can be estimated.

Measure of anxiety symptoms

The Dutch version of the Lehrer Woolfolk Anxiety Symptom Questionnaire (LWASQ) (Lehrer & Woolfolk, 1982) was used to measure the anxiety level. The LWASQ is a self-report, generic anxiety instrument with 36 questions which assesses the cognitive (worry and rumination), behavioural (avoidance) and somatic (physical symptoms) aspects of anxiety. In the present study, the difference between pre- and post-measurement was used for further analysis.

Statistical Analysis

Statistical analyses were conducted using SPSS statistics (version 23.0) (IBM corp, 2015). All data was checked for normal distribution using the Shapiro Wilk test, Q-Q plot and histogram.

Missing values

Reasons for missing values were reported. Dropouts were compared to completers using pre-test measures on age and anxiety score, by use of independent students t-tests. No significant differences were found, so missing cases were listwise deleted and per protocol (PP) analyses were performed for all outcomes.

Evaluation

The following hypotheses were tested:

1) AT results in higher resting HRV
2) AT results in a lower stress response: lower increase in HR and lower decrease in HRV from baseline to stress phase, respectively
3) AT results in faster recovery (HR) during cooling down
4) AT leads to improvements on self-reported daily EF
5) AT leads to improvements on performance-based EF
6) The reduction of anxiety symptoms is associated with improvements in stress recovery
7) The reduction of anxiety symptoms is associated with improvements of EF

Evaluation of treatment effects – stress regulation

To determine if the stress paradigm did work, we evaluated the changes in HR and HRV from resting to stress and cool down phase, with all subjects of waitlist and treatment groups included. Expected were an increase in stress level at the start of the stress induction phase (shown as increase of HR and decrease of HRV) and a decrease during the cool down (shown as decrease of HR and increase of HRV). This was tested with a general linear model repeated measures analysis for variance (RM-ANOVA), with Test phase (resting, stress induction, cooling down) as within-subject (WS) factor and the pre-test HR and HRV_{RMSSD} as dependent variable respectively, using a repeated contrast (resting vs. stress induction, stress induction vs. cooling down).

To examine hypothesis 1, we tested whether the therapy had influenced resting HRV (resting phase) by using a RM- ANOVA with Test moment (pre- vs. post-test) as WS factor, Group (AT vs. WL) as BS factor and resting HRV_{RMSSD} as dependent variable.

Hypothesis 2 was tested using a RM-ANOVA with Test moment (pre- vs. post-test) as WS factor, and Group (AT vs. WL) as BS factor, with stress response (stress induction HR minus

resting HR) as dependent variable. The same procedure was followed for HRV_{RMSSD} (stress induction HRV minus resting HRV).

To examine hypothesis 3, to test whether the experimental group improved on downregulation (recovery speed), we divided the Cooling down phase in nine slices of 30 seconds each and analysed changes in HR during using a RM-ANOVA with the Cooling down phases (slice 1-9) and Test moment (pre- vs. post-test) as WS factors, Group (AT vs. WL) as BS factor, and HR as dependent variable.

Evaluation of treatment effects – executive functioning

To examine hypothesis 4, a RM-ANOVA was performed, using Test moment (pre- vs. post-test) as WS factor and Group (AT vs. WL) as BS factor, with BRIEF-A subscale (T) scores as dependent variables, respectively.

To establish whether the study population deviated from the norm on performance-based EF measured with the ANT, we performed a MANOVA, with the z-scores of alertness (speed, fluctuation in speed), inhibition and flexibility (reaction time, error percentage) and sustained attention (tempo, fluctuation in tempo, error percentage) as dependent variables, using the intercept test for deviations from zero.

Subsequently, the treatment effects were evaluated (hypothesis 5) by means of RM-ANOVAs with Group (AT vs. WL) as BS factor and Test moment (pre- vs. post-test) as WS factor, and the outcomes on alertness (reaction time, fluctuation in reaction time) and sustained attention (tempo, fluctuation in tempo, error percentage) as dependent variables respectively. To analyse treatment-related changes in inhibition and flexibility, differences scores were computed for Inhibitory control and Cognitive flexibility, for both reaction time and error percentages. These dependent variables were analysed with RM-ANOVAs, with Group (AT vs. WL) as BS factor and Test moment (pre- vs. post-test) as WS factor. An effect size of 0.01-0.06 is considered a small effect, 0.06-0.14 a medium effect, and >0.14 a large effect in RM analysis (Borenstein, 2009).

Exploration of associating factors

The sample size was calculated based on our primary aim to study the effectiveness of art therapy. The secondary aim was to explore factors influencing anxiety reduction (testing hypotheses 6 and 7). For this purpose, correlations were computed between the reduction in

anxiety score and the pre-post treatment differences in EF, and aspects of stress regulation (HR and HRV). Only those aspects of EF and stress regulation that were demonstrated to improve significantly after treatment within the experimental group were entered in the correlation analysis. Only variables that significantly correlated with anxiety reduction were subsequently entered in regression analysis. Hierarchical regression analyses were planned to examine whether improvements of EF and stress recovery contributed to anxiety symptom reduction. To examine baseline predictors of anxiety symptom reduction, regression analyses were planned with the primary outcome variable (pre-post treatment difference in anxiety symptom severity) compared to baseline variables (pre-treatment values).

Results

Anxiety symptom severity

In a previous paper (Abbing et al., 2019), that reported on this RCT, was shown that anxiety symptom severity was significantly reduced in the AT group but not in the WL group [$F(1,45)=11.49$, $p=0.001$, $\eta_p^2= 0.20$].

Stress regulation

A number of measurements of participants (n =11) could not be used due to a very distorted signal (n=6) or uncompleted tests due to refusal or impossibility of participants to complete the paradigm (n=5). To investigate whether there were outliers, the 1.5 x interquartile distance rule (IKA) was used. Analyses are carried out both with and without outliers. Because this did not yield different results, the outcomes of the analyses with outliers are reported.

Evaluation of stress paradigm

The first WS contrast (resting vs. stress induction) revealed a significant effect for HR [$F(1,51)=158.72$, $p<0.0001$, $\eta_p^2=.757$] and HRV [$F(1,51)=5.666$, $p=0.021$, $\eta_p^2=.100$], respectively, with HR increasing from [mean (SD)] 69,59 (9,58) to 90,28 (15,96), and HRV decreasing from [mean(SD)] 40,02 (25,29) to 29,25 (25,25). The second contrast (stress induction vs. cool down) showed a significant effect for HR [$F(1,51)=166.47$, $p<0.0001$, $\eta_p^2=.765$] and HRV [$F(1,51)=6.342$, $p=0.015$, $\eta_p^2=.111$], with HR decreasing from [mean(SD)]

90,28 (15,96) to 70,14 (9,83) and HRV increasing from 29,25 (25,25) to 42,27 (29,49). This confirms that the stress paradigm worked: an increase of HR is shown in the stress induction phase and a decrease is shown in the cool down phase as expected. The HRV decreases during stress induction and recovers during cool down.

Treatment effects on HRV

For HRV_{RMSSD}, the interaction effect Test moment*Group was trend significant [F(1,35)=3.96, p=0.054, η_p^2=.102], indicating that the AT group improved more than the WL group. This was further explored within the three phases. During *resting phase*, the interaction Test moment*Group was significant [F(1,35)=4.54, *p*=0.04, η_p^2=.115], reflecting that the AT group had a higher HRV during the resting phase at post treatment and the WL group had a lower HRV at T1, indicating improved HRV in AT group only (Table I).

For the *stress induction phase*, no significant Test moment*Group interaction was shown (*p*=0.81) and in the *cool down phase*, the Test moment * Group interaction on HRV was trend significant (*p*=0.068): the WL group appeared to have a lower HRV at T1, compared to T0, and the AT showed an increase of HRV at T1, indicating an improvement (Table I).

Treatment effects on stress responsivity (HR)

The RM-ANOVAs testing the treatment effects of AT on HR showed a significant main effect for Test moment, indicating an increase in HR from pre- to post treatment [F(1,35)=11.46, *p*=0.002, η_p^2=0.247], but no significant Test moment * Group interaction (*p*=.649) (Tabel I).

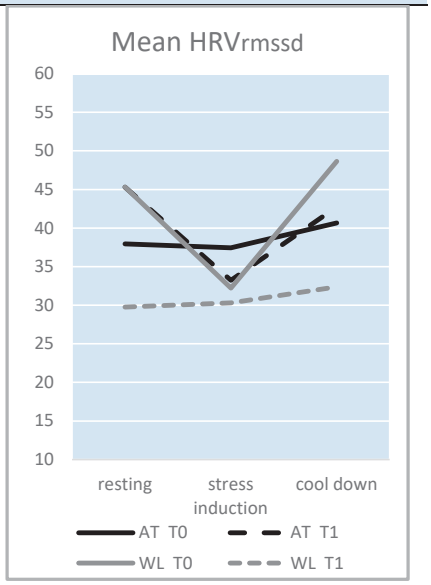
Stress response was calculated as the difference in mean HR between stress induction phase and resting phase. No significant differences is stress response were found between groups (*p*=0.444), indicating that there were no improvements in stress responsivity.

Treatment effect on stress recovery (HR)

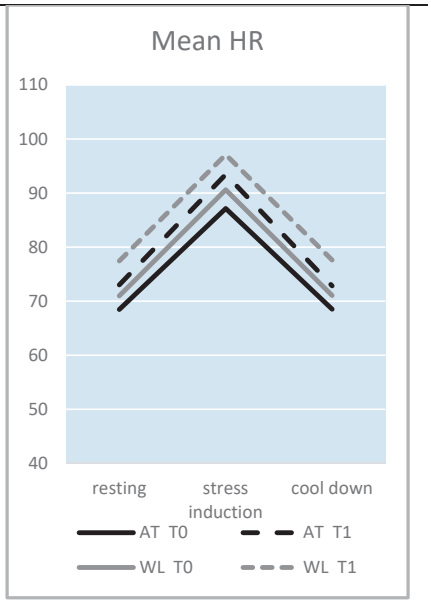
Stress recovery was calculated as the difference in mean HR between stress induction phase and cool down phase. No significant differences in stress recovery were found between groups (*p*=0.374), indicating that there were no improvements in stress recovery.To test stress recovery speed, the cool down phase was analysed in slices of 30 seconds. No differences between the groups were observed on HR, indicating that both groups did not differ in stress recovery speed.

Table I. Outcomes HRV and HR (stress regulation)
Mean, standard deviation at pre- and post-treatment (RM-ANOVA)

Measure and condition	T0 Mean (SD)	T1 Mean (SD)
HRV (RMSSD)		
Resting phase		
AT (n=19)	37,95 (26,80)	45,30 (40,41)*
WL (n=17)	45,33 (27,98)	29,76 (18,99)
Stress induction phase		
AT (n=19)	37,44 (31,24)	33,23 (33,66)
WL (n=17)	32,22 (24,85)	30,30 (28,54)
Cool down phase		
AT (n=19)	40,66 (26,57)	42,74 (28,62)
WL (n=17)	48,64 (34,39)	32,38 (23,32)



Heart rate (bpm)		
Resting phase		
AT (n=19)	68,45 (7,42)	73,00 (10,56)
WL (n=17)	70,97(10,93)	77,43 (9,95)
Stress induction phase		
AT (n=19)	87,14 (9,07)	93,45(10,89)
WL (n=17)	90,61 (15,80)	97,11 (14,58)
Cool down phase		
AT (n=19)	68,50 (8,09)	72,82(9,99)
WL (n=17)	71,06 (11,01)	77,59 (11,43)



p<0.05*

AT = treatment condition (3 months art therapy); WL= waiting list condition;
T0 = pre measurement; T1 = post measurement

Exploration of factors contributing to anxiety symptom reduction

The only aspect of stress regulation that improved (resting HRV) did not significantly correlate to anxiety symptom reduction, so mediators and predictors were not analysed.

Executive functioning – behavioural aspects

On the behavioural aspects of EF (BRIEF-A total score), the interaction effect Test moment*Group was significant: F(1,44)=8.27, p=0.006, with a large effect size (η_p^2=.16), showing that the total EF improved in the AT group but not in the WL group. Four of the nine subscales of the BRIEF showed significant interactions on Test moment*Group: *emotion control* [F(1,44)=4.26, p=0.045, η_p^2=.09]; *working memory* [F(1,44)=5.49, p=0.024, η_p^2=.11]; *plan/organize* [F(1,44)=5.87, p=0.020, η_p^2=.12] and *task monitor* [F(1,44)=10.79, p=0.002, η_p^2=.20], indicating that AT was effective in these domains. AT was not effective in the domains *inhibit* (p=0.13), *shift* (p=0.24), *self-monitor* (p=0.94), *initiate* (p=0.66) and *organization of materials* (p=0.56) (Table II).

Table II. Outcomes BRIEF-A (executive functioning)
Mean, SD, p-values and effect sizes from pre- to post-treatment (RM-ANOVA)

Measure and condition	**T0** **Mean (SD)**	**T1** **Mean (SD)**	**Time*Group** **F**	***p***	**Effect size** (partial η^2)
Executive functioning (total)					
AT (n=24)	67,83 (11,84)	62,61 (9,95)	8,27	.006	.16
WL (n=23)	61,09 (9,66)	61,48 (9,48)			
Metacognition index					
AT (n=24)	70,61 (13,56)	65,57 (10,54)	6,51	.014	.13
WL (n=23)	61,35 (10,87)	62,09 (10,89)			
Behaviour regulation index					
AT (n=24)					
WL (n=23)	61,48 (10,00)	56,78 (10.57)	3,29	.076	.07
Inhibit	59,30 (9,27)	58,35 (9,41)			
AT (n=24)					
WL (n=23)	56,17 (11,32)	53,87 (11,11)	2,,40	.129	.05

Shift	54,39 (8,48)	55,13 (9,32)			
AT (n=24)					
WL (n=23)	65,59 (11,30)	61,68 (12,09)	1,42	.240	.03
Emotion control	64,36 (11,71)	63,77 (10,65)			
AT (n=24)					
WL (n=23	61,48 (10.34)	56,65 (10,47)	4,26	.045	.09
Self-monitor	58,57 (9,68)	59,13 (10,57)			
AT (n=24)					
WL (n=23)	53,00 (10.34)	50,65 (8,89)	0,006	.936	.000
Initiate	52,30 (10.75)	49,78 (9,20)			
AT (n=24)					
WL (n=23)	68,48 (11,14)	64,70 (12,12)	0,20	.657	.005
Working memory	61,09 (11,79)	58,87 (14,28)			
AT (n=24)					
WL (n=23)	68,35 (12,56)	63,30 (10,59)	5,49	.024	.11
Plan/Organize	64,22 (11,23)	64,43 (10,74)			
AT (n=24)					
WL (n=23)	70,48 (14,15)	66,30 (12,20)	5,87	.020	.12
Task monitor	57,17 (10,92)	59,00 (9,91)			
AT (n=24)					
WL (n=23)	66,78 (14,69)	59,61 (11,75)	10,79	.002	.20
Organization of materials	56,30 (10,63)	59,22 (12,02)			
AT (n=24)					
WL (n=23)					
	62,78 (16,26)	61,04 (14,26)	0,35	.555	.008
	58,00 (10,62)	57,61 (11,21)			

Exploration of contributing factors

Only the variables that improved significantly in the AT group (analysed with a MANOVA intercept test) were added in a regression analysis with the LWASQ difference score (pre-post treatment). These variables were *shift* (cognitive flexibility), *emotion control, plan/organize*, *working memory* and *task monitor*. A backward regression analysis with these variables resulted in a significant model [$F(3,22)=13,09$, $p<0.0001$, $R^2=.674$], consisting of three subscales of the BRIEF, indicating that improvements in *emotion control* ($\beta=.364$, $t=2.54$,

p=0.020), *plan/organize* (β=.406, t=2.76, *p*=0.012), and *task monitor*, (β=.319, t=2.21, *p*=0.039), explained 67,4% of the variance in anxiety symptom reduction.

Predictors

To explore possible predictors of therapy success, baseline scores of the subscales were used in a backward regression analysis in relation to anxiety symptom reduction. This resulted in a significant model [F(2,20)=4,15, *p*=0.031, R^2=.293] consisting of two subscales of the BRIEF, showing that higher baseline scores of *shift* (β=.381, t=2.02, *p*=0.057) and *organization of materials* (β=.347, t=1.84, *p*=0.081) led to larger reduction of anxiety symptoms, suggesting that subjects who experience many problems with these EF aspects are more likely to benefit from AT.

Executive functioning – cognitive aspects

Intercept tests on baseline z-scores showed that some of the EF variables deviated significantly from the mean norm score, but were within normal range (-1 to 1): *fluctuation in tempo*: [mean(SD)] 0.37 (1,16); F(1,44)=4,61, *p*=0.037, η_p^2=.095; *accuracy (mistakes) in SSV1*: [mean(SD)] 0.63 (1.34); F(1,44)=10,35, *p*=0.002, η_p^2=.19; *accuracy of inhibition*: [mean(SD)] 0,80 (2,26); F(1,44)=5,68, *p*=0.022, η_p^2= .114; *accuracy of cognitive flexibility*: [mean(SD)] 0,68 (2,12); F(1,44)=4,64, *p*=0.037, η_p^2=.095.

The variable *impulsivity* falls within clinical range: [mean(SD)] 1,65 (1,65); F(1,44)=57,07, *p*<0.0001, η_p^2=.52. This indicates a clinical problem (poor inhibition) in this study population.

Treatment effects

Due to procedural errors, three cases were excluded from analysis, two from the AT group and one from the WL group. The RM-ANOVAs testing the treatment effects of AT on inhibition, cognitive flexibility and sustained attention showed no significant differences between experimental group and control group (0.15<*p*<0.91). Some of the tasks showed significant outcomes of test moment only, indicating a learning effect. This applied to *inhibition* (speed), *flexibility* (speed) and *sustained attention* (speed and stability), but not for number of errors on the tasks and stability in speed in the inhibition and flexibility tasks. Outcomes of the tasks (mean(SD)) are presented in Table III.

Table III. Outcomes of ANT tasks BS, SSV, SAD (mean(SD)).
Mean, SD, p-values and effect sizes from pre- to post-treatment (RM-ANOVA)

Measure and condition	T0 Mean (SD)	T1 Mean (SD)	Time*Group F	*p*	Effect size (partial η^2)
BS task					
Alertness					
Reaction time					
AT (n=23)	278 (42)	296 (43)	5,70	.229	.034
WL (n=21)	292 (38)	298 (41)			
Stability					
AT (n=23)	81,43 (53,32)	64,26 (33,65)	1.83	.183	.042
WL (n=21)	72,38 (32,04)	86,81 (84,35)			
SSV task					
Inhibition					
Reaction time (ms)					
AT (n=21)	280 (222)	251 (158)	2,12	.153	.050
WL (n=21)	358 (295)	220 (159)			
Accuracy (error%)					
AT (n=21)	10,71 (22,36)	4,29 (6,57)	1,79	.188	.043
WL (n=20)	8,21 (9,97)	9,40 (19,25)			
Cognitive flexibility					
Reaction time (ms)					
AT (n=20)	471 (254)	360 (168)	0,36	.550	.009
WL (n=21)	527 (285)	385 (199)			
Accuracy (error%)					
AT (n=20)	3,75 (14,86)	3,13 (6,97)	0,19	.668	.005
WL (n=21)	4,88 (10,62)	5,83 (10,96)			
SAD task					
Sustained attention					
Reaction time (ms)					
AT (n=22)	8,63 (1,69)	8,20 (1,42)	0,19	.666	.005
WL (n=20)	8,57 (1,92)	8.04 (1,59)			
Fluctuation in tempo					
AT (n=22)	0,98 (0,41)	0,76 (0,26)	0,10	.752	.003
WL (n=20)	0,96 (0,60)	0,77 (0,37)			
Accuracy (error%)					
AT (n=22)	4,14 (1,89)	4,23 (1,75)	0,01	.912	.000
WL (n=20)	4,15 (3,03)	4,29 (2,78)			
Behaviour regulation					
Post-error slowing (ms)					
AT (n=22)	297 (277)	181 (120)	0,12	.734	.003
WL (n=20)	314 (250)	223 (176)			

Exploration of contributing factors

Since no significant treatment effects on cognitive performance EF were observed, associations between performance EF and anxiety symptom reduction were not analysed.

Predictors

Performance-based inhibition scores at baseline did correlate to anxiety symptom reduction (r=-.416; *p*=0.043), indicating that that subjects with poorer inhibition showed a larger reduction of anxiety symptoms, suggesting these subjects are more likely to benefit from AT.

Discussion

In this explorative study, the effects of AT on stress responsivity and executive functioning were assessed in order to further study the effectiveness of AT in adult women with anxiety and to explore possible working mechanisms of this treatment. Data were collected as part of a single-blind RCT on the effectiveness of AT in women with anxiety disorders, comparing an experimental AT treatment group and a waitlist control group (Abbing et al, 2019).

Our first hypotheses that AT would contribute to better stress regulation, is partially supported. Subjects in the intervention group showed higher resting HRV after treatment, indicating a lower stress level and/or reduction of anxiety, meeting our expectation. The stress response measured after treatment was however as strong as before the treatment and no improvements in stress recovery were observed, contrary to our expectations.

Our second hypothesis that AT would result in executive functioning, was also partially supported. The results of the self-reported EF show that there were significant improvements in *emotion control*, *working memory*, *plan/organize* and *task monitor*, but the changes in AT group in the domains *inhibit, shift, self-monitor, Initiate* and *organization of materials* were not significant compared to WL group. Regarding performance-based cognitive EF, there were no significant post treatment differences between the experimental group and the control group on Inhibition, Cognitive flexibility and Sustained attention.

The third hypothesis, that improvements in stress regulation and EF were associated with anxiety symptom reduction, is only partly substantiated. Improvements in the self-reported EF domains *emotion control, plan/organize* and *task evaluation* were associated with anxiety symptom reduction, with an explained variance of 67,4%. Analysis of predicting factors demonstrated that lower Inhibition scores on performance EF at T0 were associated with

larger reduction of anxiety symptoms, and lower self-reported *cognitive flexibility* and *organization of materials* were associated with a larger anxiety reduction.

Interpretation and comparison to literature

The finding that improvement of resting HRV was shown in the experimental group, indicates an improved autonomic regulating ability (Appelhans, Luecken & Leucken, 2006; Friedman & Thayer, 1998) and, according to the Neurovisceral Integration Model, an improved ANS regulation (Thayer & Lane, 2000). The higher resting HRV in the experimental group may be indicative for a lower overall stress level. Because HRV is strongly associated with the presence of an anxiety disorder (Levine et al., 2016; Pittig et al., 2013), and HRV is positively correlated with adaptive emotion regulation, according to the Polyvagal Theory (Porges, 2007), the outcomes of this study substantiate our earlier finding: anxiety symptom reduction and improvement of emotion regulation (Abbing et al, 2019). Furthermore, there is neurophysiological evidence for associations between resting HRV and executive brain regions (Thayer, Åhs, Fredrikson, Sollers, & Wager, 2012). Resting HRV does not only represent overall health, but is also an index for the degree of brain flexibility concerning self-regulation processes, such as executive functions and cognitive control (Wiliams, Cash, Rankin, Bernardi, Koenig,, & Thayer, 2015; Williams, Feeling, Hill, Spangler, Koenig, & Thayer, 2017).

Subjects in the experimental group show the same stress response as before treatment and did not improve on stress recovery (down regulation). The fact that the stress response after treatment did not differ from before treatment, can have several explanations. Firstly, it is possible that subjects in the intervention group were just as sensitive/susceptible to stress induction as before treatment, leading to the preliminary conclusion that AT does not affect the direct stress response (stress responsiveness). In other studies was shown that the stress response did not differ between healthy populations, people with intense worry and patients with GAD (Fisher & Newman, 2013). This implies that the stress response itself cannot easily be influenced. Secondly, the treatment period (three months) might have been to short and the number of sessions (10-12) too little to cause significant changes in stress responsiveness. Thirdly, the Trier Social Stress task is originally developed to induce stress in healthy populations. A worry task (Levine et al., 2016) may also be suitable for this study population and may lead to other outcomes.

Another important outcome is that the treatment group experienced improvements in daily behavioural executive functioning in the domains emotion control, working memory, plan/organize and task monitor, but did not show pre-post treatment differences regarding performance-based executive functioning (Alertness, Inhibition, Cognitive flexibility and Sustained attention) compared to the control group. It is known that self-report measures are prone to a higher risk of bias / overestimation, due to positive expectations of the treated participants and to placebo effects, which are thought to account for 15% of treatment effects (Asay & Lambert, 1999). Positive expectations generally lead to a more positive self-evaluation of mental health (Taylor & Brown, 1988).

A possible explanation for not finding improvements in performance EF is that the study population was not in the clinical range on this aspect (except for Inhibition), meaning that there were no major problems with EF, thus making occurrence of improvement less likely. On the other hand, the small sample size may also have compromised the outcomes. It is not unlikely that significant improvements in accuracy (error percentages) of Inhibition and Cognitive flexibility can be found in a larger study population, because these variables improved in AT group and not in WL group.

The study population showed poorer Inhibition skills compared to a healthy study population, and subjects with larger Inhibition problems showed a larger anxiety reduction. This is consistent with several studies that showed that poor behavioural inhibition is associated with anxiety and high physiological arousal (e.g. Suveg, Morelen, Brewer, & Thomassin, 2010).

Hypothesis on working mechanisms of AT

Although there is still much unclear about the exact working mechanisms of AT, the forgoing results allow for the hypothesis that AT is effective in the treatment of anxiety symptoms due to the improvement of specific aspects of self-regulation. In our study, AT led to improvement in overall stress reduction (higher resting HRV), and the treated subjects reported improvements in several aspects of executive functioning; *emotion control, cognitive flexibility (shift), working memory, plan/organize* and *task monitor.*

This hypothesis can be substantiated by the body of knowledge on anxiety reduction, which states that both higher resting HRV and improvements in EF contribute to lower anxiety levels. These improvements are likely to be caused by the therapy. Firstly, creating visual art is linked to improved psychological resilience (i.e. stress resistance) on a neural level, due to

improvements in functional connectivity of the medial parietal cortex and the praecuneus (Bolwerk, Mack-Andrick, Lang, Dörfler, & Maihöfner, 2014). Secondly, specific skills are practiced during the artistic exercises, which are carefully chosen by the therapist. These exercises provide experiences within a safe environment and are not only intended to gain insight in emotions and responses, but are also intended to practice skills (van Hooren, 2018). These skills may be related to aspects of executive functioning: e.g. following instructions (working memory), working autonomously on an assignment (plan/organize), tracking and evaluating own actions during the art work (task evaluation), learn to interact with and adjust to the qualities of different art materials (shift), and learn to explore and regulate their emotions. This hypothetical working mechanism is substantiated by the finding that improvements of the aspects emotion control, plan/organize and task monitor contributed for 64,7% of the anxiety symptom reduction through AT.

Strengths, limitations and generalizability

Strengths of this study are that this is the first RCT on AT for anxiety studying clinical outcomes and working mechanisms, with both self-reported and objective measurements and analyses of outcomes and influencing factors. This study is important for the scientific underpinning of AT in general and for the AT treatment of anxiety disorders specifically. Based on this study, specific hypotheses on working mechanisms can be formulated that can be tested in further research.

A first limitation is the lack of an active control group. It is therefore not possible to conclude with certainty that the observed effects are caused by therapy-specific factors. Second, the relatively small sample size may have compromised the outcomes and may have led to non-detection of significant outcomes of stress responsivity and performance EF, or to non-detection of associations between improvement of resting HRV and anxiety reduction. Also, the outcomes of the regression analyses should be handled with caution since the small sample (n=22) that was used for these analyses compromises the generalizability of these results. Third, confounding and effect modifying factors such as cardiac comorbidities were not measured, which could have influenced the HRV outcomes. Fourth, the study population consisted of a specific subgroup: higher educated women, with a long duration of anxiety symptoms and probably with a specific motivation for the treatment, because the participants

applied for the study. This implies that the results are not generalizable to all women with anxiety, nor to men (Abbing et al., 2019).

Fifth, the study population was heterogeneous in nature, due to dimensional inclusion on anxiety symptom severity. Participants did not belong to one specific anxiety disorder classification, so conclusions on the effectiveness of art therapy for specific anxiety disorders cannot be drawn. Sixth, this study did not result in a clear substantiation of the working mechanism of art therapy, but led to preliminary hypotheses that need to be tested in further studies. Because the present study was explorative in nature and had a small sample size, straightforward analyses have been performed in order to detect promising areas for further study. Some insight into possible working mechanisms has been gained, but still many factors need to be considered before concluding on the exact working mechanism(s) of art therapy.

Future perspectives

Outcomes of this study show that AT is a promising intervention for anxiety disorders, but studies with active controls are needed to prove efficacy and cost-effectiveness of AT. Recommendations are the testing of specific hypotheses in larger samples, testing with other objective measures and/or a different psychophysiological protocol.

Hypotheses on working mechanisms generated from this study, regarding reduction of anxiety symptom severity through improvements in self-reported daily executive functioning, should be evaluated in future studies with larger samples, and should also include mediation and moderation analyses, and should control for confounding and effect modification. Associations between outcomes on emotion regulation and executive functioning, and emotion regulation and resting HRV, need to be explored as well in order to obtain a better understanding of the route along which art therapy reduces anxiety symptom severity.

Because this explorative study contained a limited set of outcome measures, other hypotheses on working mechanisms are possible and should be studied as well as well. For instance, social regulation can be taken into account in future studies, as well as studying the effects of AT on for example work and use of pharmacotherapy for anxiety.

Other hypotheses need to be formulated more firmly and narrower, before new RCTs are designed. Hypotheses can arise in general from expert experience, practice knowledge and scientific literature. Since scientific literature on AT is in its infancy, expert experiences and practice knowledge should be used to provide input for specific clinically relevant hypotheses.

Case studies are suitable for this aim (Driggers et al., 2016), because they can provide basic information on therapeutic processes, are aimed at explicating expert experience and give insight in the approach that is used in this intervention (www.care-statement.org). Case studies on AT may provide insight in the route along the improvements of executive functioning and stress level are accomplished, which may further substantiate the preliminary working mechanisms found in this study. In addition, case studies can be used to describe how positively tested interventions in RCTs can be tailored to the needs of the individual patient.

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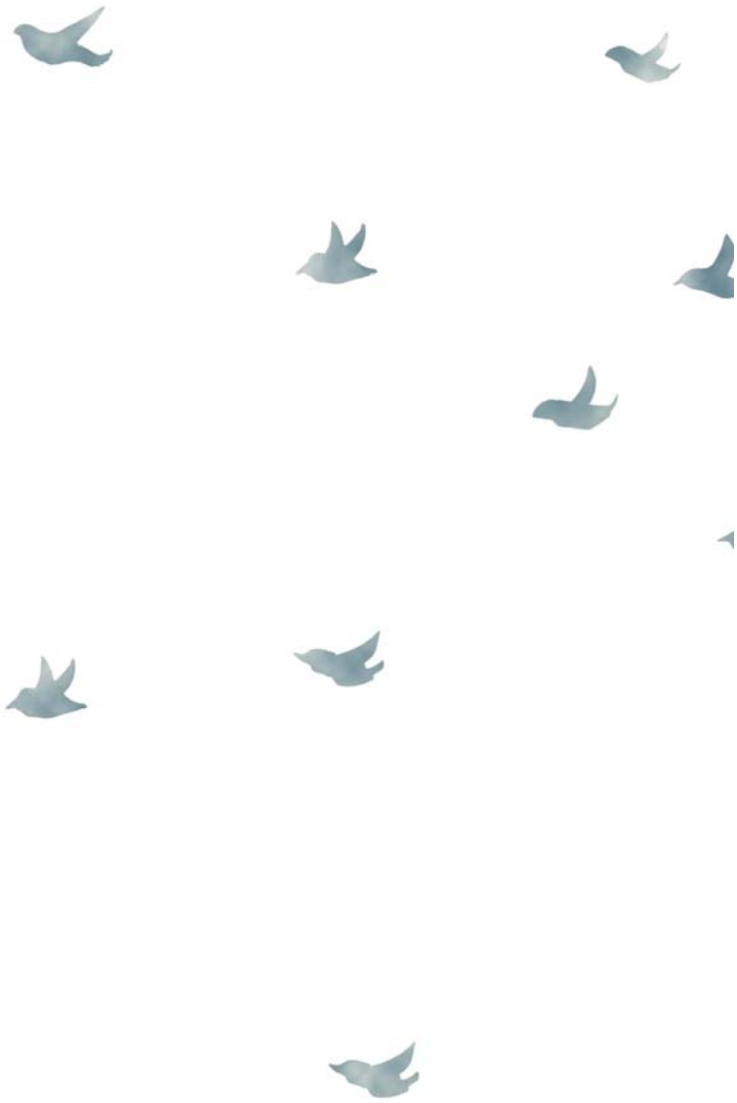
PART II

Towards further hypotheses on working mechanisms of anthroposophic art therapy: development of case report methodology

“The great thing is that the therapist somehow gave me the feeling, right from the start: you are more than your anxiety. I immediately felt that I could relax there, and that it would not matter if I could not relax.”
(Female participant, 32 years old)



Chapter 5

The CARE-AAT Guideline: Development and evaluation of a consensus-based guideline for Case Reports in Anthroposophic Art Therapy

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Abstract

Background: Anthroposophic art therapists (AATs) report individual cases in narratives of poor scientific quality. Good quality case reports are an important factor in the development of EBP. A guideline for scientific case reports could contribute to this. However, the recently published guideline for medical case reports (the CARE Guidelines, covering diagnosis, treatment and outcomes) is not completely suitable for AAT.

Objective: The development of a guideline for AAT case reports.

Methods: The CARE Guidelines were adjusted following the recommended steps for health reporting guidelines. The proposed adjustments are based on AAT literature and expert opinions. The face validity of the new CARE-AAT Guideline was judged by an international group of 35 AATs and three experts on case-study methodology.

Results: Seven items of the CARE Guidelines needed specification or addition. One item (Treatment objectives and plan) had to be added and six items could be used without change. The face validity of the new guideline is good.

Discussion: The CARE-AAT Guideline is suitable for scientific case reporting of AAT practice. It is assumed to be suitable for AT case reporting as well. Future use of the guideline will show whether further optimization of the guideline is needed.

Introduction

Anthroposophic Art Therapy

Anthroposophic art therapy (AAT), a specific type of art therapy (AT), is developed by Dr. Margarethe Hauschka in the beginning of the 20th century as a part of anthroposophic medicine (AM) (Hauschka, 2004). AM is an integrative diagnostic and therapeutic concept, developed from 1921 onwards and practiced today in over 60 countries. It combines conventional medicine with Rudolf Steiner's spiritual science (anthroposophy). AM considers a human being as a whole entity of body, mind, soul, and individuality. AM consists of different disciplines, such as anthroposophic medicinal products, massage therapy and art therapy, in a 'whole-system-approach' (IVAA, 2014) and is also characterized by its individualized support of the patient and his[1] development (Kienle, Kiene & Albonico, 2006).

The AAT approach is used by visual art therapists, music therapists and speech/drama therapists. It is primarily an individual therapy, used in somatic and mental healthcare. In this form of art therapy, an expressive approach is combined with an '*im*-pressive' or inwardly oriented approach. The client is at first guided to (sub- or unconsciously) express inner feelings and life experiences. The therapist then provides artistic exercises with the therapeutic aim of improving the health and resilience of the patient or client[2]. The exercises provide *impressions*: profound experiences of colour and shape, or tone and harmony. The concept is, that these impressions work 'medicinally' and activate the self-healing ability of the client (Christeller et al., 2000; Hauschka, 2004; Rolff & Gruber, 2015). The difference with the BAAT art therapy model is that the BAAT approach is closely allied to psychotherapy, uses visual art only and the artwork is not used as a diagnostic tool (http://www.baat.org/About-Art-Therapy).

Developing Practice-Based Evidence in AAT

For any intervention or therapy, the present reality is that its value can only become clear as the interventions and practice methods are transparent and increasingly evidence-based (Nijhuis, 2009). This applies to AAT as well. With regard to designing and executing scientific

[1] Where 'he' is written, 'she' can also be read.
[2] In AAT the term *client* is used instead of patient, in order to emphasize the equal relationship between therapist and patient.

research to study the effectiveness of AAT, there is much to gain. The AAT field needs to describe its practices more explicit, monitor its therapeutic processes, test its quality, safety and (cost) effects and present these data to relevant stakeholders (Baars & Koster, 2008).

In art therapy practice, most of the knowledge and expertise of art therapists is implicit (Smeijsters, 2007). Because the experience is not documented, this tacit knowledge is difficult to transfer and transparency about the therapeutic process cannot be provided. Valuable experience and expert knowledge are often lost because of this. This expert knowledge needs to be explicated, in order to become a valuable source of information for scientific research and education.

Expert knowledge of therapists can be derived from professional reflection on individual cases in so-called case reports. Van der Laan (2004) explains that case studies transmute tacit knowledge into explicit knowledge that can be shared, further developed and applied. This contributes to the development of practice-based evidence (PBE). PBE can serve as the basis of randomized controlled trials (RCTs), the golden standard for studying the effects of interventions.

The Advantages of Case Reports for Art Therapy Research

Case reports are increasingly recognized in medicine (Kienle, 2012) since 'information from case reports provide feedback on clinical practice guidelines and offer a framework for early signals of effectiveness, adverse events, and cost. They can be shared for medical, scientific, or educational purposes' (www.care-statement.org). In addition, they allow for describing clinical reasoning, individual decision-making and individual therapeutic effects (Kienle, Anderson, Baars, Hamre & Murphy, 2010; Vanderbrouke, 2001). Case studies leave the complexity of the therapeutic setting intact (Kienle et al, 2010) and can point out details that are difficult to catch in a RCT. For example, RCTs do not provide therapists with all details needed to benefit from experiences of colleagues (Huet & Springham, personal communication, Art Therapy Practice Research Network, April 2014). Therefore, case reports are an essential complementation for other types of research.

Normally in medicine, a treatment has been manufactured before and is generally available. But in art therapy, the intervention is not only based on external knowledge, but also on a creative process. The art therapist is part of the intervention: the professional attitude of the therapist influences the therapeutic process as well and the therapy is created within the

actual treatment session, based on knowledge of the personal characteristics and the life situation of the client. This can be captured by case reports.

To conclude: case reporting is a type of research that will provide a starting point for explicating knowledge and experiences of art therapists.

Quality of AAT Case Reports

Up to now, case reports about anthroposophic art therapy are published in books (e.g. Uitgeest, 2010; Ponstein, 2009; Uitgeest, 2016), anthroposophic journals (e.g., Der Merkurstab and the journal of the professional association of Dutch Anthroposophic Art Therapists (Reliëf)). There are no guidelines for these case reports and they are often a form of storytelling (e.g. Ratcliffe, 2015; Solheim, 2002a; Solheim, 2002b). This has the advantage that 'through storytelling, meaning is created and shared inside and outside the clinical setting' (Edwards, 1999). The disadvantage is that reflecting on a case (in retrospect) usually coincides several holes in the information gathered: for example the starting point of the therapeutic process is usually poorly documented and possible effects of the therapy are usually not visible because of a lack of repeated measures. This implies that the interpretation of the therapeutic process by the therapist is prone to subjectivity.

Within the current development of evidence-based medicine, medical science does not value stories, but demands good quality evidence, based on the application of good research methods (Kienle et al, 2010). The narrative case report needs to provide more (systematically gathered) information than usually provided by AATs. Therefore, it is important to improve the quality of case reports by developing reporting guidelines.

Aim of the Study

The aim of the present study was to develop a case report guideline for AAT. In 2013, the CARE (CAse REport) Guidelines, were developed (Gagnier et al, 2013) and accepted in medicine worldwide. These case report guidelines provide a scientific framework for publication of a transparent case report. However, these guidelines are developed for medical practice and cannot be applied directly to art therapy practice, including AAT practice. The guidelines require therapy-specific adjustments. Therefore we carried out a study that aimed at developing a case report guideline for AAT, based on the CARE Guidelines, AAT literature and AAT expertise.

Research Questions

In order to develop a case report guideline for AAT, we designed a study with the following research questions:

1. What are the specific adaptations (additions, specifications and modifications) that must be made to the CARE Guidelines, in order to be useful for publishing good quality case reports on anthroposophic art therapy?
2. What is the face validity of the case report guideline for AAT according to international AAT experts and methodologists?

Methods

The case report guidelines for AAT were developed according to the core items of the recommended steps for developing a health reporting guideline (Moher, Schulz, Simera & Altman, 2010), namely: (1) Initial steps (discussing the need for a guideline, extending of existing guideline, reviewing the literature, acquiring funding for the project), (2) Pre-meeting activities (identifying participants, Delphi method, preparing consensus meeting, preparing a list of items for consideration), (3) Consensus meeting (presenting pre-meeting activities, determining final version) and (4) Post-meeting activities (seeking and dealing with feedback and criticism, encouraging guideline endorsement).

For the development of the AAT case report guideline, the concrete activities within each of the steps, were:

1. Initial steps

1.a Discussing the need and purpose of the guideline

In several meetings with the Dutch professional association for anthroposophic art therapists (NVKT: www.kunstzinnigetherapie.nl), the educational program for AATs at the University of Applied Sciences Leiden, The Netherlands and the European Academy of AAT (in 2012 and 2014) the need for a guideline was discussed. A guideline was broadly seen as necessary for the improvement of case report quality. Hence, a research group (further referred to as the CARE-AAT Group; CAse REport Anthroposophic Art Therapy) was formed to execute this

specific task. The group consisted of three art therapists/researchers (two visual art therapists and one musical art therapist) and two experts in case-study methodology. During a kick-off meeting, the purpose of the guideline was discussed with the members of this research group.

1b Extending of existing guideline

The CARE Guidelines was selected as a basis, because this guideline was developed by a group of international scientists according to the highest standards of guideline development, comparable to for example the STROBE (for observational studies) ((http://www.strobe-statement.org/) and CONSORT (for randomized trials) guidelines (http://www.consort-statement.org/) and is accepted as a guideline for medical case reports.

The existing CARE Guidelines provides 13 items with definitions (www.care-statement.org). These items are: Title, Keywords, Abstract, Introduction, Client or Patient Information, Clinical Findings, Timeline, Diagnostic Assessment, Therapeutic Intervention, Follow-up and Outcomes, Discussion, Client or Patient Perspective, Informed Consent.

1c Item selection for the guideline

The existing CARE Guidelines were extended by means of items that were selected from the AAT literature and AAT expertise:

1. *Literature search:* by means of a literature review, items for case reports about AAT were collected. The searched databases were Pubmed/medline, Google Scholar, Arthedata and the database of Der Merkurstab. The following search terms were used: case report OR case study AND anthroposophic art therapy. The search was also performed in German and Dutch. In addition, the journal of the professional association of Dutch Anthroposophic Art Therapists (Reliëf) was searched for case reports. Articles were selected by the following criteria: reports are in Dutch, English or German; published after 2005; about a *single* case; only about anthroposophic art therapy (and no other therapies). Based on the assumption that an author uses the same standards and style for each care report, only the most recent case report per author was chosen. The selected case reports were read and the described items were extracted. Then, these items were categorized and finally compared to the CARE Guidelines.
2. *Explicating AAT expertise:* a survey, an online questionnaire, was held among all AATs registered at the Dutch Professional Association (NVKToag). AATs were asked what

information they routinely document. Based on this survey, documentation items were collected and clustered separately by two art therapists/ researchers (both member of the CARE-AAT group).

The selected case report items from the literature search and the survey were judged on quality, according to the concept mapping method (Nederlands Centrum Geestelijke Volksgezondheid, 1995): overlap with other items, ambiguity (an item has more than one meaning), singularity (an item is not a compound of more than one content), and concreteness (an item is specific, not vague or general). Then, the selected high-quality items were content-wise clustered by the same two art therapists/researchers that analysed the survey results.
After clustering the items were categorized according to four therapy phases: intake, diagnostic phase, therapeutic phase, and evaluation. As a result, a list of items per therapy phase was constructed.

2. Pre-meeting activities

2a Draft version

The list of items of the CARE Guidelines was extended with the acquired items, resulting in a first draft version of the AAT case report guideline.

2b Participants

The CARE-AAT group consisted of three art therapists/researchers and two experts on case-study methodology.

2c Delphi method

The CARE-AAT group performed a Delphi method to discuss the draft version, and discussed which items from the CARE Guidelines:

- could be applied directly to AAT cases;
- matched the CARE Guidelines items,
- required adjustments;
- were missing.

2d List items for consideration

The result of the Delphi method was a list of items for consideration, in preparation for the consensus meeting with other AAT experts.

3. The Consensus Meeting

During the consensus meeting with members of the CARE-AAT group, complemented with other expert AATs, all pre-meeting activities were presented, including the list of items for consideration. The final version was determined, following the method of the CODM Model (Hartnett, 2011) with a focus on open discussion and synthesizing a final proposal.

Ten expert AATs were invited for this meeting. They were selected by the following inclusion criteria: (1) educated as an AAT, (2) over five years working experience in clinical practice and/or AAT research or AAT teaching or in an executive function in AAT education.

4. Post-meeting Activities

Presenting the guideline and judgement of face validity

For the judgement of the face validity of the constructed guideline, expert AATs (different from the AATs that participated in the consensus meeting) were selected by the following inclusion criteria: minimum of five years experience with AAT research or AAT teaching or with an executive function in AAT education.

During the annual meeting (January 2015) of the European Academy for AAT in Dornach, Switzerland, all present AAT experts that fulfilled the inclusion criteria were asked to answer two questions about the case report guideline: Do the items cover all necessary information, needed for a case report on AAT? Can the case report guideline provide a framework for good quality case reports on AAT?

Three experts on case study methodology and AM research were separately asked to provide their professional opinion about the case report guideline and the methodology of the development of this guideline.

Results

1a Kick-off meeting: discussion of the purpose of the guideline

The CARE-AAT group stated that the guideline should improve the quality of case reports in the light of education (transferability of experience) and from a scientific point of view (publishing about AAT and executing the first steps in demonstrating effects).

1b Existing guideline

The existing CARE Guidelines (www.care-statement.org) with 13 items were used as a starting document.

1c Item selection

i Literature review

The results of the review of the literature in the databases: Pubmed contained three results, but none of these matched the inclusion criteria; Google Scholar: no matching results (only cohort studies or conventional art therapy); Der Merkurstab: one matching item (Hamre, Glockman & Kiene, 2004); Arthedata: no papers in peer reviewed journals, only book contributions.

Criteria for case reports were discussed in the book on scientific foundations of (anthroposophic) art therapy (Sinapius & Ganss, 2007). These criteria contain a list of items that should be included in a therapeutical oncological single case report (Kienle, 2007). These criteria are not directly applicable for AAT or diseases other than cancer.

From the journal Reliëf, five case reports were selected. Complemented with a book, six case reports matched the criteria and were selected (Gooijer – du Buf, 2008; Farshi & Rümke, 2009; Pels, 2010; Ponstein, 2009; Twisk, 2009; Uitgeest, 2010).

All described parts in these case reports were compared and categorized. These case reports describe all together items in 18 different categories: Title, Abstract, Introduction, Client history, Diagnostics, Indication, Treatment request, Treatment goals, Contra indications, Course of treatment, Interventions, Therapist attitude, Results/conclusion, Methods/material, Duration of the therapy, Evaluation of the treatment, Clients consent,

Visual material. The case reports differed with respect to the number of the above items that were covered.

A comparison with the CARE Guidelines, showed that the following items are missing in these case reports: (*routine) outcome measures* (except for Ponstein (2009)), and/or *client experiences*; the *use of (scientific) literature* to substantiated the treatment plan; *patient perspective* on the results of the therapy and *follow up information*. An important finding was, that effects and results are mostly descriptive and from therapist point of view. However, the use of outcome measures is desirable from EBP perspective.

Because we expected to find more AAT case reports, we strongly believe that there are more case reports published, but these were not found with the used search words. We encountered the following problems in finding case reports: first, the word 'case report' is not present in the title, which makes case reports on AAT hard to find. Second, case reports are often not solely about AAT, but about a combination of therapies. These findings prompted us to follow the CARE Guidelines in explicitly stating the words 'case report' in the title.

ii Survey

Of the 350 registered AATs, 77 completed the online survey (22%). These therapists provided 1,162 entries for documentation of the therapeutic process.

Item selection for the case report guideline

The 1,162 entries from the survey were put in an Excel sheet. After a process of concept mapping, a final list of 113 items was constructed based on consensus building between the two art therapists/researchers. These items were content-wise clustered into a small group of 11 items with description.

Second, these AAT items were placed under nine of the in total 13 items of the CARE Guidelines by the two researchers. (Table I, the right column, in regular font (not bold)).

2.a-d Draft version

This list was discussed in a Delphi method process, to form the draft version of the CARE-AAT Guideline. There were three participants in this process.

The draft version of the CARE-AAT Guideline was presented to the other members of the CARE-AAT group and they were asked to provide their additions. The following specifications and additions were made:

- Introduction: use of *literature* was specified because AATs need to link their professional insights to explanation models from scientific literature and established evidence, to explain their professional practice. This contributes to providing mechanistic evidence of AAT. The use of literature needs more attention, since AATs tend not to use literature to underpin the treatment goals/plan in their case reports, according to the results from the foregoing survey and literature search.
- Client or patient information: *biographical history* (e.g. childhood, life events, diseases, crises) was added, because this is an important part of the diagnostic information in AM, based on the assumption that i.e. diseases and crises may have a place and meaning in the life course of an individual (Heusser, Scheffer, Neumann, Tauschel & Edelhaüser, 2012).
- The *client's treatment request* is an important issue in AAT. In AM, clients are given and (many) want to take responsibility for their healing process (Kienle et al., 2006) and from that perspective they are asked what treatment needs they have: what problems are they facing, on which issues do they want to work on and/or what would they want to develop? A side note must be made: for mentally disabled patients, small children or dementia patients, this item is not applicable.
- Clinical findings: *outcome measures* were specified for this item, because in AAT case reports, effects and results are usually only descriptive in nature and only judged by the therapist, hence principally subjective from a scientific point of view. From the literature review and survey, we concluded that in practice, AATs do not routinely use measuring instruments to monitor effects of the therapy. However, from a scientific point of view, this is necessary.
- Diagnostic assessment: this was modified according to the general procedure of AAT, that is built up from *observations* of the client (on the appearance, the behaviour/attitude and the way of working) and a *medium specific diagnosis.* This diagnosis is made on the free work that the client makes during the first session(s). The therapist observes the features of the artwork and gives meaning to these features and

the total art work, following a four step method, based on Goethe's phenomenological science (Bie, van der, 2012; Uitgeest, 2010; Verhoogh, 2006).

- Therapeutic Intervention: this item was substantially expanded. In the CARE Guidelines, it is sufficient to only mention the choice of treatment, since the users (medical doctors) don't have to underpin or substantiate this choice, because working mechanisms, effects and side effects are, generally speaking, already explicated, studied and published. This is not the case with AAT, where scientific research explaining and proofing the rationale of the non-verbal therapy is commonly lacking. Therefore, the *intervention* (exercises and adjustments given during therapy and therapeutic attitude) should be well described and substantiated in the AAT case report guideline.
- Also, *consultation with others* was added to this item. Because this can provide extra information about the client and may lead to changes in the treatment approach or intervention. The same applies to *reflection* and *evaluation during the course of treatment*. These can lead to changes in the approach and substantiate these choices.
- Follow-up and Outcomes: the use of *outcome measures* was specified for this item, because in AAT cases, as mentioned earlier, effects and results are usually only descriptive and from the therapist point of view.
- Also *patient perspective on the evaluation* is included here. Usually, an evaluation between patient and therapist is held at the end of the therapy process. There is no standardized form for this evaluation, notes are not always made and it is not clear whether patients can provide their opinions freely.
- Discussion: the use of *literature* was specified because AATs don't often use literature in case reports.

With the above information, the first version of the AAT case report guideline was created, with the working title 'CARE-AAT Guideline' (CAse REport Anthroposophic Art Therapy Guideline).

3. Consensus meeting

The first version of the CARE-AAT Guideline was discussed in a consensus meeting. In addition to the CARE-AAT group, three other experts participated (two art therapists/researchers, one

Dutch and one German, and one epidemiologist). The list was discussed per item during this meeting, after which full consensus was achieved.

One item was added as a separate item: *Treatment Objectives and Plan*. Experts stated that this should be a separate item, because this is an important step in the art therapy process that precedes the Therapeutic Intervention.

The additions to Therapeutic Intervention were found to be too extensive and were shortened. Nevertheless, all experts agreed that the intervention should be well described and substantiated. *The underpinning of the treatment plan* was found an important addition, because in case reports, AATs do not make clear why they choose a specific treatment direction and where these choices are based on.

Therapist self-reflection (e.g., observations of own actions and own attitude, reflection on the interaction with the client, intuitive moments) was not present in the draft version of the guideline. Since it is an important item in AAT practice, the expert group suggested this to be incorporated in the CARE-AAT guideline. Reflection is done after each session and also on the therapeutic process as a whole. The therapeutic relationship is an important factor in healthcare (Born, 2006). Reflection on these aspects is essential in the ongoing professionalization of the therapist. It is important to include the reflection item in this guideline, because this can provide more insight in the clinical reasoning of the therapist, in the decision moments and the way AATs work. This can provide explicit information about the therapy. The therapist's self-reflection was classified under the item Discussion, because in this item, one can reflect on the case and can point out strengths and weaknesses of professional intervention.

The items that remained unchanged are: Title, Keywords, Abstract, Timeline, Client or Patient Perspective and Informed Consent (Table I).

Final version

After the changes made during the meeting, the CARE-AAT Guideline was accepted with minor revisions, through e-mail contact with the participants of the consensus meeting. The CARE-AAT Guideline is presented in Table I.

Table I. CARE Guidelines Items and AAT Specific Adaptations: CARE-AAT Guideline

CARE ITEM	CARE GUIDELINESS SECTION DESCRIPTION	ANTHROPOSOPHIC ART THERAPY SPECIFIC ADAPTATION*
TITLE	The words case report (or case study) should appear in the title along with phenomenon of greatest interest (e.g., symptom, diagnosis, test, intervention)	No change
KEYWORDS	The key elements of this case in 2 to 5 words	No change
ABSTRACT	1) Introduction—What is unique about this case? What does it add to the literature? Why is this important? 2) Case Presentation: a. main symptoms of the patient and main clinical findings b. main diagnoses, interventions and outcomes 3) Conclusion—What were the main takeaway lessons from this case?	No change
INTRODUCTION	One or two paragraphs summarizing why this case is unique with reference to the relevant medical literature	Specify: **Literature (profession specific (AAT as well as AT), disease/condition specific, research on natural course, other treatments and side effects)**
CLIENT OR PATIENT INFORMATION	Include all of the following details about the client/patient: 1) Demographic information (e.g., age, gender, ethnicity, occupation) 2) Main symptoms and concerns of the patient 3) Medical, family, and psychosocial history—including diet, lifestyle, and genetic information whenever possible and details about relevant comorbidities including past interventions and their outcomes	3) Add: - Clients treatment request - Short biographical description 4) Referral data (if applicable): - Position of the referrer - Referral question and/or therapy objective
CLINICAL FINDINGS	Describe the relevant physical examination and other significant clinical findings	Modify: **Describe physical and psychological state of health, preferably based on results from a generic questionnaire.** **Describe specific characteristics of the condition, if possible by a classification system (DSM, ICD, ICF,…) and/or based on results from a specific questionnaire (aimed at the specific condition of the patient).**
TIMELINE	Relevant data from the patient's history organized as a timeline	No change

DIAGNOSTIC ASSESSMENT	Diagnostic methods (e.g., PE, laboratory testing, imaging, questionnaires) Diagnostic challenges (e.g., financial, language/cultural) Diagnostic reasoning including other diagnoses considered Prognostic characteristics (e.g., staging) where applicable	Modify: Diagnostic Assessment: - Observation of the client, attitude, way of working and the art works - Medium specific diagnosis
ADD: TREATMENT OBJECTIVES AND PLAN		Treatment goals / objectives: - Main objective (general) - Sub-objectives (behavioural and medium specific) Treatment plan: - Treatment direction, phases and themes (if applicable) - Medium specific (material, techniques) - Therapist attitude - **Reasoning/rationale for the above** **Evaluation plan:** - **Observation criteria (core observations for this specific patient in this case)** - **Evaluation criteria**
THERAPEUTIC INTERVENTION	Types of intervention (eg, pharmacologic, surgical, preventive, self-care) Administration of intervention (eg, dosage, strength, duration) Changes in intervention (with rationale)	Each session: - Artistic exercises (medium and technique), with rationale - Therapists attitude, with reasoning - Observations: on the execution / way of working of the client / on the art work / and related to observation criteria, including pictures of the art works - Interventions and reactions on interventions - **Reflection on the session** - **Other remarkable events** Add: **Consultation with others (reasons and conclusions)** (if applicable) Add: Evaluation during the course of treatment: - Therapist reflection on the therapeutic process (changes in symptoms, behaviour and art work). - Clients opinion and client-assessed outcomes - **Adjustment of the therapy, with specification and reasoning**
FOLLOW-UP AND OUTCOMES	Summarize the clinical course of all follow-up visits, including	Specify:

	• Clinician- and patient-assessed outcomes Important follow-up test results (positive or negative) • Intervention adherence and tolerability (and how this was assessed) • Adverse and unanticipated events	• **Results (quantitative/measurable): questionnaires or other measurement instruments** • Results (descriptive): evaluation of the effects: – judgement by the therapist (summarize the developments in art work, behaviour and social interaction) – judgement by the client – **judgement by third parties (parents, family, partner, co-treating professionals and/or referrer)** <u>Add:</u> • Conclusions • Comparison of the conclusions with the main therapy objectives.
DISCUSSION	Strengths and limitations of the management of this case Relevant medical literature Rationale for conclusions (including assessments of cause and effect) Main takeaway lessons of this case report.	<u>Add:</u> reflection on own acts, therapeutic relationship, interaction with the client and intuitive moments. <u>Specify:</u> **Literature (profession specific (AAT as well as AT), disease/condition specific, research on natural course, other treatments and side effects)**
CLIENT OR PATIENT PERSPECTIVE	The patient should share his or her perspective or experience whenever possible.	<u>No change</u>
INFORMED CONSENT	Did the patient give informed consent? Please provide if requested	<u>No change</u>

*__In bold font:__ items *not* mentioned by AATs

4. Post-Meeting Activities

Face validity of the CARE-AAT guideline

During the annual meeting of the European Academy of AAT in January 2015, the AATs present participated in a discussion about the quality of the CARE-AAT Guideline. The guideline was presented and the 35 included AATs (visual, musical and speech art therapists, from different working areas and all involved in AAT education) were asked questions about the CARE-AAT Guideline (covering all necessary information, needed for a case report on AAT; adequacy as

a framework for good quality case reports on AAT). All experts responded positively to the two questions.

There were two remarks: first, the AAT experts doubted if AATs would be able to provide all necessary information for a case report according to this guideline. Not all items are momentarily well documented in practice by AATs. Therapists indicated that they need more support with obtaining the necessary information for writing a case report. This requires detailed instructions.

Second, AATs indicated that some might not be possible to be addressed in all working areas of art therapists (e.g. intellectual disabled clients might not be able to mention their own treatment request, or demented elderly might not be able to fill in a questionnaire or provide their opinion about the therapy progress). Hence, it was strengthened that the guideline reflects the ideal situation and alterations, if explained, to the suggested data collection can be made.

Endorsement

Since the guideline is developed with and judged by representatives from international AAT schools, the guideline is already endorsed by AAT education throughout Europe. The CARE-AAT group encourages AAT schools to educate students in the use of the guideline.

Conclusions

Based on the results of the study the following conclusions can be drawn:

1. For the development of a case report guideline for AAT, specific adaptations (additions, specifications and modifications) were made to seven of the thirteen items of the CARE Guidelines (see Table I). The adaptations concern the items: Introduction, Client or patient information, Clinical findings, Diagnostic assessment, Therapeutic Intervention, Follow-up and Outcomes, Discussion. One item was added, because it did not fit in one of the CARE Guidelines items: Treatment Objectives and Plan. Six items remained unchanged: Title, Keywords, Abstract, Timeline, Client or Patient Perspective and Informed Consent.

2. The face validity of the CARE-AAT guideline is good according to a group of 35 international expert AATs and methodologists. The guideline covers all necessary information, needed for a case report about AAT. However, the guideline might not be used in all domains of art therapists (e.g., in the treatment of intellectual disabled or demented clients).

Discussion

The demand for evidence in art therapy is not easily met as anthroposophic art therapists (AAT) report individual cases in narratives of poor scientific quality. In this study, a guideline for case reports by anthroposophic art therapists (AATs) was developed and tested on face validity. The CARE Guidelines, for the medical profession, were successfully adapted for AAT. The developed guideline (Table I) was positively judged on face validity by experienced international AATs and methodologists.

The importance of the CARE-AAT Guideline for AAT practice is that therapists can use it for scientific publication of individual therapy processes, and by doing that, contribute to education (Ponstein, 2009), professionalization and building the body of evidence of AAT. The guideline provides the scientific instrument to design and conduct case studies in the field of AAT. The case reports that will be published according to the guideline, can provide an insight into best practices and serve as a fundament for clinical trials. Finally, the results of the study can contribute to the development of case-report guidelines for other paramedical professions.

A limitation of the study is that it focuses on AAT only. Although the problems, mentioned in the introduction, pertain to both art therapy (AT) and the AAT field, for the sake of the viability and because all researchers had an AM/AAT background, we restricted ourselves in the study to the field of AAT. The research group is of the opinion that many of the adaptations are applicable to art therapy in general and that the guideline can be used in the art therapy field with limited adjustments. Because the guideline is not medium specific, and is judged by AATs from all different media, it can be used by visual art therapists, as well as music therapists and speech/drama therapists.

The development of the case report guideline is not completed yet. The CARE-AAT Guideline describes how a case report should be written and published, but prior to this, an art therapist needs to provide the right input: complete and good quality information. The therapists indicated that for this, more guidance is needed, preferably by means of a documentation method. The CARE-AAT group is currently developing a documentation format that can be used for collecting the data for a prospective case study. This documentation format (CARE-AAT Documentation Method) is created for facilitating case reporting and will be content-wise in line with the case report guideline. In this format, the items that should be documented, will be described in chronological order. This can support the therapist to track daily AAT practice (diagnosis, treatment plan, interventions, outcomes) in a structured manner. To generate client-assessed outcomes, therapists can use a monitoring tool, e.g. a client questionnaire can generate basic information about the (client experienced) effects of art therapy. This will also be included in the documentation method.

Future research will focus on the use of the CARE-AAT Guideline and Documentation Method in clinical practice in three countries (the Netherlands, the UK and Germany) and the testing of its usability and validity in clinical practice, in art therapy education and in scientific case studies. We will assess whether the guideline has helped to improve the quality of case reports. Finally, the CARE-AAT Guideline and documentation method will be optimized, based on testing and users' experiences.

A logical next step for conventional art therapy (as provided by BAAT therapists) could be to test and discuss the guideline in AT practice.

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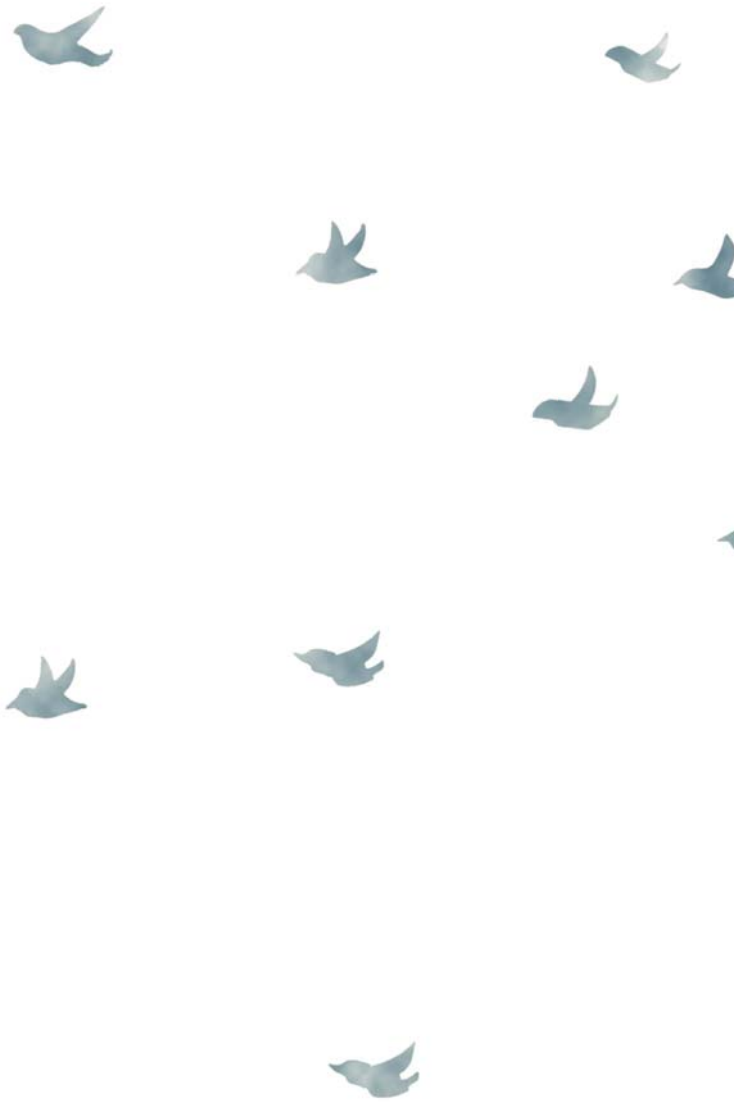
“I encountered my fear. I am often still very anxious, but I have less problems with it. I let it come and it goes again”

(Female participany, 54 years old)



Chapter 6

Acceptance of anxiety through art therapy. A case report exploring how art therapy addresses emotion regulation and executive functioning

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Abstract

Anxiety is a major problem for many individuals, causing impairment in daily life. Art therapy is often deployed and although positive results are communicated in clinical practice, its effectiveness and working mechanisms have hardly been studied. Therefore, it is important to systematically describe the intervention process, to detect the working mechanisms to be able to evaluate them. Narrative case studies help to understand the intervention in more depth.

A typical case file was selected for case reporting according to scientific (CARE & CARE-AAT) guidelines, with the aim to explore the therapeutic elements that contributed to the reduction of anxiety. The report describes the intervention process of a 54-year-old female, suffering from anxiety since childhood and diagnosed with panic disorder, agoraphobia, claustrophobia and hypochondria.

After 14 sessions of anthroposophic art therapy, reduction of anxiety was shown, as well as improvements of emotion regulation and executive functioning. The client indicated that she became more tolerant and accepting towards her anxiety. She noted a softened attitude towards herself and her complaints, even one year after art therapy.

The course of treatment suggests that aspects of emotion regulation and executive functioning were addressed through implicit learning processes in different art therapy assignments.

Introduction

Anxiety disorders are one of the most common mental problems in the world (World Health Organization, 2018) and are characterized by convulsive patterns of taking and keeping control over life situations, for instance, avoidance of potentially fearful situations. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) distinguishes different types of anxiety disorders. The most common anxiety disorders are phobias, social anxiety disorders, generalized anxiety disorders and panic disorders (Anxiety and Depression Association of America [ADAA], 2018). People with a panic disorder experience recurrent and unexpected panic attacks, which can occur unexpectedly or can be brought on by a trigger, such as a feared object or situation. Panic attacks, the worry about panic attacks and the effort to avoid attacks, by avoiding places, situations or behaviours, cause significant problems in various areas of a person's life. It may e.g. include the development of agoraphobia: fear for situations outside the home, where leaving might be difficult or impossible (ADAA, 2018).

Spontaneous recovery of anxiety disorders is rare (Van Balkom et al. 2001). However, patients may benefit from treatment. Frequently provided and well-studied interventions are pharmacotherapy (PT) and Cognitive Behavioural Therapy (CBT). CBT aims to change maladaptive beliefs about the probability and magnitude of the anticipated harms by using behavioural (exposure) and various cognitive (e.g. altering dysfunctional thoughts) techniques (Hofmann & Smits, 2008; Smits, Julian, Rosenfield, & Powers, 2012). Despite the proven effectiveness of PT and CBT (Hooke & Page, 2006; Pohl, Feltner, Fieve & Pande, 2005; Hofmann & Smits, 2008; Kjenisted & Bleau, 2004), an estimated 30%–60% of patients do not benefit from these interventions and continue to suffer from anxiety after treatment (Heldt, et al. 2003; Tyrer, Seivewright & Johnson, 2004; Linden, Zubraegel, Baer, Franke & Schlattmann, 2005; Zou, Ding, Flaherty & Dong, 2013; Pelissolo, 2008; Katzman et al., 2014). Additionally, some people don't want to choose these types of interventions. Therefore, other interventions are deployed. One of these interventions is art therapy (AT). AT uses visual art exercises to elicit experiences and new insights and beliefs, with the aim to stimulate personal development and improve mental health (BAAT, 2019). AT has several variants, of which anthroposophic art therapy (AAT) is one. Anthroposophic art therapists work from a specific

holistic vision on the human (Kienle, Albonico, Baars, Hamre, Zimmermann, & Kiene, 2013). The central point in this approach is that the therapist does not focus on the primary symptoms of a person, but considers the individual as a whole of physical, psycho-social and biographical aspects. The therapy is aimed at gaining insight into the processes underlying the primary symptoms and aims to initiate a holistic healing process in which the client is enabled to actively work on his or her wellbeing, including the reduction of primary symptoms.

A common view is that people with anxiety are overwhelmed by their emotions because they cannot neutralize the emotions with helpful thoughts and because the mind is in a hyper-alert state (Beck & Haigh, 2014). Worry and rumination are often present in individuals with anxiety (APA, 2013), which anthroposophic art therapists characterize as 'a dominance of excessive and unproductive thinking', which should be reduced in therapy. According to Borkovec (1994) (as cited in Dar & Iqbal, 2014), worrying and verbal activity interferes emotional processing and prevents adaptive coping in individuals with anxiety.

An explicit goal of AAT is that the anxiety is not 'consciously' or cognitively addressed as this will keep patients in their 'thinking-mode', enabling worry and rumination. This gives rise to the hypothesis that AAT, applied through specific art assignments, may work via an 'unconscious', implicit route, aiming for the profound experience of e.g. colour, atmosphere, shape and dynamics. These experiences are referred to as 'impressions' in AAT and are believed to improve the self-regulating ability of the client (Christeller et al., 2000; Hauschka, 2004; Rolff & Gruber, 2015).

Although AAT is used in Western society and often clinically positively evaluated, hardly any research has been conducted into its mode of action. To date, one RCT on the effectiveness of AAT in women with anxiety disorders has been performed. The results are promising and show a significant reduction in level of experienced anxiety, compared to a waiting list condition (Abbing, Baars, De Sonneville, Ponstein & Swaab, 2019). From this study possible working mechanisms emerged: AAT may act through improvements in emotion regulation (strategies) and through improvement of executive functioning in daily behaviour.

To gain more insight in the AAT therapeutic process leading to the reduction of experience of anxiety and supposed improved emotion regulation and executive functioning, a case of a 54-old female is described in detail. The aim was to describe the AAT therapeutic elements, explore possible connections between these elements and improvements of emotion regulation and executive functioning. The CARE-AAT Guideline (Abbing, Ponstein, Hoekman,

Gruber & Baars, 2016), which is the CARE Guideline (Gagnier et al., 2013) with additional categories for AAT, was used for reporting. The case description is based on a case file filled by the therapist according to a CARE-AAT documentation method (Abbing, Ponstein, Hoekman, Van Hooren & Baars, 2018). This information was supplemented with information from interviews with the therapist aiming for substantiation of certain choices that were made during the process. The client was interviewed twice as well, first about four months after therapy and again one year later. With open questions she was asked to report on her experiences with the therapy, the exercises, the therapist, the process and possible changes that she experienced in health, wellbeing and daily life. Information that was gathered after the process is given in the case presentation in italics and between brackets. Information meant to give background information and or insight in the reasoning of the therapist is presented in italics.

The client agreed to participate in the anonymized description of her treatment. She signed an informed consent to approve of the collection of information during art therapy and approved of description and publication of this article.

Case Presentation

Client information

The case concerns a 54-year-old Dutch woman (referred to as Dewi[3]). Dewi is highly educated and works as an official at a municipality in the Netherlands. She lives together with her husband and their two children. She is neat and punctual (in clothing and time).

Dewi experienced a stressful period in her life around the age of five or six, when she was locked on purpose in a small room several times. In her early twenties, she experienced a panic attack in a train which quickly developed into fear of being trapped. This gradually expanded from just fear for trains, to fear of driving a car, fear of elevators and fear of walking alone outside and losing her orientation. She actively tried to cope with her anxiety by allowing herself a time out, using only slow trains (to be able to get out sooner), and asking somebody to accompany her while she was driving a car. A few years after the onset of the anxiety

[3] Dewi is a fictitious name.

symptoms, Dewi received rational emotive therapy which did not result in improvement, to her opinion.

Over the last 15 years, she also developed fear for becoming ill and not being able to care for her children. Four years ago, she received another treatment for her anxiety, psychotherapy wiith EMDR (Table I, timeline). In her vision, this resulted in more insight in the cause of her anxiety but did not reduce her anxiety symptoms.

On voluntarily application for AAT Dewi suffered from anxiety, which she characterizes as claustrophobia (especially in trains, cars and elevators), tension (distress) and hypochondria. She was looking for relief of these complaints, but had no specific expectations of the therapy.

Table I. Timeline of symptoms and previous treatments

Age	Symptoms and treatments
5/6	Anxious experiences in childhood (being frequently locked-up in a closet).
21 and beyond	Onset of panic attacks on the train, gradually increasing (only taking slow trains), expanding to fear of elevators (avoiding elevators), fear of driving (avoiding driving alone) and walking alone outside (fear of losing orientation and being lost).
23	Rational emotive therapy; no decrease of anxiety symptoms.
38 and beyond	Increase of symptoms after the birth of her children. Also, developing fear for becoming ill and not being able to care for her children.
50	Psychotherapy with EMDR: some improvements (more comprehension of the cause of the anxiety); no decrease of anxiety symptoms.
53	Applying for AAT with the following symptoms: panic attacks (fear of being locked-up and fear of losing orientation), claustrophobia and hypochondria.

Clinical findings and Diagnostic assessment

Symptoms of psychopathology were assessed prior to AAT using the Dutch version of the rater-administered Mini International Neuropsychiatric Interview Plus (MINI-Plus) (Van Vliet, Leroy & van Meegen, 2000). Based on these ratings Dewi met the criteria for panic disorder with agoraphobia and claustrophobia. She also had symptoms of hypochondria, but did not meet the criteria for this classification according to the MINI-Plus.

The Dutch versions of the Lehrer Woolfolk Anxiety Symptom Questionnaire (LWASQ; Lehrer & Woolfolk, 1983; Scholing & Emmelkamp, 1992), the MANchester Short Assessment of QoL (MANSA; Priebe, Huxley, Knight & Evans, 1999; Van Nieuwenhuizen, Schene & Koeter, 2000), the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) and the Behavior Rating Inventory of Executive Function for Adults (BRIEF-A; Roth, Isquith, & Gioia, 2005; Scholte & Noens, 2011) were used to assess Dewi's psychological functioning at the onset of

AAT (Table II). The scores showed high levels of anxiety symptoms (LWASQ) and high levels of difficulties with emotion regulation (DERS). Her quality of life (MANSA) was moderate and her problems in daily executive functioning (BRIEF-A) were in the clinical range; perceived behaviour regulation was in the subclinical range and metacognition was high in the clinical range.

None of these findings were shared with the art therapist as to not to interfere with the usual therapeutic process, which is usually without formal assessment of psychological functioning with questionnaires. The therapist only knew the three main complaints that Dewi shared with her: anxiety, tension and hypochondria. During the treatment the impact of these complaints was scored every week at the start of each therapy session by the client by the use of a visual analogue scale (VAS) (Davey, Barratt, Butow & Deeks, 2007, Figure 14).

Treatment plan

Dewi received 14 AAT sessions in total, of which one was an intake session at the beginning and one was the evaluation session at the end. The weekly sessions took place during a six month period and were approximately 1 hour in length each. Due to summer holidays AAT was temporarily discontinued for 8 weeks. The sessions are described in more detail below. Dewi was not treated with medication or any other form of therapy during AAT.

Treatment goals

The first session was aimed at the collection of personal and medium specific information. The first half of the session involved an intake, in which the therapist verbally assessed symptoms and medical, family, and psychosocial history, in order to gain comprehension of client's symptoms and background. This was followed by the making of a 'free painting', for diagnostic purposes (Huber, van der Elst and Riezebos, 2003, Verhoog, 2006). For the diagnostic painting the aquarelle painting technique (wet paint on dry paper) was used. The therapist presented ready to use suspensions of primary colours (red, yellow and blue) in water. Dewi was given complete freedom to paint, without any instructions. She painted quietly and attentively.

*Image 1. Free aquarelle painting***.** This painting served as the starting point for therapy.

The painting (Image 1) shows precisely and carefully placed stripes. The therapist, based on her education and experience, interpreted this as a 'controlled way of painting'. The controlled way of painting may indicate a dominance of 'thinking' or a hyper-alert cognitive approach to the art work, which is often seen in anxious people (Rümke, 2011; Beck & Haigh, 2014). *[Dewi experienced the assignment as too free and with little structure, which made her feel uncomfortable and a bit insecure about how to make the painting.]* Although Dewi worked in silence, the therapist noticed that the assignment made Dewi a little uncomfortable and decided to provide another exercise, as some session time was left.

For the second exercise, the therapist wanted to provide Dewi with a less control provoking technique and chose a more sensory exercise. She decided to use clay, because of the tactile sense that is addressed in clay work. Dewi had modelled busts and abstract forms before and was more familiar with clay. Now more precise instructions (to mould a sphere, Image 2) were presented. She enjoyed modelled the sphere and indicated that she preferred clay modelling to painting.

Image 2. Clay modelling of a sphere.

Based on the intake and the diagnostic painting (Image 1), the therapist concluded that hyper-alert cognitive schemas probably predominated in Dewi.

Dewi's symptoms indicated that the relation and interaction with the outside world is a source of distress (claustrophobia and agoraphobia). *Developing a realistic perception of the outside world and positive relationship with it, is an important treatment goal in AAT. Hyper-alert cognitive schemas are often present in individuals with anxiety, and hyper-alertness is related to high levels of arousal (Beck & Haigh, 2014). Anxious people often experience high levels of emotional intensity (Mennin, Heimberg, Turk & Fresco, 2005). The view in AAT is that this intensity can be addressed by learning to observe the outside world more objectively by visual and tactile methods. The physiological hyperarousal, that is associated with anxiety (Clark and Watson, 1991), is addressed in AAT by working on relaxation. Next to physiological hyperarousal, anxiety can be characterized by negative affect (Clark and Watson, 1991). People with high levels of negative affect tend to focus on the unpleasant aspects of themselves and the world, have negative expectations of the future and of other people (Watson & Clark, 1984; Jeronimus, Riese, Sanderman & Ormel, 2014).*

Based on the foregoing, the therapist set the following specific treatment goals for AAT:

(1) enhancing (inner) relaxation;
(2) releasing control mode and hyper-alert cognitive schemas;
(3) connecting to feelings;

(4) improving the objective observation of the outside world; and

(5) enhancing the (positive) interaction with the outside world.

Treatment plan

The therapist, based on her experience and observation of Dewi, anticipated that Dewi would be able to perform relatively simple and explicitly outlined art assignments without facing too much difficulty. Especially when known material (clay in this case) was used. In this way Dewi would be able to develop appreciative feelings towards AAT and would have time to positively relate to the therapist and would sooner be able to find relaxation.

Then, the therapist planned to put more emphasis onto treatment goals 2 and 4. The therapist chose to use charcoal for this purpose. *This material is natural in origin and is not suitable for work in much detail (which is believed to stimulate loosening of the 'control mode') and allows for various techniques that can be used to draw to the observation. With charcoal, it is also possible to explore the world of greys, which allows for the inner experience (impression) of grades of light and dark as opposed to the less nuanced mental judgement that anxious people generally have towards themselves, the anxiety symptoms and the outside world (negative affect) (Mees-Christeller, 1997).*

In the final phase of the therapeutic process, the therapist planned to bridge the return to a colorful daily life and to enhance positive interactions with the outside world. For this aim, soft pastels were used, *which allow for experiencing colour and a tactile experience of softness and warmth, because the chalk pastel is whipped out on the paper with the use of the fingers.*

Finally, the therapist wanted to exploit an encouraging and supporting therapeutic attitude. Being open for questions and actively interested in thoughts and feelings of Dewi during therapy but not aiming for the direct expression of emotions, nor for confrontation. The therapist would exploit a silent presence during the art sessions, in order to create circumstances in which Dewi could experiment, practice and experience. Too much talking can stand in the way of experiencing.

Explanations with respect to the choice of material and assignments were not given to Dewi as the therapist wanted to avoid Dewi to become hyper-alert and take conscious control over the therapeutic process. Thus, the therapist replied to Dewi's questions about this matter in terms of: 'this will become clear in a later phase' or 'the experience is more important than

the explanation'. Thus, the explanations given below are solely meant to enhance the understanding of the case and do not reflect conversation with Dewi at the time.

Therapeutic intervention

In the *second session*, again a sphere was modelled (image not shown). This served as a comforting assignment to Dewi as she had done this before. Next, Dewi was invited to transform the sphere into a different form. Emphasis was put on enjoying and experiencing the modelling process rather than aiming for a specific clay form. She was asked to hold the sphere in her left hand whilst gently transforming it with her right hand and modelling the clay near to the location of her heart. *In this way you cannot see what you are doing and you are mainly dependent on touch/ tactile senses. This is believed to prevent excessive mental control over the modelling process* (Hoefsloot, 2007).

At the end of the session, the modelled form was drawn to the observation . Charcoal was used and the emphasis was given to the correct representation of the form, not in detail but in terms of proportions and shades of light and dark. *The aim of this exercise was to invite Dewi to release some hyper-alertness by concentrating on the correct observation in an unfamiliar manner: not looking at details and not using own cognitions (drawing what you think), but looking at the presence of light and dark areas, as shapes of their own.* The therapist provided technical support to reach this way of observation, the way to reach correct proportions and using the continuum between black and white to depict 3D. The resulting drawing is shown in image 3.

Image 3. Charcoal drawing of the form modelled during session 2.
Emphasis was given to the presence of light and dark, proportions and the correct representation thereof.

In the *third session* the modelled form of session 2 was used again as the object to draw according to observation. This time it was drawn 'in negative': now the form was left out of the drawing and the surroundings were drawn (Image 4). *Thus, a different way of looking at the form/ surroundings compared to the previous time was requested. This was done both to give Dewi comfort (by using known material and her own art object) and to challenge her with a new/ different way of looking at her modelled form, to create the possibility that Dewi could experience different perspectives and different ways of observing.* Dewi drew quietly.

Image 4. Charcoal drawing of 'rest form'.

Some session time was left for another assignment employing charcoal drawing. This time the starting point of the drawing was abstract in nature. Dewi was invited to draw several randomly positioned squares of various proportions on a piece of paper. The squares were subsequently blackened as much as possible. Then two connecting lines were drawn between adjacent squares. Finally, the connecting planes were filled with a continuous gradient from black to white (Van den Berg, 2007).

Dewi liked to work with charcoal and devoted herself to the proper execution of the assignment. She succeeded in gradually changing the dark into the light (Image 5). Charcoal was on her hands and lower arms – much in contrast with her neat and punctual appearance. The therapist interpreted this as that Dewi released some of her control and hyper-alertness, really connected with the charcoal drawing and became in a flow state of mind.

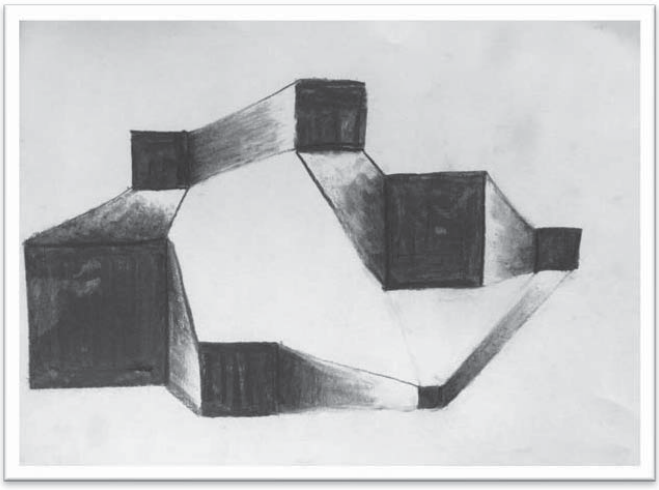

Image 5. Charcoal drawing of interconnected dark squares.
Emphasis was given to darkening of the squares and the gradual enlightening of the connections between the squares.

At the end of the session the upcoming summer break was brought up by the therapist. She asked if Dewi was interested in suggestions for artistic exercises at home. Upon approval, the therapist suggested to continue drawing from observation (and emphasize the correct representation of size, proportions and tones of light and dark) using charcoal, as in therapy. Also, the copying of black and white portrait photographs was suggested and finally, the use of soft pastels in copying impressionistic art (e.g. Monet).

In the *fourth session* the copying of a portrait photograph (from a newspaper) was performed to illustrate an earlier suggestion for the summer break. Dewi was reassured and challenged as well during the art work: the use of known material and working to the observation were to comfort her. Copying the photograph in upside-down position was meant to challenge her and to build further on the process of experiencing new ways of observing (initiated in sessions two and three). The therapist again de-emphasized convulsive detailed drawing and stimulated the observation and representation of the larger image with dark and light areas and shades of grey.
At the end of the drawing process the drawing (Image 6) was turned and compared to the original. Dewi was surprised and thrilled to learn that the copy drawing looked like the original photograph.

*Image 6. Charcoal copy of a photograph***.** Emphasis was given to the observation and drawing of different forms and planes and different shades of grey by turning the photograph upside down.

A summer break of six weeks followed. Dewi bought some art materials, performed some art work and practiced observation of objects.

The therapy was resumed in the *fifth session* with a basic exercise in the field of black and white encounters (Mees-Christeller & Mees, 2005). Dewi was invited to darken the bottom of a drawing paper with charcoal and to 'dissolve' the darkness into the light whilst working upwards. The dark bottom was to be convex in nature. *This was done to give Dewi the (unconscious) feeling of being supported, to further build on a feeling of safety and create circumstances to experience (inner) relaxation*.

Dewi devoted herself to the art work intensely and silently. It was difficult for her to create a black, convex bottom. The therapist noted that it was difficult to get insight in Dewi's experiences during the drawing exercise. The therapist records that she had the impulse to raise questions (which she had not had before) but that Dewi's answers were unclear and not fluently given as if she rejected to the conversation. Dewi didn't finish the drawing.

The *sixth session* was devoted to finishing the drawing. As in the fifth session Dewi experienced difficulties in drawing the bottom dark and diminishing the dark fluently into the light (Image 6). Again, it was difficult for the therapist to get an idea of the inner process Dewi went through as Dewi didn't voluntarily express her feelings and poorly answered questions raised by the therapist.

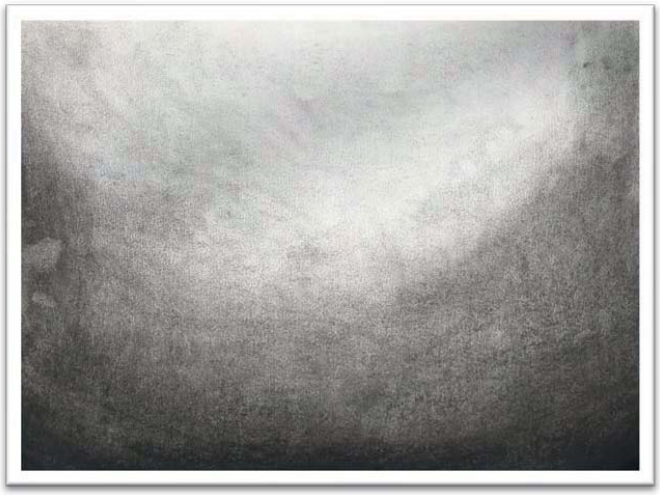

Image 7. Charcoal drawing. Emphasis was given to the fluent change in darkness from the bottom part of the drawing to the upper part.

At the end of the sixth session the therapist noticed that Dewi succeeded in the assignment, she appeared calm and relaxed, which the therapist interpreted as that she was ready for a next step in the therapy. The therapist decided to open up the possibility to address the period with some anxious events in Dewi's early life, although without the desire to openly address Dewi with the experiences. She rather wished to give Dewi the non-verbal possibility of re-engaging in the fear and the longing for comfort during and after the frightening experience (connecting to feelings, treatment goal 3). The therapist asked Dewi to bring a photograph taken in that period to the next session.

Dewi indeed brought a photograph of herself at the age of 6 in the *seventh session*. Without explicitly focusing on the feelings and experiences at that time, Dewi was invited to copy (and enlarge) the photograph in a charcoal drawing. Both the use of charcoal and the copying process were familiar to Dewi and therefore meant to be comforting. The use of a personal photograph was new and addressed the time in which the anxious events occurred. *The implicit purpose of the assignment was to connect with the emotions at the time the photograph was taken, in a safe environment, while feeling the technical and empathetic support of the therapist. Through art work one can distance from memories and emotions, in this case because one focusses on the observation of lighter and darker areas in the picture and tries to copy that as accurate as possible. During this process, it is also possible to gain a*

different connection with the child in the picture, e.g. more empathic, with mildness and understanding.

Dewi's attention was withdrawn from possible negative feelings associated with the photograph by addressing a novel drawing technique using charcoal. She was invited to start the drawing process by darkening the whole drawing paper. Then, she was instructed to use an eraser to give form to the bright spots and planes of the photograph. Shades in black and white were achieved by changing the intensity of erasing. If too much charcoal was removed 'normal' charcoal drawing was used.

The exercise was technically challenging. In the beginning Dewi was unable to concentrate and did not know how to start. The therapist guided and assisted her in the process. She led her through the correct observation of planes and shades in the photograph, towards the correct representation of young Dewi in the drawing. The support helped Dewi to overcome her initial reservation and to engage in the exercise. Slowly but surely, she understood the novel drawing process and started 'to draw with an eraser'. Dewi worked quietly. The therapist experienced Dewi's unspoken wish not to be disturbed whilst working.

At the end of the session Dewi spontaneously told that she experienced focus and flow during charcoal drawing. Negative thoughts diminished during the art work.

The copy of the photograph was not finalized after one session (no picture available) and had to be concluded in the *eighth session*. However, Dewi forgot to bring the original. A different assignment with charcoal and shades of black and white was therefore used instead (Image 8).

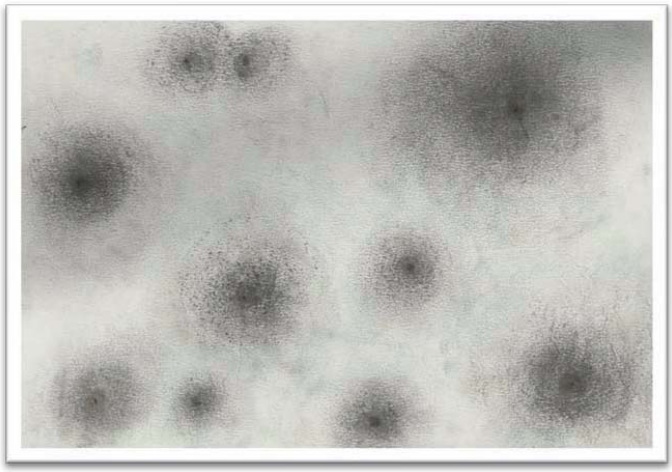

Image 8. Charcoal assignment. Black dots were placed randomly on a sheet of paper and were faded out to the periphery (van den Berg, 2007).

In the *ninth session* Dewi continued the copying process initiated in the seventh session. She was technically more capable of doing so. She succeeded in bringing nuances in the dark and became happy and proud about the result (image not shown due to privacy reasons) and her own drawing skills. Inner feelings were not explicitly expressed, and no conscious attention was paid to the shocking events either. However, the therapist noted that Dewi was at ease emotionally. At the end of the session Dewi comfortably spoke about the importance of being courageous in life.

The therapist then wanted to address Dewi's anxiety further and invited Dewi in the *tenth session* to envision a cave. She verbally described a cave with an opening through which light from the outside world entered, resulting in different tones of darkness in the cave. She invited Dewi to draw this mental picture using charcoal for the inside of the cave and soft pastels for the outside world. She also presented Dewi with photographs from the inside of caves to exemplify the changing light intensity.
During the art work, attention was fully payed to the transition of darkness (inside the cave) to lightness (nearer the opening of the cave and the outside world). Dewi made the dark-light transition before and in this way the assignment was comforting to her. *The theme of the drawing (experiencing the cave as a safe place and looking to (and later on engaging in) the outside world) was meant to (unconsciously) invite Dewi to positively engage in life (Philipse & de Vries, 2012).* This exercise was chosen in connection to treatment goal 4, enhancing the (positive) interaction with the outside world. The outside world appeared calm and still (Image 10).

Image 10. Drawing of a cave using charcoal and soft pastels. The cave was drawn according to Dewi's own imagination.

In the *eleventh session* Dewi was invited to further explore the cave and the opening to the outside world by moving towards the cave entrance. Again, charcoal and soft pastels were used and photographs of caves were presented. Dewi could decide how fast she wanted to move from the depth of the cave to the opening. The therapist followed her pace, encouraging Dewi to look around in her cave and indicate exactly what she saw. The transition of dark into light imposed some problems, likewise, the correct use of perspective. The therapist gave technical support to overcome these problems as much as possible.

The outside world looked warm and inviting and Dewi's cave opening was larger than the previous time but she herself appeared to be safely, inside the cave (Image 11).

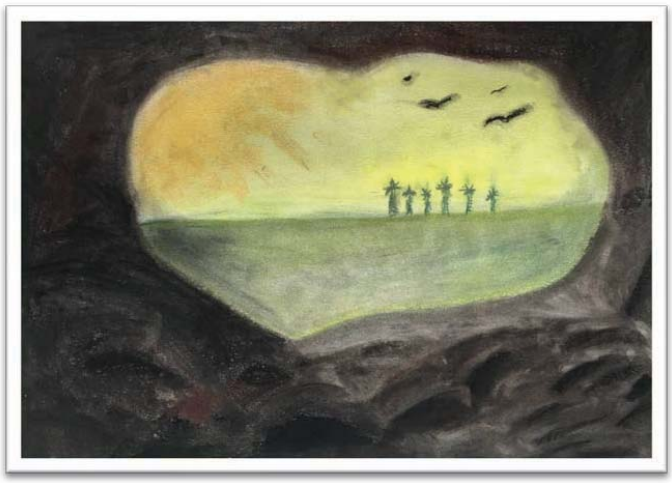

*Image 11. Drawing of a cave using charcoal and soft pastels***.** The cave was drawn from Dewi's own imagination. At the horizon, trees are visible and birds are present in the sky.

In the *twelfth session* Dewi was invited to even further explore the cave and the outside world by moving closer to the cave entrance (or even beyond). Again, charcoal and soft pastels were used. Again, problems with the dark-light transition and perspective were met which were overcome with technical support of the therapist. At a certain moment Dewi's focus changed from the inside to the outside. Dewi enjoyed the art work and appeared relaxed. Again, a relatively calm, bright and inviting outside world emerged (Image 12).

*Image 12. Drawing of a cave using charcoal and soft pastel***s.** The cave was drawn from Dewi's own imagination. Dewi indicated that the person on the righthand side was a fisherman's wife.

In the *thirteenth session* Dewi was invited to draw the outside world with soft pastels. Attention was paid to gradients of colour (lighter sea and sky nearer the horizon).
During art work Dewi focused on the reflection of the sun in the water and enjoyed herself. She admired the drawing and the outside world that she created, the space and the calmness (Image 13).

Image 13. Drawing of the world outside the cave using soft pastels. A sunset in the sea, with birds in the sky.

The *fourteenth and final session* was used to evaluate the therapeutic process. The therapist prepared an exposition of all work Dewi had made during therapy (Images 1 to 13) and used the art work as a starting point for reflection.

Dewi looked back at a process that she experienced as helpful. Working with charcoal had been new to her, but a great experience. She liked to draw and became calm doing so. She had worked with clay, charcoal and soft pastels at home but noted that it was more difficult to work at home than during sessions of art therapy. Art therapy had become a time and place to experience inner peace.

Follow-up and outcomes

Weekly scores of main complaints

Levels of anxiety, hypochondria and tension were measured at the beginning of each therapeutic session (VAS scale). Dewi gave one score for the average of the week (Figure 1). Tension gradually decreased from severe (7-8) in the first four weeks of therapy to mild (2-3) in the last four weeks and fluctuated in between. Hypochondria increased after the first two sessions and dropped after the fifth session to a level slightly lower than at the beginning. Anxiety was moderately severe at the beginning (6) and fluctuated between sessions between 3 and 6 for unknown reasons. In the final weeks of art therapy anxiety diminished to mild (2-3).

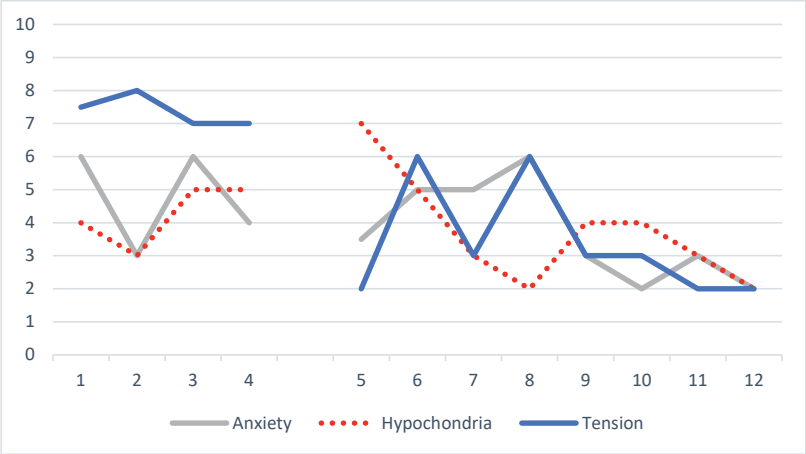

Figure 1. Weekly scores of Dewi's major complaints in time. Scores were given at the beginning of every session with respect to the experienced levels of anxiety, tension and hypochondria the week before scoring. 0: not present, 10: highest level thinkable.

Outcomes of anxiety, quality of life, emotion regulation and executive functioning

After AT (T1) the same measures as those prior to AT (T0) were used to quantify symptom severity. The outcomes are presented in Table II. Graphs for each of the measures were constructed and compared to norm scores (Figure 2) (LWASQ: Scholing & Emmelkamp, 1992; DERS: Gratz & Roemer, 2004). A clear decrease of anxiety symptom severity is shown. On all subscales (somatic, behavioural and cognitive) the scores after therapy approach norm scores in the healthy population (Table II). Subjective quality of life improved only by 2 points and a difference of at least 4 points is considered to be a reliable improvement (Van Nieuwenhuizen, Jansen-de Ruijter, Nugter, 2015). This suggests that the experienced quality of life was apparently not influenced during therapy (Figure 3).

Dewi experienced less difficulties in emotion regulation after AT. The outcomes indicate improvements in *clarity of emotions*, *impulse control*, *acceptance of emotions*, *access to emotion regulation strategies* and *goal oriented action*. *Access to emotion regulation strategies* improved the most and approaches the mean of the normal female population (Table II; Figure 2; 3).

The total score of daily behavioural executive functioning (EF) improved, but remained in the clinical range. All domains of EF improved, except for *task evaluation* which showed no changes (Table II; Figure 4). *Inhibit* and *self-monitor* improved from subclinical to normal scores. *Shift* and *emotion control* improved but were already in the normal range. All other

domains (*initiate, working memory, plan/organize* and *organization of materials*) improved, but these scores remained in the clinical range (Figure 3; 5).

Table II. Outcomes of self-report measures at T0 (prior to art therapy) and T1 (after art therapy)

	T0	T1	Interpretation
			Norm scores [mean (SD)] in adult population (n=103)
Anxiety (LWASQ total)	**82**	**64**	**62.0 (15.9)**
Somatic (physical aspects of anxiety)	33	24	23.5 (7.1)
Behavioural (avoidance)	21	17	16.1 (6.0)
Cognitive (worry and rumination)	28	23	22.4 (6.7)
Quality of life (MANSA)	**63**	**65**	**64/65**
			Norm scores [mean (SD)] in female population (n=260)
Difficulties in emotion regulation (DERS total)	**112**	**87**	**77.99 (20.72)**
*Lack of **clarity** of emotions*: the extent to which individuals know (and are clear about) the emotions they are experiencing	15	13	10.61 (3.80)
*Lack of **awareness** of emotions*: inattention to and lack of acknowledgement and awareness of emotional responses	13	14	14.34 (4.60)
*Difficulty in controlling **impulses***: difficulties remaining in control of one's behaviour when experiencing negative emotions	24	17	10.82 (4.41)
***Non-acceptance** of emotions*: tendency to have negative secondary emotional responses to one's negative emotions, or non-accepting reactions to one's distress	14	10	11.65 (4.72)
*Limited access to emotion regulation **strategies***: belief that there is little that can be done to regulate emotions effectively, once an individual is upset	25	17	16.16 (6.19)
*Difficulties engaging in **goal**-directed action*: difficulties concentrating and accomplishing tasks when experiencing negative emotion	21	16	14.41 (4.95)
Executive Functioning (BRIEF-A total)	**79**	**71**	**T-scores**: <60: normal range 60-65: subclinical range >65: clinical range
Inhibit: ability to control impulses (inhibitory control) and to stop engaging in a behaviour	63	55	idem
Shift: cognitive flexibility, ability to move freely from one activity or situation to another; to tolerate change; to switch or alternate attention	54	46	idem
Emotional control: ability to regulate emotional responses appropriately	59	54	idem
Self-monitor: ability to keep track of the effect of one's own behaviour on other people	65	56	idem

Initiate: ability to begin an activity and to independently generate ideas or problem-solving strategies	80	70	idem
Working memory: ability to hold information when completing a task, when encoding information, or when generating goals/plans in a sequential manner	85	79	idem
Plan/organize: ability to anticipate future events; to set goals; to develop steps; to grasp main ideas; to organize and understand the main points in written or verbal presentations	86	80	idem
Organization of materials: ability to put order in work, play and storage spaces (e.g. desks, lockers, backpacks, and bedrooms)	86	77	idem
Task evaluation: ability to check work and to assess one's own performance	79	79	idem

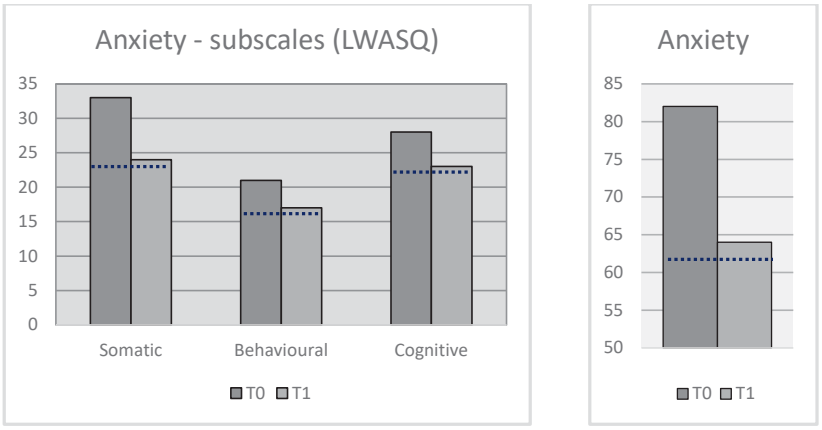

Figure 2. Outcomes of anxiety. Scores of Dewi are shown at T0, prior to therapy; and T1, after art therapy. The dotted black line represents norm scores in healthy population (n=103) (Scholing & Emmelkamp, 1992).

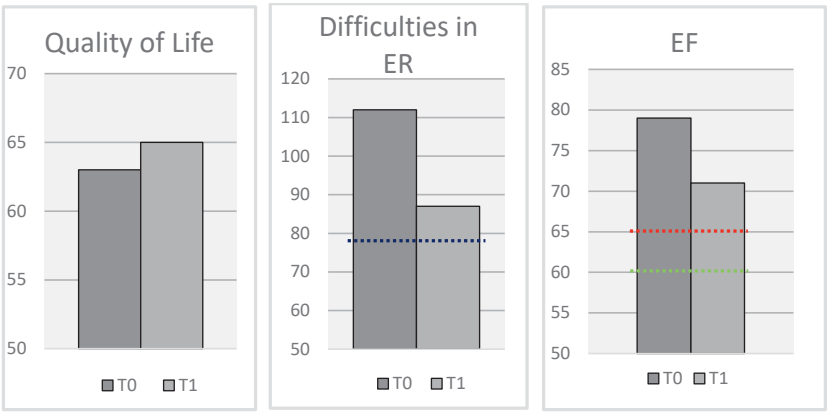

Figure 3. Outcomes of Qol, ER and EF. Scores of Dewi are shown at T0, prior to therapy; and T1, after art therapy. The dotted blue line represents norm scores in in female population (n=260) (Gratz & Roemer, 2004); The dotted green line represents normal T-scores (<60); the dotted red line represents clinical T-scores (>65). Area between the lines is subclinical range (60-65).

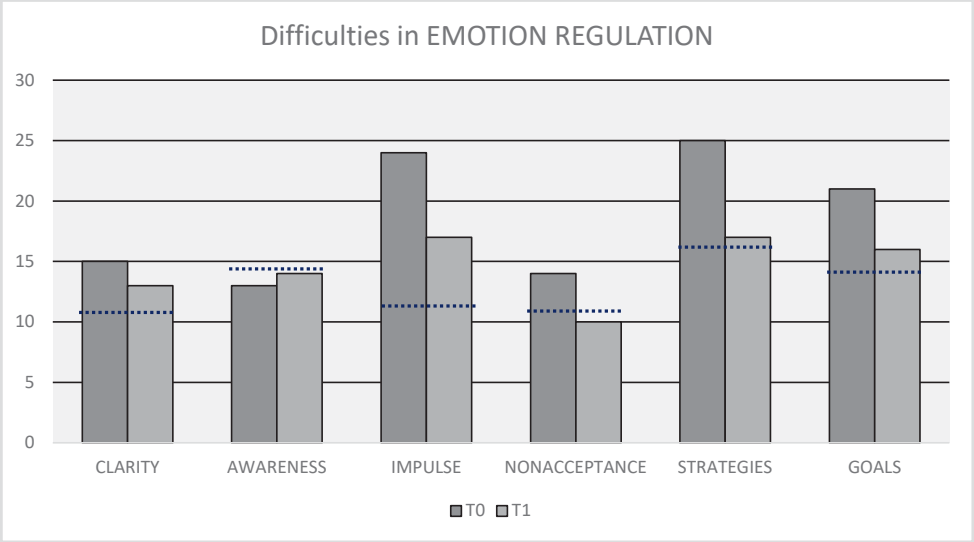

Figure 4. Subscales of DERS. Scores of Dewi are shown at T0, prior to therapy; and T1, after art therapy. The dotted line represents norm scores in female population (n=260) (Gratz & Roemer, 2004).

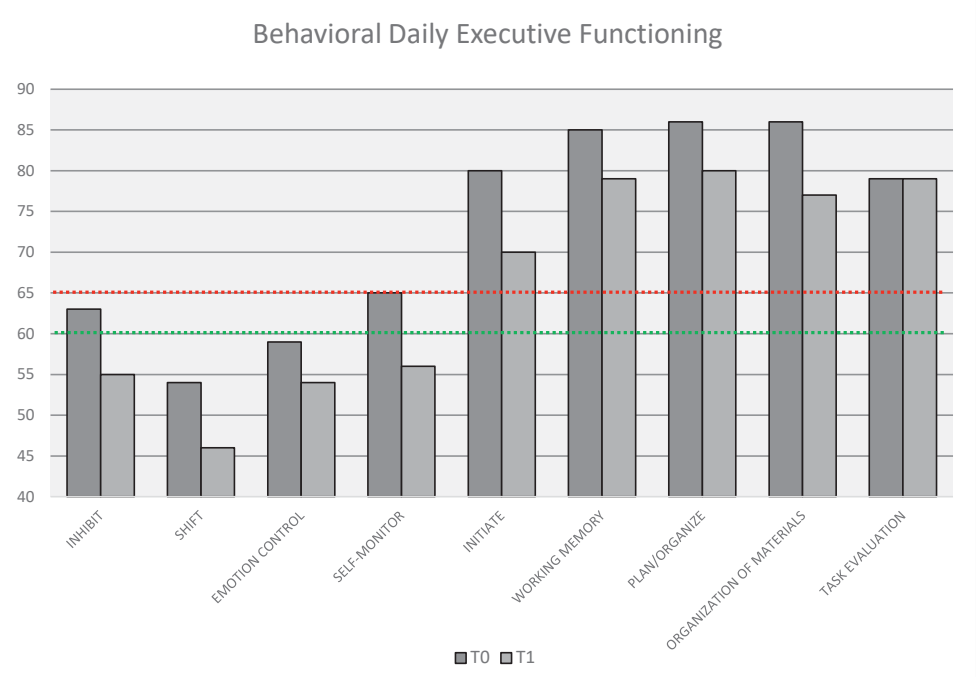

Figure 5. Subscales of BRIEF-A. Scores of Dewi are shown at T0, prior to therapy; and T1, after art therapy. The dotted green line represents normal T-scores (<60); the dotted red line represents clinical T-scores (>65). Area between the lines is subclinical range (60-65).

Therapist perspective on outcome

The therapist noted, next to the above-mentioned themes, that the interaction between Dewi and herself became more and more relaxed during therapy. She is quite confident about the positive effect of the art work on Dewi's health status both from her own observation and Dewi's verbal reflections in sessions and the evaluation.

Client perspective on outcome

About four months after therapy Dewi was interviewed by one of the researchers. With respect to her initial complaints Dewi noted that the intensity of her anxiety was reduced. She was still claustrophobic but was better able to handle it. Hypochondria had improved by 70 to 80%, to her own opinion.

With respect to art work she noted that she had overcome her initial resistance of not being able to draw. She had had some experience with clay work and sculpting, but not with drawing. She enjoyed *"playing with light and dark"* with charcoal. She found it hard to work with her own childhood photo. It brought back feelings of loneliness that she experienced at that age. But "*by drawing it, you distance yourself from it, from the feelings and the meaning. You look at it and draw that*."

She experienced AAT as very pleasant. Working on the art assignments stopped her thoughts. She indicated that she was just busy looking and figuring out what to do. To be present in the moment made her experience peace and concentration, "*it was almost as meditating, and it helped me to relax. In this way it contributed to soften my feelings towards my anxiety".*

Moreover, the different way of looking at/ observing reality, as experienced during AAT, had given her the insight that it is a choice to focus on the shadow instead of the light. In daily life she spent less time anticipating for threatening situations than before AAT. She became less evasive for confrontations with fear or panic.

She experienced AAT as demanding but in a completely different way than verbal therapies: *"Verbal therapy is hard work. You have to dig into yourself so much. You do not always feel like opening up, sometimes you just don't feel like it, or it is quite tough. With art therapy it is also hard work, but in a different way. You can lose yourself for a moment in what you are doing. Art therapy, in my opinion, addressed relaxation. I was not really concerned with my emotions, but much more focused on 'making it flow'."*

AAT did not demand to explore emotions, didn't request correct wording, but gave a sphere of serenity and comforting silence in the presence of a caring, well prepared, to the point and clear therapist, according to Dewi.

A year later (March 2019), Dewi was interviewed again and she indicated that, looking back, her total attitude towards her anxiety had softened. "*I really saw a development in the drawings, working towards something. Working towards myself (child photo), recalling moments. As if it opened. Just like the end of a tunnel. It felt like softening. And cheerful, light-weighted. That there was light at the end of the tunnel. Softening to myself, less hardness to myself. Maybe the fear is not gone and it never goes away completely, but that's okay. Everyone has something, I can take the time. I experienced relaxation through realizing that.*"

The claustrophobic complaints are still present, but to a limited extent. Her judgement about her anxiety changed into a more lenient attitude towards herself and her anxiety, which makes it less stressful and easier to cope with. The hypochondria symptoms are sometimes present, but less overwhelming than before. Sometimes the symptoms occur and then she goes to her GP for reassurance. Also here, she is more able to put experiences in perspective and to accept emotions as being temporarily. She can easily talk about her process and sharing with her husband and other people has proven to help. She asks for support when needed.

Connection of therapeutic elements to improvements of ER and EF

The careful, thorough and empathetic observation of Dewi and the trained individual-oriented decision-making by the art therapist is key to the design of the therapeutic process. The most prominent improvements (Figures 3 and 4) were measured for emotion regulation (ER), of which *acceptance of emotions, access to ER strategies* and *goal-oriented action* approached the norm scores. Executive functioning (EF) did improve as well, but remained overall in the clinical range, except for *inhibition* and *self-monitoring*. The therapist did not explicitly aim for either of the outcomes.

Based on the data, we explore now how the therapeutic elements (techniques, material and or specific assignments) may have contributed to the observed effects. With respect to ER the question is: how did art work improve *goal-oriented action, access to ER strategies* and *acceptance of emotions*?

Goal-oriented action is probably trained as clear goals were set by the therapist at the beginning of all sessions. The art work focused, amongst others, on achieving the goal and had

to be performed in a pre-determined way. It is assumed that this unconscious addressing of goal-oriented action improved during art work through analogue processes (Smeijsters, 2008), the experience of working towards a goal was applied to other situations in life. Analogy is thought to occur between the non-verbal processes in the visual medium and non-verbal psychological regulatory processes (Schweizer, Bruyn, Haeyen, & Henskens, 2009).

The same applies for *access to ER strategies*. This is, in essence, the request of a multitude of ways to respond to a certain situation. In this case it is addressed unconsciously / implicitly by the multitude of ways to work with charcoal (images 3, 4, 6 and the personal photograph) and the different types of assignments (working to the observation in images 3, 4, 6 and the personal photograph; abstract work in images 5, 7 and 8 and visionary work in images 10-13). The experience of using charcoal in different ways is supposed to enhance flexibility and creativity. *Acceptance of emotions* has probably received (in)conscious attention in sessions 7 and 9 and in the cave series (images 10-13). Although it was not explicitly mentioned, it seems likely that Dewi experienced several emotions in the indicated sessions. By focusing on the art work she was able to support herself and accept her emotions.

The content of the therapeutic process can also be linked to improvements in executive functioning. The subscales *inhibit* and *self-monitor* showed improvements from (sub)clinical range to normal range. Overall, specific skills were practiced during the artistic exercises. These exercises were not only intended to provide experiences and insights within a safe environment, but were also intended to practice skills, which are related to aspects of executive functioning: e.g. practicing observation, concentration and restraint. *Inhibition* is presumably trained in the various assignments in which gradual changes from black to white were explicitly made (images 4, 7, 8, 10) and the various assignments that aimed for the correct presentation of reality (images 3, 4, 6 and the personal photograph). These exercises require focus and inhibition of impulses, because strict rules must be followed to accomplish the art exercise. Dewi experienced focus and concentration during the assignments. *Self-monitor* is defined as the ability to keep track of the effect of one's own behaviour on other people. A connection between working on this skill and the content of the therapeutic process is not obvious in the description of the sessions, and therefore cannot be hypothesized from these data.

Conclusions on outcomes

The therapeutic process consisted of a specific series of technical steps and assignments that were thought to be both therapeutically meaningful and interesting (comforting and challenging in an acceptable balance) to Dewi, to allow her to accomplish the tasks and gain self-confidence. The consequent use of charcoal was meant to give support and a feeling of safety (predictability) in the therapeutic setting. The different techniques were chosen to challenge Dewi leading to a feeling of confidence when mastered. The treatment goals were not verbally or consciously addressed, but implicitly through the art assignments.

The first treatment goal - enhancing (inner) relaxation - was achieved. Dewi indicated in the interviews that she experienced peace and relaxation during art work, and relaxation in general. The second treatment goal - releasing control mode / hyper-alert cognitive schemas – seems to be achieved as well, because Dewi indicated that she could lose herself in the art work. The third treatment goal – connecting with feelings – was addressed through the series of 'cave in landscape' drawings, by which Dewi could experience a dark, small place as a (inner) safe place in connection to a bright, calm and friendly outside world by Dewi's own imagination, as a gentle, 'exposure'-like experience. The outcomes of the questionnaires show improvements in emotion regulation, of which *acceptance of emotions* improved into the normal score range. For accepting emotions, it is needed to be connected to the emotions first. This suggests that the third treatment goal was achieved as well.

The fourth and fifth treatment goals - improving the objective observation of the outside world and enhancing the (positive) interaction with the outside world - were achieved through (subconscious) training of objective observation skills during art work. Drawing from observation is thought to improve more objective observation in everyday life. This may have resulted in this case in a more objective observation of situations causing panic, more confidence that these situations can be handled and consequently a more open mind towards potentially anxious situations and subsequent behaviour.

Discussion

The aim of this case report was to describe a typical AAT intervention process and to explore possible connections between therapeutic elements and improvements of emotion regulation and executive functions, contributing to anxiety reduction.

The specific case of Dewi suggests that AAT resulted in anxiety symptom reduction and improved emotion regulation and executive functioning. The description of the process, combined with the client perspective indicates that Dewi was treated in a safe and supporting environment allowing for relaxation and pleasure during art work whilst using and improving emotion regulation skills and executive functions. The description of the process illustrates that this learning process happened subconsciously (implicit) and not through conscious processes as in CBT.

Anxiety is known to be associated with poor emotion regulation (e.g. Mennin et al., 2005; Ziv, Goldin, Jazaieri, Hahn & Gross, 2013; Jazaieri, Morrison, Goldin & Gross, 2014; Diefenbach, Assaf, Goethe & Guerorguieva, 2016). Improving emotion regulation is connected to reduction of anxiety symptoms (Cisler & Olatnuji, 2012). Emotion regulation can be explicit or implicit (Gyurak, Gross & Etkin, 2011). The explicit process, demanding conscious effort and awareness (Gyurak et al., 2011) can be consciously influenced. AAT appears to have a different approach. The emphasis in AAT not on consciously addressing the cause(s) of the anxiety but on initiating a guided, implicit learning curve by experience, instead of guided, conscious reflection. The focus is more on improving implicit emotion regulation, which is thought to occur automatically in response to stimuli (Gyurak et al., 2011). The stimuli in AAT are the specific art assignments, aiming for the profound experience of colors, shapes and atmospheres and dynamics.

Our hypothesis is that this implicit route towards improving ER may lead to strengthening of implicit ER skills, but may evolve into explicit ER as well, through a cognitive process that is set in motion within the client. Further studies are needed to explore these hypotheses.

It is important to note that the content of this AAT treatment process is specific for this one client. Exercises are not to be generalized to other cases with comparable complaints by (untrained) therapists as differences between clients with respect to personality, personal

experiences, coping strategies, comorbidity, social support, personal preferences for materials and assignments will influence the effect of each AT exercise.

To further substantiate the role of the therapeutic elements that were identified in this case, more case reports are to be studied. This will lead to more insight in the relations between art work and alterations in aspects of emotion regulation and executive functioning and hence to a better understanding of the mechanisms, and thus the art therapy specific factors by which the therapy exerts its effects. As a result, the construct of AAT will become more clear and comprehensible, and subsequently the specific factors can be tested in effectiveness studies.

Strengths and limitations

This case report is the first to describe an AT treatment process based on prospective data collection and according to scientific guidelines (Gagnier et al. 2013, Abbing et al. 2016). It provides a detailed insight in the treatment process of AAT for anxiety, for the first time supplemented by outcomes of pre- and post-measurements, and an exploration of possible connections between therapeutic elements and improvements of emotion regulation and executive functions.

The quantification of complaints allowed for the comparison of the severity of complaints before and after AAT and thus for more precise judgement of therapeutic effects than earlier AAT case reports (e.g. Solheim, 2002a, 2002b). The quantification of ER and EF opened the possibility to compare improvements with therapeutic elements (material, technique, assignment etc.) and to start studying the (or a) mode of action of AAT (2.3.6). This has not been possible earlier due to the lack of data.

Unfortunately, it was not possible to create a complete description of the process. Although the therapist was requested to carefully document all stages in the process (Abbing et al. 2018; Abbing et al. 2019), some information was lacking from the therapist file. For instance, arguments that were used to select the specific assignments were not provided, the professional attitude per session was not documented and notes on Dewi's daily life experiences (between sessions) were not present in the case file either. It is therefore recommended to interview the therapist after each therapeutic session and or video-tape all sessions. However, this will not be possible in all cases and may also influence the normal course of therapy.

Takeaway message

This case report provides insight in the route along which AAT may have led to anxiety reduction through specific art assignments. By implicitly addressing aspects of ER and EF, ER and EF were improved and anxiety symptom severity was reduced. The process by which AAT improves ER and EF may differ from the process by which verbal therapies, such as CBT, exert its actions. Future studies should address the question whether AAT may complement or may be an alternative to CBT in specific patient subgroups, or may be suitable for patients that do not (sufficiently) respond to CBT.

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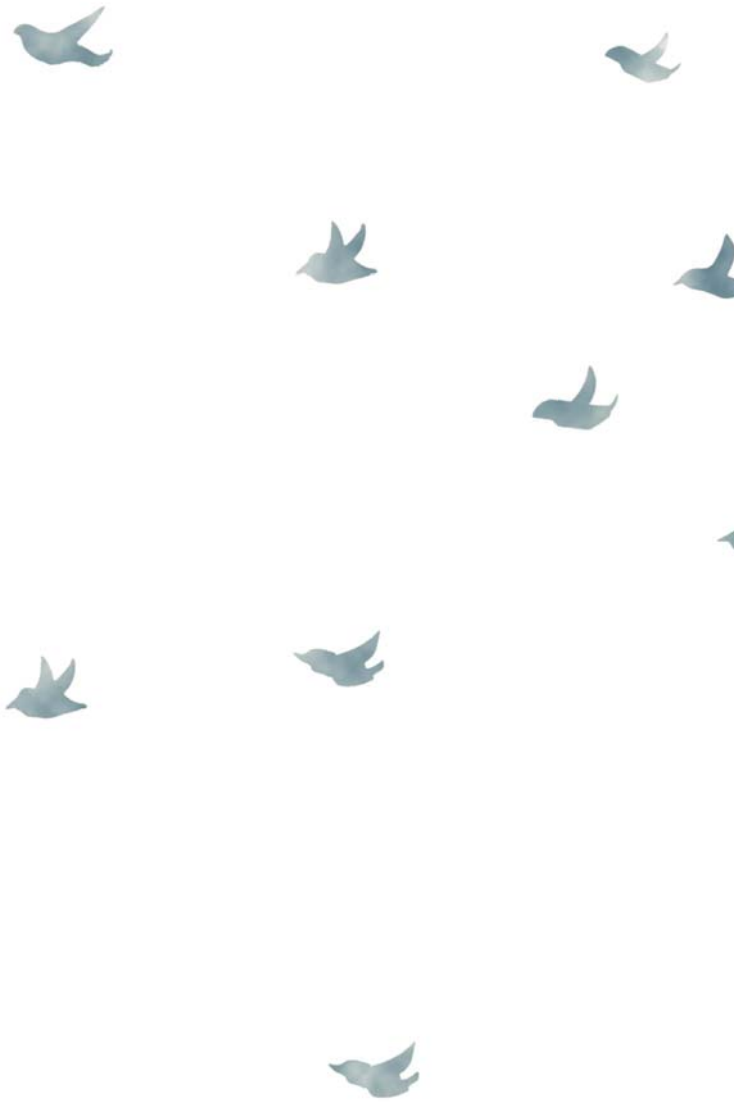
“The medication has been lifesaving. But I think the art therapy was life-healing. Medication is something you can continue to use your whole life and nothing changes inside. But you do the therapy because you hope it changes you inside so that you can live without medication.” (Female participant, 52 years old)



Chapter 7

Summary and General Discussion

Summary

The aim of this PhD thesis was to investigate if art therapy is effective and to explore the supposed working mechanisms, with a focus on the treatment of anxiety.
The main research question was:
Is there evidence for the effectiveness of art therapy in the treatment of anxiety in adults and which working mechanisms of anthroposophic art therapy can be identified?
Next to the first aim of investigating effectiveness and exploring working mechanisms, the second aim was to contribute to the development of the profession of art therapists, by equipping them with tools for systematic data collection and publication of case reports, in order to support art therapists in contributing to the body of knowledge and the body of evidence.

Art therapy is an often provided treatment option in mental healthcare, and is often indicated for anxiety disorders (Van Balkom et al., 2013). Anxiety is a major problem for individuals in our society (Nederlands Kenniscentrum Angst en Depressie, 2019). Preferred treatment for anxiety disorders according to Dutch health care standards (Hassink-Franke et al., 2012), consisting of cognitive behavioural therapy (CBT) and/or pharmacotherapy, is effective but not (sufficiently) beneficial for all patients (Heldt, et al. 2003; Tyrer, Seivewright, Johnson, 2004; Linden, Zubraegel, Baer, Franke & Schlattmann, 2005; Zou, Ding, Flaherty & Dong, 2013; Pelissolo, 2008; Katzman et al., 2014). Other approaches (alone or in addition to/ combined with CBT and/ or medication) may be successful in specific subgroups of patients, but these interventions need to be transparent, measurable and replicable in order to assess their effectiveness. This applies also to anthroposophic art therapy (AAT), which is a subtype of art therapy with an emphasis on offering specific artistic exercises which are thought to have a 'health promoting' effect by providing the opportunity to practice specific skills, to strengthen coping and to explore one's own feelings and cognitions within a safe setting (NKVT, 2018; Christeller et al., 2000; Hauschka, 2004; Rolff & Gruber, 2015).
To provide patients with the best possible care, therapists need to work according to the criteria of evidence based practice (EBP). EBP consists of three pillars (Lucas, 2015). Pillar 1 (clinical expertise) and 2 (patient preferences) of the EBP model are currently applied in AAT

practice: anthroposophic art therapists have developed and described AAT specific knowledge and skills, and have the knowledge and skills to adapt treatment to the individual patient and his or her relevant context. Pillar 3 (evidence from effectiveness studies) is lacking in the support of AAT treatment, since there is hardly any evidence of the effectiveness of AAT due to a lack of research in this field.

In order to provide responsible, safe and justified care, the effectiveness of AAT needs to be evaluated and working mechanisms must be explored and substantiated.

Therefore, the following questions were addressed in **PART I** of this PhD thesis:

What is the evidence so far of art therapy effectiveness in the treatment of anxiety in adults? What is the effectiveness of three months AAT in women with anxiety disorders, on anxiety, quality of life and aspects of self-regulation? And what factors contribute to anxiety reduction?

The evidence of art therapy effectiveness in the treatment of anxiety in adults

In **Chapter 2**, results of a systematic review are reported, summarizing the results of studies that address the effectiveness of art therapy on the reduction of anxiety symptoms in adults and providing an overview of intervention characteristics and supposed working mechanisms. Included were randomized and non-randomized controlled trials on art therapy for anxiety in adults. Thirteen databases were searched. Randomized controlled trials on this specific topic were scarce: only three studies met the inclusion criteria. The included studies have several flaws, resulting in high risks of bias, thus drawing conclusions on the effectiveness of art therapy for anxiety is impossible. It was concluded that the effectiveness of art therapy on anxiety has hardly been studied although it is often applied in mental health care. This emphasized the need for high quality trials studying the effectiveness of art therapy on anxiety. A narrative synthesis led to hypothesized working mechanisms of art therapy: to practice relaxation; to gain access to unconscious traumatic memories, thereby creating possibilities to investigate cognitions; and to improve emotion regulation. This systematic review showed the 'evidence gap' for a treatment that is commonly provided in clinical practice and this finding highlighted the importance of performing RCTs on the effectiveness of art therapy for anxiety in adults.

The effectiveness of AAT in women with anxiety disorders

In order to address the question whether AAT is effective, a randomized controlled trial was performed to assess the effects of AAT in women with anxiety disorders (**Chapter 3**). Fifty-nine women, with moderate to severe anxiety symptoms, and meeting the diagnostic criteria for generalized anxiety disorder, social anxiety disorder and/or panic disorder, were randomly assigned to three months AAT (10-12 sessions) or a waiting list condition. Pre- and post-measures were anxiety symptom severity (Lehrer Woolfolk Anxiety Symptom Questionnaire; LWASQ), quality of life (MANchester Short Assessment of QoL; MANSA) and emotion regulation (Difficulties in Emotion Regulation Scale; DERS), all measured with self-report questionnaires. Both per-protocol and intention-to treat analyses demonstrated effectiveness of AAT compared to waiting list condition, showing a reduction in experienced anxiety, an increase in subjective quality of life (both with large effects) and an improvement in accessibility of emotion regulation strategies (medium effect). Treatment effects remained after three months follow-up and were also observed in the second treatment group (after waiting list). Regression analysis showed that improved *acceptance of emotions* and improved *goal-oriented action* are aspects of emotion regulation that are associated with the reduction of anxiety symptoms.

Chapter 4 addressed the question whether AAT can have positive effects on executive functioning and stress regulation (heart rate and heart rate variability (HRV)), and if changes in these domains are associated with anxiety symptom reduction. Daily behavioural EF was measured with the Behaviour Rating Inventory of Executive Function for Adults (BRIEF-A) and performance-based EF was assessed with the Amsterdam Neuropsychological Tasks (ANT), by a selection of tasks measuring alertness, inhibition, cognitive flexibility and sustained attention.

Results indicated that AAT led to a significant higher HRV at rest, which can be interpreted as a lower overall level of arousal, but not to significant improvements on stress responsiveness or stress recovery. The treatment group experienced significant improvements in daily behavioural EF in the domains *emotion control*, *working memory*, *plan/organize* and *task evaluation*, but did not show pre-post treatment differences regarding performance-based EF on any of the tasks compared to the control group. At baseline, the study population had poorer performance on *inhibition* (more impulsivity) compared to a healthy study population. Subjects who experience many problems with daily EF (*cognitive flexibility* and *organization*

of materials) and subjects with poorer inhibition skills at baseline showed a larger anxiety reduction and are more likely to benefit from AAT. Improvements in self-reported *emotion control*, *plan/organize* and *task evaluation* are associated with AAT-related anxiety reduction. This study was a first exploration of possible working mechanisms of AAT in adults with anxiety. The results - improvements in emotion regulation (**Chapter 3**), in resting HRV and in daily behavioural executive functioning (**Chapter 4**) - indicate that art therapy improves regulating processes and that this plays a role in the reduction of anxiety symptom severity, but the exact mechanisms within the therapeutic process are not yet clear. In order to gain more insight in therapeutic processes, other studies are needed that can provide detailed information about the course of treatment.

Case reporting

Case studies can provide insight in therapeutic processes when published as case reports (Gagnier et al., 2013). Case reports can be used for explicating implicit expert knowledge and provide insight in individualized therapy processes, and are therefore suitable for describing the content of the AAT therapy, generating hypotheses on AAT working mechanisms. Case reports also allow for the exploration of links between the therapeutic content and generally accepted theories and provide first indications for its effectiveness. Good quality case reports are an important factor in the development of EBP. A guideline for scientific case reports could contribute to this and the question was asked whether a scientific guideline for art therapy case reports could be developed.

PART II of this PhD thesis addressed the questions:

Can the medical Case Report Guidelines be adjusted for use in AAT?

How does AAT work on reduction of anxiety? What therapeutic elements may be connected to emotion regulation and executive functioning?

In **Chapter 5**, the guideline for medical case reports (the CARE Guidelines (Gagnier et al., 2013), covering diagnosis, treatment and outcomes) was adjusted for use in AAT, following the recommended steps for health reporting guidelines. The adjustments were based on AAT literature and expert opinions. A first evaluation of the new CARE-AAT guideline showed that face validity of the guideline is good; the guideline covers all necessary information needed for a case report on AAT. However, the guideline appeared to be too abstract for individual therapists, who are often not research minded, and offers too little support to document cases

in a structured and standardized way. It was assumed that this was related to, among other things, the non-chronological ordering of information in the guideline, which makes it unclear what information must be collected and at what time during therapy. To support therapists in systematic collection and documentation of key components of the therapeutic processes, a documentation method was developed (Abbing, Ponstein, Hoekman, Van Hooren & Baars, 2018), based on the CARE-AAT guideline and was operationalized with items from art therapy professionals and researchers.

With the use of this documentation method (Abbing et al., 2018), a case that is representative for the general approach of AAT for anxiety was documented and selected for case reporting, to provide insight in an AAT process and to explore the therapeutic elements that may be connected to emotion regulation and executive functioning. **Chapter 6** concerned this case report, presenting a 54 year-old female suffering from anxiety since childhood and diagnosed with panic disorder and symptoms of claustrophobia and hypochondria. After AAT, reduction of anxiety symptom severity was shown, as well as large improvements of emotion regulation skills. Client indicated that the therapy resulted in more acceptance and tolerance towards her anxiety and a more lenient attitude towards herself, leading to reduction of symptoms, even after one year follow-up. The description of the intervention process indicated that aspects of emotion regulation were addressed implicitly through different art assignments in this specific AAT case.

Main findings

The studies presented in this thesis aimed to gain insight in the effectiveness and to explore working mechanisms of anthroposophic art therapy for women with anxiety. The second aim was to contribute to the development of the profession of art therapists, by equipping them with tools for systematic data collection and publication of case reports, in order to support art therapists in contributing to the body of knowledge and the body of evidence on the working mechanisms in art therapy.

The first main outcome is that three months AAT led to a significant reduction of anxiety symptom severity, compared to waitlist condition, and to a significant improvement of experienced quality of life.

The second main outcome is the effect of art therapy on aspects of self-regulation: perceived emotion regulation, stress regulation and perceived executive functioning, indicating that art therapy improves several aspects of self-regulation that contribute to anxiety symptom reduction. Although no treatment related changes were found in executive performance during specific tasks on aspects of executive functioning, heart rate variability changed during rest and level of self-reported inhibition contributed to prediction of treatment effects. Thirdly, based on first steps in the exploration of working mechanisms, the hypothesis arises that specific art therapy exercises may lead to specific effects. This was illustrated with a case report, indicating that the therapy took place in a safe and supporting environment allowing for relaxation and pleasure during art work whilst using and improving emotion regulation skills and executive functions. The description of the process suggests that this 'learning process' happened subconsciously (implicit) and not through conscious processes.

Based on the foregoing, we can conclude that art therapy can be effective for the treatment of anxiety symptoms in female adults and that some insight in working mechanisms has been gained. Further research is necessary to explore specific contribution of supposed mechanisms.

Discussion of main findings

Three months AAT led to a significant reduction of anxiety symptom severity, compared to waitlist condition (p=0.001, η_p^2=0.20), and to a significant improvement of subjective quality of life (p<0.0001; η_p^2=0.52).

The study population consisted of women who suffered from anxiety symptoms for a long period of time (mean 17,6 years, SD=18,9). Multiple anxiety disorders applied to the majority of the study population, 96% met the criteria for two to five different anxiety disorders. Comorbidity was also present in the study population, equally distributed over the two groups: 21% PTSD, 10.6% depression. These factors are all known to cause poorer treatment outcomes in general: the duration of the anxiety symptoms is an important factor for the effectiveness of treatment (Starcevic, 2010); the longer the anxiety symptoms are present and the earlier it started in life, the less favourable the treatment outcomes are (Hendriks, Keijsers,

Kampman, Hoogduin, & Voshaar, 2011). Furthermore, the severity of the anxiety symptoms is important for treatment success. The severity of the symptoms prior to the therapy is a characteristic that is related to the treatment outcomes, regardless of the type of therapy used. In different types of anxiety disorders, such as social phobia and panic disorder, the severity of the symptoms is related to the outcome of the therapy; the more serious the symptoms, the less effective the therapy is (Mululo, Menezes, Vigne, & Fontenelle, 2012; Haug et al., 2015). Given the fact that our study population had a long duration of anxiety symptoms and had high anxiety symptom severity prior to the therapy, the outcomes of our study are very positive and surprisingly show that the higher the baseline symptom severity, the more effective the therapy was (larger anxiety symptom reduction). The improvements remained during three months follow-up.

Several possible explanations can be used to understand this outcome. To start with, effects can be caused by specific or non-specific factors. Specific factors are theory-derived components of the intervention, such as from the self-regulation theory, while non-specific factors concern the aspects of the intervention and the execution that are not theoretically specified (Donovan, Kwekkeboom, Rosenzweig, & Ward, 2009). These factors also concern 'common factors' in therapy, such as therapeutic alliance, attention, therapist-related factors: empathy, authenticity and unconditional, accepting, warmth (e.g. Bjornsson, 2011; Wampold, 2001), and client-related factors: motivation, attitude and expectations.

It is possible that people with severe symptoms not always benefit enough of standard treatment, but may benefit from more intensive and personalized treatments to achieve improvements (Haug et al., 2015). Although we didn't look into outcomes of previously received treatment in our study population, it is known that patients with severe symptoms and a chronic course appear to be better treatable with a therapy that is adapted to the individual, in terms of intensity and focus (Newman, Llera, Erickson, Przeworski & Castonguay, 2013). This is the case in AAT; it is a treatment that is tailored to the individual.

As explained in the General Introduction (Chapter 1), anthroposophic art therapists may consider their intervention to be theory-driven, because it is based on theories from the anthroposophic worldview. The specific AAT theory is not well described or connected to generally accepted and studied theories. In our research, we used self-regulation theory to explore possible active components of AAT. The results indicate that these specific factors play an important role in the reduction of anxiety symptom severity through art therapy.

Besides attributing effects of AAT to specific theories, it is known that treatment effects can be due to non-specific factors as well, like motivation and expectations of the client. Positive expectations can lead to overestimation of outcomes (Asay & Lambert, 1999), through a more positive self-evaluation of mental health (Taylor & Brown, 1988). The expectations and motivation of the study population were not measured, but it is likely that the subjects might have had some positive expectations and that they were motivated to some extent to try this therapy, because they applied for the therapy themselves, knowing that a trial was conducted (since they had to sign informed consent to participate in the study). It is therefore also likely that the study population consisted of women who have (at least some) affinity with creativity and/or art making. These aspects might have caused overestimation of the effectiveness.

Non-specific factors can lead to non-specific effects, which are also known as the 'psychological placebo'. It is however not likely that the observed effects can completely be explained by placebo or non-specific treatment effects, because the observed effect is too large compared to the expected effect, and remains for at least three months follow-up after treatment, while there is no longer any individual attention during that period. This argues for the interpretation that at least part of the effect is actually achieved by specific art therapy factors, combined with non-specific treatment factors. Arguments that support this, based on the work by Kiene (2013) on the assessment of causality in case studies, are the large effect size, the relatively fast occurrence of the effect (within three months, compared to the mean duration of anxiety of 17.6 years) and the fact that the effects remain at follow-up. A longer follow-up however could have made this argument even stronger, this should be taken into account in future studies.

Other studies show beneficial effects of art therapy as well in other areas of mental health. For example, systematic reviews report on promising results for art therapy for PTSD (Nanda, Barbato Gaydos, Hathorn, Watkins, 2010; Schouten, de Niet, Knipscheer, Kleber, & Hutschemaekers, 2014; Ramirez, 2016; Wiliams & Thompson, 2010) and for a broader range of (mental) health conditions (Uttley, Stevenson, Scope, Rawdin, & Sutton, 2015; Slayton, D'Archer, Kaplan, 2010; Van Lith, 2016; Lankston, Cusack, Fremantle, & Isles, 2010).

Specific therapy factors are therefore assumed to be partly responsible for the observed effects. We explored these factors within the domain of self-regulation.

Based on the systematic review (**Chapter 2**) it was suggested that art therapy for anxiety may improve emotion regulation. This was confirmed in **Chapter 3**; significant improvements were

observed with respect to access to emotion regulation strategies. Improvements in perceived emotion regulation were highly associated with anxiety reduction; regression analysis showed that the aspects *acceptance of emotions* and improved *goal-oriented action* accounted for 46% of the improvement in anxiety symptom severity. The description of a therapeutic process (**Chapter 6**), indicated that specific art therapy exercises may (implicitly) address several emotion regulation domains: *control of impulses*, *acceptance of emotions*, *access to ER strategies* and *goal-oriented action*.

Emotion regulation involves several processes, according to Gratz & Roemer (2004). The basic skills that are needed for healthy emotion regulation are: being able to perceive one's emotional state and to be aware of one's own emotions, and the ability to accept emotions, the latter representing psychological flexibility (Dryden and Still, 2006).

In our study, *acceptance of emotions* and *goal-oriented action* were highly associated with the reduction of anxiety symptom severity. These subscales of the DERS have been shown to be linked to HRV in other studies. We found HRV to be low in our study population and higher after three months art therapy. Higher HRV is associated with higher quality of emotion regulation (Friedman, 2007; Porges, 2007; Williams, Cash, Ranking, Bernadi, Koenig & Thayer, 2015). Lower resting HRV is known to be associated with larger difficulties in emotion regulation as reported by Williams et al., 2015, with the subscale *acceptance of emotions* of the DERS as the largest predictor of HRV: low HRV is associated with low acceptance (Visted, Sørensen, Osnes, Svendsen, Binde & Schanche, 2017). Low *acceptance of emotions* is also found to be associated with high physiological arousal and high cognitive strain (Hayes et al., 2006).

As HRV is considered to be an index of ANS regulation, according to the Neurovisceral Integration Model, it is thought to regulate physiological resources to enable goal directed behaviour (Thayer & Lane, 2000). This argues for a link between the DERS subscale *goal-oriented action* and HRV.

HRV is also positively correlated with flexibility in response to demands of the environment (Friedman, 2007; Porges 2007; Visted et al., 2017). There is neurophysiological evidence for associations between resting vagally mediated HRV (vmHRV) and executive brain regions (Thayer, Åhs, Fredrikson, Sollers, & Wager, 2012). Resting vmHRV does not only represent overall health, but is also an index for the degree of brain flexibility concerning self-regulation

processes, such as executive functions and cognitive control (Williams, Freeling, Hill, Spangler, Koenig & Thayer, 2017; Williams et al., 2015).

To conclude: higher resting HRV after art therapy, reported in **Chapter 4**, can be considered as an index for improved self-regulatory ability (Segerstrom, Boggero & Evans, 2016), and is an objective measure that can substantiate the findings from self-report measures in our study: anxiety symptom reduction and improvements of ER and subjective daily behavioural EF. Therefore, we feel confident to conclude that the effects of art therapy in anxiety reduction are meaningful and supportive of further exploration of working mechanisms in art therapy to predict outcome in individual cases. This is not only useful in development of indication criteria, but also helpful in enhancing tailor-made treatment in AAT.

In **Chapter 6**, concerning a case report, it is indicated that specific skills are practiced and trained during the art therapy exercises, which are chosen by the therapist. These exercises provide experiences within a safe environment and are not only intended to practice and train skills (van Hooren, 2018), but also to gain insight in one's own emotions and the emotional impact on behavioural responses. For AAT specifically, the exercises are intended and thought to provide health promoting 'impressions' such as images and colours (Uitgeest, 2016). The practiced skills are partly related to aspects of executive functioning: e.g. following instructions (*working memory*), working autonomously on an assignment (*plan/organize*), tracking and evaluating one's own actions during the art work (*task evaluation*), learn to interact with and adjust to the qualities of different art materials and assignments (*shift*), and learn to explore and regulate emotions. This hypothetical working mechanism (improvements of perceived EF, associated with anxiety reduction through art therapy) is substantiated by the finding in **Chapter 4** that subjective improvements of the aspects *emotion control*, *plan/organize* and *task monitor* contributed for 64,7% to the anxiety symptom reduction. Since performance on specific EF tasks did not support these findings so far, further study is necessary to explore the trajectory to the improvement in daily EF functioning and to the reduction in anxiety.

Although there is still much unclear about the exact working mechanisms of art therapy, the forgoing results allow for the hypothesis that AAT is effective in the treatment of anxiety symptoms and that this is partly due to the improvement of specific aspects of self-regulation: emotion regulation and executive functioning, which can not only be seen in daily functioning

but also in improvement of resting HRV (although this improvement was not directly associated with anxiety reduction).

Strengths and limitations

The studies described in this PhD thesis have several strengths. A mix of probabilistic (difference-making evidence) and preliminary mechanistic evidence (evidence regarding possible working mechanisms) is provided for AAT in the treatment of anxiety. The difference-making evidence concerns the systematic review and the RCT; and evidence regarding possible working mechanisms concerns the case report and the secondary outcomes and analyses of the RCT. These two methods of causality assessment support each other: difference-making evidence and of mechanistic evidence are complementary because each addresses the primary weakness of the other (Illari & Russo, 2014).

The studies in this PhD thesis provide a first basis and guidance to future research on art therapy for anxiety. The positive results demonstrate the potential of art therapy and legitimate further research on art therapy for anxiety. It provides tools (CARE-AAT guideline, documentation method, an AAT case report example) for art therapists to document their work in a scientific way, building on the CARE guidelines (Gagnier et al., 2013) and adapting it to the domain of art therapy. Several stakeholder groups will benefit when CARE-AAT based case reports are written. The emphasis in this thesis was to develop and use testable hypotheses from clinical settings (Driggers et al., 2016), but case reports can also contribute to peer-to-peer communication between therapists, provide examples for case-based learning and provide patients with transparent information on the therapy (www.care-statement.org).

There are also limitations that should be discussed. A first limitation of our research is the lack of an active control in the RCT. It is therefore not possible to conclude with certainty that the observed effects are caused by therapy-specific factors. Second, the small sample size may have compromised the outcomes and may have led to non-detection of significant outcomes of stress responsivity and performance EF, or associations between improvement of resting HRV and anxiety reduction. Third, the study population consisted of a specific subgroup: only women, who were presumably motivated, and a little over 50% was higher educated. Outcomes are not to be generalized to men, nor to less motivated and/or lower educated women. Fourth, the study population was heterogeneous in nature, due to dimensional

inclusion on anxiety symptom severity. Participants did not belong to one specific anxiety disorder classification, so conclusions on the effectiveness of art therapy for specific anxiety disorders cannot be drawn. Fifth, some insight into possible working mechanisms has been gained, but still many factors need to be considered before concluding on the exact working mechanism(s) of art therapy.

Implications for future research

Studies on effectiveness of art therapy

One RCT does not provide sufficient evidence, so more RCTs are needed, and studies with active controls are recommended. CBT could serve as active control. It would also be important to study the effectiveness of CBT complemented by art therapy to evaluate if there is a larger effect than from both treatments separately, because both treatments seem to have different dynamics and could complement each other. Another important direction is to include individuals with anxiety disorders that were not responding to CBT, to investigate if these individuals do respond to art therapy and to identify patient-related factors that could provide more insight in for whom this therapy may be beneficial.

The control conditions must be designed and matched closely to art therapy on non-specific factors (Bjornsson, 2011; Safer & Hugo, 2006), to gain clarity on what art therapy can add. It is therefore recommended to include a measure of therapeutic alliance and measures of therapist-related factors (experienced by the patient) such as empathy, warmth. Analyses of interactions between these non-specific factors and other factors that contribute to improvement of symptoms can lead to identification of specific factors, that can be included in the construct (theory) of AAT. Also, a narrower study population is recommended, to be able to study the effectiveness of art therapy for specific anxiety disorders. It is recommended to select standardized instruments that are more widely used in the evaluation of severity of anxiety, like the State-Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983), to make comparison between studies more feasible.

Studies on working mechanisms of art therapy

While CBT aims at understanding and changing the personal mechanisms of anxiety and learning by influencing cognitions and strategies of 'actions' (Beck & Dozois, 2011), using explicit processes of emotion regulation, AAT appears to support implicit processes. It is

therefore important to study differences and similarities between CBT and AAT working mechanisms, in different groups of patients with an anxiety disorder. A development in CBT is the expansion with attention and acceptance-based behavioural therapies (ACT), with the aim of changing the relationship that a client has with his thoughts, using mindfulness- and acceptance techniques as well as exposure (Brown, Gaudiano & Miller, 2011; Eifert & Forsyth, 2005). Based on the outcomes of our research, it would be interesting to study whether art therapy has similarities with the working mechanisms of this new 'wave' of cognitive therapy.

Case studies

More case reports can provide more insight in detailed therapeutic processes (therapeutic elements, the structures of the therapeutic processes and their relationship with the primary outcome), leading to further hypotheses on working mechanisms and AT specific factors, that can tested in effectiveness studies.

Around 40 cases were selected during the RCT. These data allow us to study the therapeutic processes in detail, in order to gain a better understanding of the different routes to anxiety reduction. Lessons from case reports, for example about successful courses of treatment and less successful process can lead to quality improvement of AT and further development of the body of knowledge of AAT.

Patient experiences

Next to studying cost-effectiveness, studying the value of the intervention for the patients is of key importance in value-based health care (Porter, 2010). The value of an intervention can be measured using patient reported outcome measures (PROMs), questionnaires in which the patient indicates his current experienced health status and the consequences of his disorder on his daily life; and patient reported experience measures (PREMs), that question the experiences of the patient on topics such as information, patient participation, treatment and aftercare. A Consumer Quality Index (CQI) is designed for collecting these types of information and has several variants developed for a broad spectrum of health care, such as obstetrics, physiotherapy, mental health care, youth healthcare, palliative care (Zorginstituut Nederland, 2019). A CQI for art therapy is not developed yet, but could be of value for the professional field since it allows for transparency towards policy makers and health insurers.

Patient experiences can also be collected with in-depth interviews. After completing the RCT described in this thesis, 35 interviews were held with participants in the study. Qualitative outcomes can provide information about the experience of patients regarding the value of AT and the elements that led to anxiety reduction. The elaboration of these studies will be continued.

Implications for clinical practice

The studies reported in this thesis contributed to all levels of the effect ladder (Van Yperen & Veerman, 2008), which is used to assess the reported evidence of effectiveness of an intervention.

The case report (chapter 6) provided a detailed description of the intervention (level 1) and a credible intervention theory was explored (level 2). The RCT (chapters 3 and 4) provided first outcomes of effect measures (that need to be replicated) (level 3) and concerned comparative research (level 4), concluding that, according to the effect ladder, AAT for anxiety is progressing in becoming a proven effective intervention.

By analysing predictors of treatment success, we can indicate for which people the treatment may be effective. Based on our findings, individuals with the following baseline characteristics showed larger anxiety reduction: high baseline anxiety symptom severity, high levels of difficulty with emotion regulation, problems in cognitive flexibility and organization of materials, and poorer baseline inhibition scores on cognitive performance.

According to clients with anxiety, the therapy is successful. However, not all patients did benefit from the therapy. Almost 16% of the patients (7 out of 44 cases) did not show reduction of anxiety symptom severity directly after therapy, even though quality of life scores improved in all seven cases. Three of these cases were part of the first treatment group that was evaluated directly after therapy, and surprisingly, these cases showed anxiety reduction at follow up, three months after therapy. The remaining four cases that did not improve directly after therapy were part of the second treatment group, which did not have follow up measures.

Even though not all participants improved directly after therapy, it is an accessible therapy (with a financial and time investment), with no (expected) side effects and the results of our research indicate that art therapy can be continued as a treatment option for anxiety. It may be suitable for individuals who did not respond to CBT, or individuals who prefer an

experience-oriented therapy instead of a cognitive oriented therapy. It may also serve as an additional therapy next to CBT and/or medication, or may be integrated with CBT. How this could be organized in clinical practice should be subject for future research.

Art therapy has a different dynamic than verbal therapy. Common to most forms of therapy for anxiety is that alternative strategies to cope with fearful situations are learned. One of the main differences between cognitive therapies and nonverbal therapies is the level of 'consciousness' or 'outspokenness' in approach about this process of the patient.

Worry and rumination are often present in individuals with anxiety (American Psychiatric Association, 2013), which anthroposophic art therapists characterize as 'a dominance of excessive and unproductive thinking' that should be reduced in therapy. According to Borkovec (1994) (as cited in Dar & Iqbal, 2014), worrying and verbal activity interferes with emotional processing and prevents adaptive coping in individuals with anxiety. The case report illustrated that in AAT treatment, the anxiety is not 'consciously' or cognitively addressed and (excessive) talking about the anxiety is avoided, in order not to enable the individual to 'stay in the thinking-mode', enabling worry and rumination. Worry and rumination is known to be more present in individuals with high intelligence, which is also thought to be a risk factor for anxiety and other psychological disorders (Karpinski, Kinase Kolb, Tetreault, & Borowski, 2018). The majority of our study population received higher education, which may indicate that our study population has a higher average intelligence level compared to the average Dutch population. The participants were open to try a different, non-cognitive approach. The therapy requires own activity and commitment, may distract the attention from maladaptive beliefs and cognitions, and aims for the focusing of the attention towards the creative process, making the person engage in self-expression, exploration of emotions and working towards acceptance. Creating a visual art work can provide a certain distance, so that patients are not overwhelmed by feelings of anxiety (Van Balkom et al., 2013). To 'distance' oneself from the emotion during the act of creating art is believed to improve cognitive regulation of emotions (Smeijsters, 2008). Art therapy is therefore also thought to be suitable for less 'cognitive-oriented' individuals, or individuals who have difficulty expressing themselves verbally. Works of art can help to express oneself, can be a reflection of emotions, and the well-being of the individual may be served by more therapeutic options than therapeutic methods that rely on verbal qualities (e.g. Liebman, 1990; Chambala, 2008; Haeyen, 2007).

Conclusions

This PhD thesis addresses one of the easy accessible interventions that is often applied in anxiety treatment but little studied to date: art therapy; and anthroposophic art therapy (AAT) specifically.

The primary aim was to study the effectiveness of art therapy in the treatment of anxiety and explore its working mechanisms in a systematic review and a randomized controlled trial (RCT). The systematic review of (non-)randomised controlled trials on art therapy for anxiety in adults demonstrated that effectiveness of art therapy on anxiety has hardly been studied. Outcomes of the RCT showed preliminary proof of effectiveness of art therapy in the treatment of anxiety. AAT has large effects on the reduction of anxiety symptom severity in women. The therapy also improves quality of life and several aspects of self-regulation: 10-12 sessions led to a higher resting HRV (heart rate variability), improved access to perceived emotion regulation strategies and improvements in self-reported daily executive functioning. Improvements in daily executive functioning (domains *emotion control*, *plan/organize* and *task evaluation*) contributed the most to anxiety reduction, followed by improvements in emotion regulation (*acceptance of emotions* and *goal-oriented action*). These outcomes support the indication for art therapy in the treatment of anxiety and provide directions for further studying effectiveness and working mechanisms of art therapy, in order to learn about their specific indications and to support clinical practice.

The secondary aim was to study how case reports within this profession can be used in art therapy research. The developed case report guideline for AAT was positively evaluated on face validity. A case report of a female client with anxiety demonstrated that hypothesized working mechanisms from the RCT could be further connected to art therapy specific factors, and that structured art therapy assignments appeared to implicitly address and improve aspects of emotion regulation and executive functioning.

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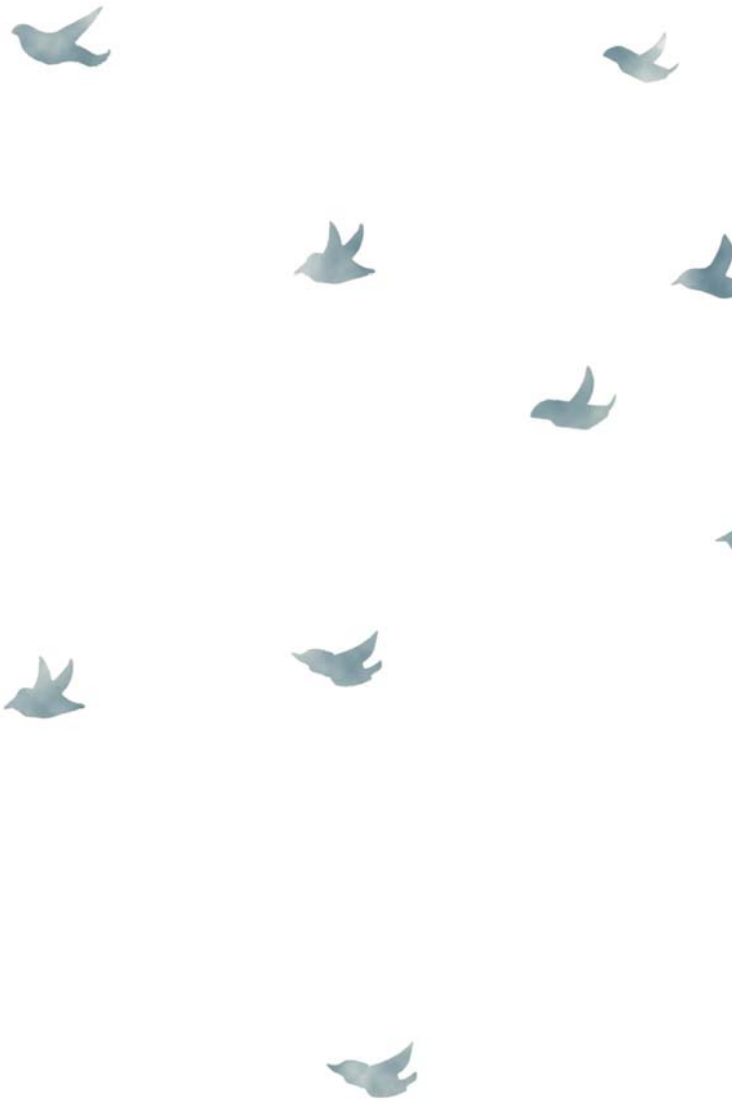


Chapter 8

Summary in Dutch

Dit proefschrift gaat over *vaktherapie beeldend op antroposofische grondslag* (VTag), ook wel bekend als kunstzinnige therapie. Het doel van dit proefschrift was te onderzoeken of kunstzinnige therapie effectief is en het exploreren van de veronderstelde werkingsmechanismen, met een focus op de behandeling van angstklachten.

De belangrijkste onderzoeksvraag was:
Is er bewijs voor de effectiviteit van beeldende therapie bij de behandeling van angst bij volwassenen en welke werkingsmechanismen van kunstzinnige therapie kunnen worden geïdentificeerd?

Vaktherapie is een vaak geboden behandelingsoptie in de geestelijke gezondheidszorg en wordt vaak geïndiceerd voor angststoornissen (Van Balkom et al., 2013). Angst is een groot probleem voor individuen in onze samenleving (Nederlands Kenniscentrum Angst en Depressie, 2019). Standaardbehandeling voor angststoornissen volgens de Nederlandse zorgstandaarden (Hassink-Franke et al., 2012), bestaande uit cognitieve gedragstherapie (CGT) en / of farmacotherapie, is effectief maar niet alle patiënten hebben er voldoende baat bij (Heldt, et al. 2003; Tyrer, Seivewright, Johnson, 2004; Linden, Zubraegel, Baer, Franke & Schlattmann, 2005; Zou, Ding, Flaherty & Dong, 2013; Pelissolo, 2008; Katzman et al., 2014). Andere benaderingen (alleen of in aanvulling op / gecombineerd met CGT en / of medicatie) kunnen succesvol zijn in specifieke subgroepen van patiënten, maar deze interventies moeten transparant, meetbaar en repliceerbaar zijn om hun effectiviteit te kunnen beoordelen.
Dit geldt ook voor kunstzinnige therapie, een vorm van vaktherapie, waarbij gewerkt wordt vanuit een holistische visie op de mens (het antroposofisch mensbeeld) en specifieke kunstzinnige oefeningen worden aangeboden waarvan wordt gedacht dat ze een 'gezondheidsbevorderende' werking hebben, door het ervaren van kleuren en vormen. Ook wordt via het kunstzinnig werken de mogelijkheid geboden om specifieke vaardigheden te oefenen en eigen gevoelens en cognities in een veilige omgeving te verkennen (NKVT, 2018; Christeller et al., 2000; Hauschka, 2004; Rolff & Gruber, 2015).
Om patiënten de best mogelijke zorg te bieden, dienen therapeuten te werken volgens de criteria van evidence based practice (EBP). EBP bestaat uit drie pijlers (Lucas, 2015). Pijler 1 (klinische expertise) en 2 (patiëntvoorkeuren) van het EBP-model worden momenteel toegepast in de kunstzinnig therapeutische praktijk: kunstzinnig therapeuten hebben KT-

specifieke kennis en vaardigheden ontwikkeld en beschreven, en hebben de kennis en vaardigheden om de behandeling aan te passen aan de individuele patiënt en zijn of haar relevante context. Pijler 3 (bewijs uit (effectiviteits)studies) ontbreekt bij de ondersteuning van de kunstzinnig therapeutische behandeling, omdat er nauwelijks bewijs is voor de effectiviteit van kunstzinnige therapie vanwege een gebrek aan onderzoek op dit gebied.
Om verantwoorde, veilige en gerechtvaardigde zorg te bieden, is het noodzakelijk om de effectiviteit van kunstzinnige therapie te evalueren en werkingsmechanismen te onderzoeken en te onderbouwen.

Voornaamste bevindingen

De studies in dit proefschrift hadden tot doel inzicht te krijgen in de effectiviteit en mogelijke werkingsmechanismen van beeldende therapie bij vrouwen met angst te onderzoeken. Het tweede doel was bij te dragen aan de ontwikkeling van het beroep van vaktherapeuten, door hen uit te rusten met hulpmiddelen voor systematische gegevensverzameling en publicatie van case reports, waarmee ze ondersteund worden in het bijdragen aan de *body of knowledge* en de *body of evidence* ten aanzien van de werkingsmechanismen van beeldende therapie.
Voor het eerste doel werden een systematic review en een randomised controlled trial (RCT) uitgevoerd. De eerste belangrijke uitkomst van de RCT is dat drie maanden kunstzinnige therapie leidde tot een significante vermindering van de ernst van angstsymptomen in vergelijking met wachtlijstconditie en tot een significante verbetering van de ervaren kwaliteit van leven. De tweede uitkomst is het effect van kunstzinnige therapie op aspecten van zelfregulatie: ervaren emotieregulatie, gemeten stressregulatie en ervaren dagelijks executief functioneren, wat aangeeft dat kunstzinnige therapie verschillende aspecten van zelfregulatie verbetert die bijdragen aan het verminderen van angstsymptomen. De hartslagvariabiliteit tijdens rust verbeterde na drie maanden kunstzinnige therapie. Er werden geen significante veranderingen gevonden in de cognitieve prestaties tijdens specifieke neuropsychologische taken met betrekking tot aspecten van het executief functioneren, maar het baseline niveau van inhibitie droeg wel bij aan de voorspelling van de behandelingseffecten. Ten derde, op basis van eerste stappen in de verkenning van werkingsmechanismen, kon hypothetisch worden gesteld dat specifieke beeldend therapeutische oefeningen tot specifieke effecten kunnen leiden. Dit werd geïllustreerd met een case report waarin werd aangeduid dat de therapie plaatsvond in een veilige en ondersteunende omgeving die ontspanning en plezier

tijdens het kunstzinnig werken mogelijk maakte, terwijl vaardigheden voor het reguleren van emoties en executief functioneren werden toegepast en verbeterd, zonder dat de angst expliciet geadresseerd werd. De beschrijving van het proces suggereert dat dit 'leerproces' onbewust (impliciet) plaatsvond en niet via bewuste processen.

Op basis van het voorgaande kunnen we concluderen dat beeldende therapie effectief kan zijn in de behandeling van angstsymptomen bij vrouwen. Belangrijke beperkingen van dit onderzoek zijn de inactive controle groep en de specifieke studiepopulatie, bestaande uit iets meer dan 50% hoger opgeleide vrouwen, waarvan wij vermoeden dat zij geïnteresseerd waren in deze vorm van behandeling en daar ook enige mate van motivatie voor hadden. Hoewel gecontroleerd is voor bekendheid met antroposofische zorg, kan niet uitgesloten worden dat de uitkomsten van het onderzoek positief zijn beïnvloed door mogelijke positieve verwachtingen van de deelnemers. Op basis van dit onderzoek is enig inzicht gekregen in mogelijke werkingsmechanismen van beeldende therapie, maar er zijn nog vele factoren die om nader onderzoek vragen, voordat er uitspraken gedaan kunnen worden over exacte werkingsmechanismen.

Implicaties voor de klinische praktijk

De in dit proefschrift beschreven studies hebben bijgedragen aan alle niveaus van de effectladder (Van Yperen & Veerman, 2008), die wordt gebruikt om het gerapporteerde bewijs van de effectiviteit van een interventie te beoordelen.

Het case report (hoofdstuk 6) gaf een gedetailleerde beschrijving van de interventie (niveau 1) en er werd een interventietheorie onderzocht (niveau 2). De RCT (hoofdstukken 3 en 4) verschafte eerste uitkomsten van effectmaten (niveau 3) en betrof vergelijkend onderzoek (niveau 4), met de conclusie dat volgens de effectladder kunstzinnige therapie beschouwd kan worden als een bewezen effectieve interventie. Daarbij is wel van belang dat uitkomsten gerepliceerd dienen te worden in toekomstig onderzoek.

Door voorspellers van behandelsucces te analyseren, kunnen we aangeven voor welke mensen de behandeling effectief kan zijn. Op basis van onze bevindingen lieten personen met de volgende kenmerken een grotere angstreductie zien: hoge mate van ernst van angstsymptomen op baseline, meer problemen met emotieregulatie, problemen in cognitieve flexibiliteit en ordelijkheid, en op gebied van cognitieve prestaties: slechtere baseline-inhibitiescores.

Volgens cliënten met angst is de therapie succesvol. Niet alle cliënten hebben echter baat gehad bij de therapie. Bijna 16% van de deelnemers (7 van de 44) vertoonde geen vermindering van angstsymptomen direct na de therapie, hoewel de kwaliteit van leven in al deze zeven gevallen wel verbeterde. Drie van deze participanten maakten deel uit van de eerste behandelingsgroep die direct na de therapie werd geëvalueerd en verrassend genoeg vertoonden deze participanten wel angstreductie bij follow-up, drie maanden na de therapie. De resterende vier participanten die niet direct na therapie verbeterden, maakten deel uit van de tweede behandelingsgroep, die geen follow-up meting had.

Hoewel niet alle deelnemers angstreductie lieten zien direct na afloop van de therapieperiode, was de therapie op groepsniveau effectief en is het een toegankelijke therapie (met uiteraard wel een financiële en tijdinvestering), zonder (te verwachten) bijwerkingen. De resultaten van ons onderzoek geven aan dat beeldende therapie kan worden voortgezet als een behandelingsoptie bij angststoornissen. Het kan mogelijk ook geschikt zijn voor personen die geen of weinig baat hebben bij CGT, of voor personen die een ervaringsgerichte therapie verkiezen boven een cognitieve therapie. Het kan ook dienen als een aanvullende therapie naast CGT en / of medicatie, of kan worden geïntegreerd met CGT. Hoe dit in de klinische praktijk georganiseerd zou kunnen worden, is iets dat in de toekomst moet worden onderzocht.

Kunstzinnige therapie heeft een andere dynamiek dan verbale therapie. Gemeenschappelijk voor de meeste vormen van therapie voor angst is dat alternatieve strategieën worden geleerd om met angstige situaties om te gaan. Een van de belangrijkste verschillen tussen cognitieve therapieën en non-verbale therapieën is het niveau van ‘bewustzijn’ van het proces van de cliënt en de mate van bespreken van dit proces met de cliënt.

Piekeren en rumineren zijn vaak aanwezig bij mensen met angst (American Psychiatric Association, 2013), wat kunstzinnig therapeuten karakteriseren als ‘een dominantie van overmatig en onproductief denken’ wat in therapie zou moeten worden verminderd. Volgens Borkovec (1994) (geciteerd in Dar & Iqbal, 2014) interfereert piekeren en verbale activiteit met emotionele verwerking en kan het adaptieve coping bij personen met angstgevoelens tegenwerken. Het case report illustreerde dat bij kunstzinnig therapeutische behandeling de angst niet 'bewust' of cognitief wordt geadresseerd en (overmatig) praten over de angst wordt vermeden, om het individu niet in staat te stellen 'in de denkmodus te blijven' en piekeren en rumineren in stand wordt gehouden. Het is bekend dat piekeren en rumineren in grotere mate

aanwezig zijn bij personen met een hoge intelligentie, wat ook gezien wordt als een risicofactor voor angst en andere psychische stoornissen (Karpinski, Kinase Kolb, Tetreault, & Borowski, 2018). Het merendeel van onze studiepopulatie heeft hoger onderwijs genoten, wat erop kan duiden dat onze studiepopulatie een hoger gemiddeld intelligentieniveau heeft dan de gemiddelde Nederlandse bevolking. De deelnemers stonden open om een andere, niet-cognitieve aanpak te proberen. De therapie vereist eigen activiteit en commitment, kan de aandacht afleiden van beperkende overtuigingen en cognities en beoogt de aandacht te richten op het creatieve proces, waardoor de persoon zich focust op zelfexpressie, exploratie van emoties en kan toewerken naar acceptatie. Het creëren van een visueel werk kan een zekere afstand bieden, zodat patiënten niet worden overweldigd door angstgevoelens (Van Balkom et al., 2013). Er wordt verondersteld dat het afstand doen van de emotie tijdens het maken van kunst de cognitieve regulatie van emoties verbetert (Smeijsters, 2008). Beeldende therapie wordt vanwege het non-verbale karakter ook geschikt geacht voor minder 'cognitief georiënteerde' personen, of personen die moeite hebben zich verbaal uit te drukken. Kunstzinnige oefeningen kunnen het individu helpen zich uit te drukken, kunnen een weerspiegeling zijn van emoties en het welzijn van het individu kan worden ondersteund door meer therapeutische opties dan therapeutische methoden die afhankelijk zijn van verbale kwaliteiten (bijv. Liebman, 1990; Chambala, 2008; Haeyen , 2007).

Conclusies

Dit proefschrift is gericht op een van de interventies die vaak wordt toegepast in de behandeling van angst, maar tot op heden weinig is onderzocht: vaktherapie beeldend, en kunstzinnige therapie in het bijzonder.

Het primaire doel was om de effectiviteit van beeldende therapie bij de behandeling van angst te onderzoeken en de werkingsmechanismen ervan te exploreren in een systematic review en een gerandomiseerde gecontroleerde trial (RCT). De systematic review van (R)CTs naar beeldende therapie voor angst bij volwassenen toonde aan dat de effectiviteit van beeldende therapie bij angst nauwelijks is onderzocht. Uitkomsten van de uitgevoerde RCT toonden voorlopig bewijs van de effectiviteit van kunstzinnige therapie bij de behandeling van angst.

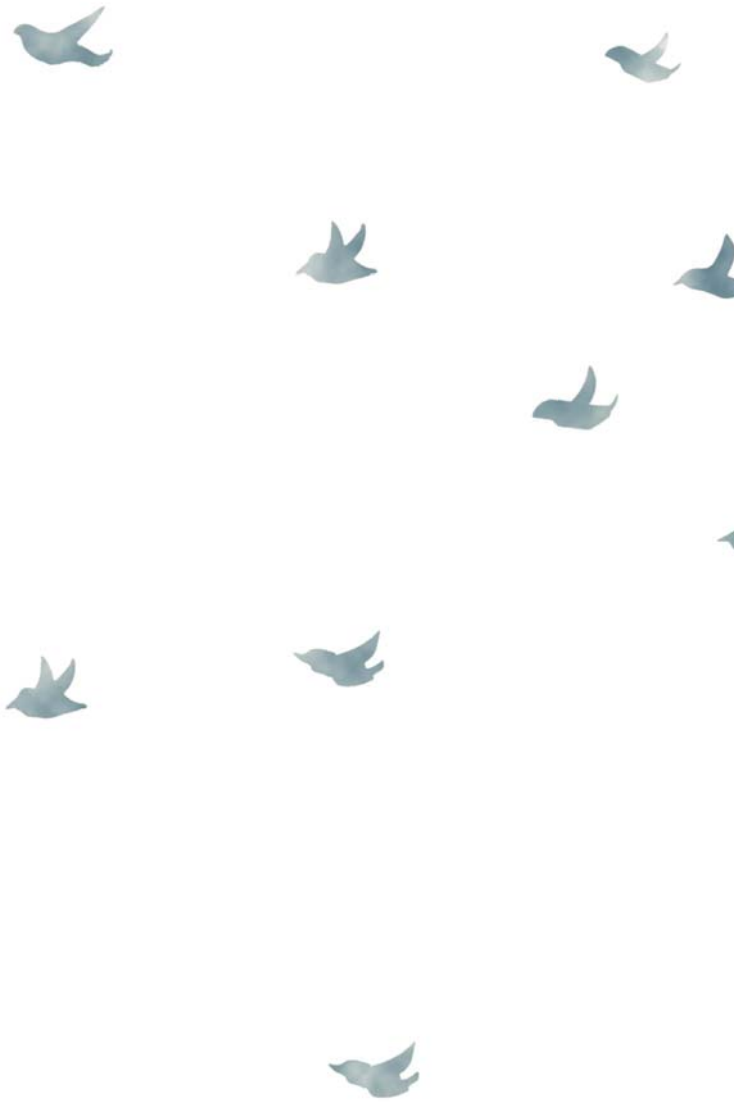
De behandeling, bestaande uit drie maanden kunstzinnige therapie, liet grote effecten zien op de vermindering van de ernst van angstsymptomen bij vrouwen. De therapie verbeterde eveneens de kwaliteit van leven en verschillende aspecten van zelfregulatie: 10-12 sessies leidden tot een hogere HRV in rust (hartslagvariabiliteit), verbeterde toegang tot emotieregulatie strategieën en verbeteringen in het dagelijks executief functioneren. Verbeteringen in executieve functies (domeinen emotiebeheersing, plannen/organiseren en taakevaluatie) droegen het meest bij aan de angstvermindering, gevolgd door verbeteringen in emotieregulatie (acceptatie van emoties en verbeterde doelgerichte actie). Deze uitkomsten ondersteunen de indicatie voor beeldende therapie bij de behandeling van angst en geven aanwijzingen voor het verder bestuderen van de effectiviteit en werkingsmechanismen van kunstzinnige therapie, om de specifieke indicaties duidelijker te kunnen stellen en de klinische praktijk te ondersteunen.

Het tweede doel was te onderzoeken hoe case studies kunnen worden gebruikt in onderzoek naar kunstzinnige therapie. De ontwikkelde richtlijn voor case reports werd positief beoordeeld op gezichtsvaliditeit. Een case report van een vrouwelijke cliënt met angst liet zien dat gehypothetiseerde werkingsmechanismen uit de RCT verder in verband konden worden gebracht met therapie specifieke factoren, en dat via gestructureerde kunstinnige oefeningen aspecten van emotieregulatie en executief functioneren impliciet werden geadresseerd en verbeterd.

8

“What would life be if we didn’t have the courage to try something?”

(Vincent van Gogh)



About the author

Curriculum Vitae

Annemarie Madani-Abbing was born on 3 March 1979 in Leerdam. She obtained her pre-university degree (VWO) in 1997 in Noordwijk and studied anthroposophic art therapy at the University of Applied Sciences in Leiden. She graduated in 2001 and continued her scientific education at Utrecht University where she studied Veterinary Medicine. During her studies, she worked as a veterinary analyst in Rotterdam Zoo (Diergaarde Blijdorp). She obtained her doctoral degree in 2005, with a specialization in large animals and veterinary public health.

From 2005, Annemarie has joined the Ministry of Agriculture, Nature and Food Quality as a research coordinator. After a short professional break to raise her young family, she was involved in organization of and fundraising for art projects in schools for special secondary education (cluster 4).

She obtained a position as fundraiser and project developer at the Professorship Anthroposophic Healthcare (PAH) at the University of Applied Sciences (UAS) Leiden in 2010. Soon she started to work on research projects as well. After exploring the possibilities for a PhD project, and the birth of her third child, she started her part time PhD research project in 2013. She joined the Dual PhD Centre (The Hague/Leiden) in 2016 as a dual PhD student and proceeded with her research under supervision of Prof. Dr. Hanna Swaab at Leiden University from mid-2016 onwards. Annemarie combined her PhD research (0,4 fte) with fundraising / grant application for the PAH, until mid-2018, and a three-year course Classical Singing at the Royal Conservatory in The Hague, where she graduated in June 2019 (cum laude). She is a soprano at Residentie Kamerkoor in The Hague.

Since the beginning of 2019, Annemarie is lecturer in Art Therapy research at the Faculty of Health of the UAS Leiden. Annemarie holds a temporary postdoc position in the Arts Therapies at the Open University under supervision of Prof. Dr. Susan van Hooren, since November 2019. She will also continue her research on art therapy and anxiety at the UAS Leiden.

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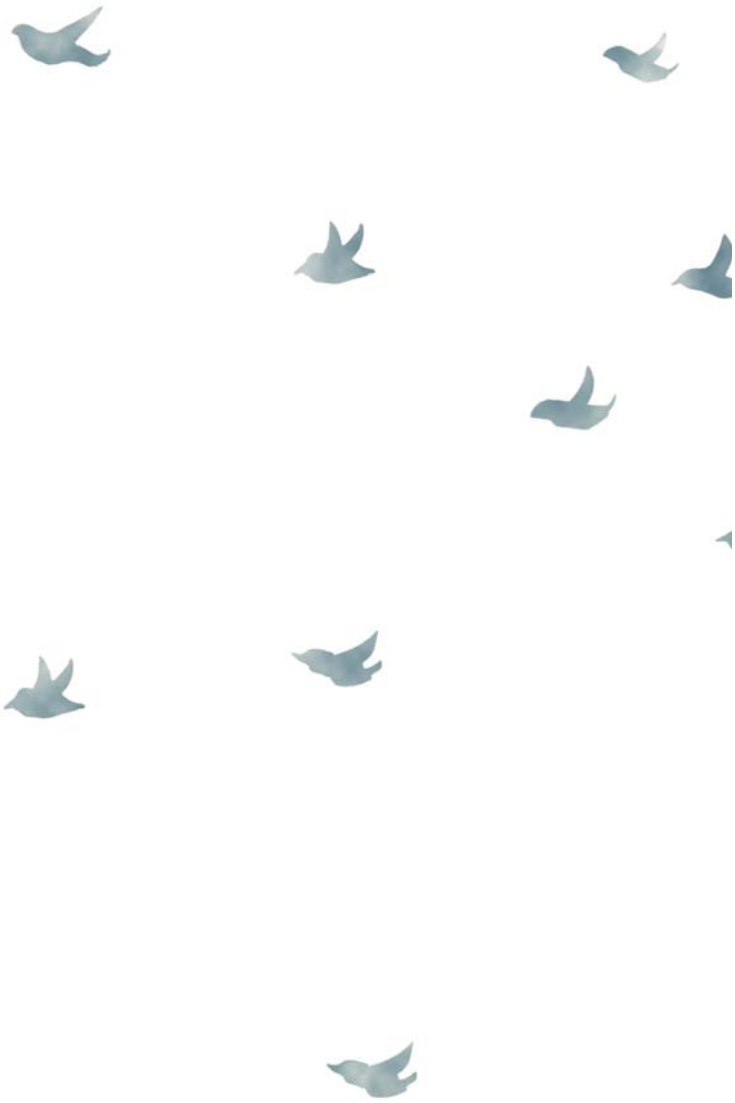
‘Without great solitude no serious work is possible’

(Pablo Picasso)



Dankwoord

Hoewel enige mate van eenzaamheid inherent is aan het schrijven van een proefschrift, was dit proefschrift er absoluut niet geweest zonder de betrokkenheid en steun van diverse mensen.

Allereerst wil ik alle therapeuten en cliënten die hebben meegewerkt aan de onderzoeken heel hartelijk danken voor hun deelname en hun openheid. Dit heeft ons zoveel waardevolle informatie verschaft.

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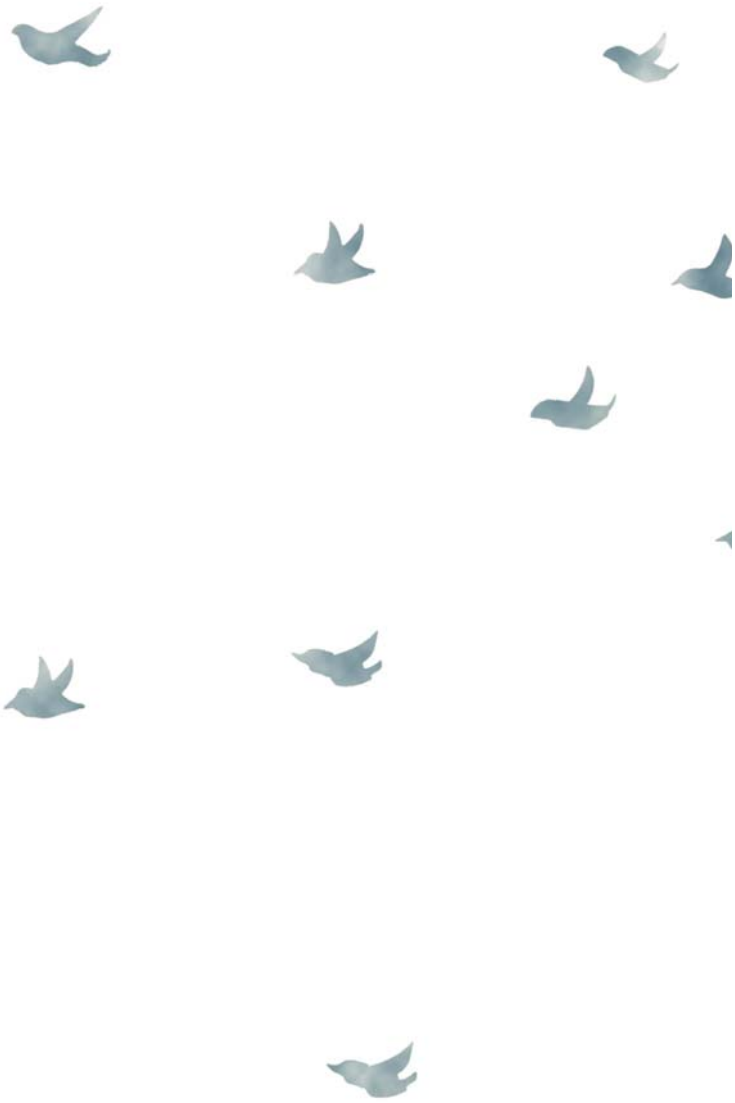

Nawoord

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