RESEARCH ARTICLE

Expressive Writing and Eating Disorder Features: A Preliminary Trial in a Student Sample of the Impact of Three Writing Tasks on Eating Disorder Symptoms and Associated Cognitive, Affective and Interpersonal Factors

Philippa East[1]*, Helen Startup[1], Clifford Roberts[2] & Ulrike Schmidt[3]

[1]South London and Maudsley NHS Trust, London, UK

[2]London South Bank University, Institute of Strategic Development and Practice Innovation, London, UK

[3]Institute of Psychiatry, Section of Eating Disorders, UK

Abstract

Objective: To evaluate the impact of three writing tasks on the cognitive, affective and interpersonal factors typically associated with eating disorder symptoms, in a student population.

Method: Two experimental tasks and one control task were evaluated. Participants gave subjective ratings of the writing experience, and objective questionnaire measures were administered at baseline, and 4- and 8-week follow-up.

Results: Participants who dropped out without completing the writing tasks were more experientially avoidant. The three tasks differed significantly in subjective impact, and the experimental tasks were most effective in reducing eating disorder symptoms. They also ameliorated some key features associated with eating difficulties. The control task generally had less, no or a detrimental effect.

Conclusion: The results provide preliminary indirect support for the use of therapeutic writing to address specific features associated with the eating disorder presentation. Further research is required to replicate the present findings and extend these to the clinical population. Copyright © 2010 John Wiley & Sons, Ltd and Eating Disorders Association.

The treatment of anorexia nervosa (AN) continues to present a significant clinical challenge (Schmidt & Treasure, 2006) and the lack of effective interventions means that there is a need for new treatments. One novel approach involves the use of the expressive writing techniques pioneered by James Pennebaker (Pennebaker & Beall, 1986). Over the last two decades, many studies in diverse populations have shown that people who write about emotionally significant experiences for 15–20 minutes per day over consecutive days demonstrate a range of physiological and psychosocial benefits (Pennebaker & Graybeal, 2001).

These include improved immune function (Pennebaker, Kiecolt-Glaser, & Glaser, 1988), better college grades (Pennebaker, Colder, & Sharpe, 1990), shorter time to re-employment (Spera, Buhrfeind, & Pennebaker, 1994), increased working memory capacity (Klein & Boals, 2001), and improved affect (Greenberg, Wortman, & Stone, 1996). A meta-analytic review of studies on healthy participants found a significant mean weighted effect size of $d = 0.47$ across all studies and outcome variables (Smyth, 1998). The greatest benefits were observed for measures of physiological functioning ($d = 0.68$) and psychological well-being ($d = 0.66$), followed by reported physical health ($d = 0.42$) and general functioning ($d = 0.33$).

More recently, expressive writing approaches have been applied in clinical settings. For example, breast-cancer patients who engaged in expressive writing reported improved coping, fewer cancer-related physical problems and fewer visits to their doctors than those asked to write factually about cancer (Stanton et al., 2002). Asthmatic individuals reported improved lung function following writing (Smyth, Stone, Hurewitz, & Kaell, 1999), while HIV patients showed an improved immune response comparable to that seen with anti-HIV drug therapy (Petrie, Fontanilla, Thomas, Booth, & Pennebaker, 2004). The benefits of the writing paradigm have also been explored in psychiatric populations. For example, patients recovering from psychosis who wrote about their illness and treatment had less overall severity and avoidance of traumatic symptoms when compared with patients who did not write about their psychotic experiences (Bernard, Jackson, & Jones, 2006). A meta-analysis of nine expressive writing studies involving psychiatric or physically ill participants reported a mean weighted effect size of $d = 0.19$ across all studies and outcomes (Frisina, Borod, & Lepore, 2004).

More recent studies have also explored the mechanisms of change in expressive writing, specifically looking at changes in the style and content of participants' writings across sessions. In one such study, Campbell and Pennebaker (2003) report an unexpected association between flexibility of pronoun use and health benefits. Specifically, 'the more people changed their writing styles, the more their health improved... Closer analyses... indicated that particles, and in particular pronouns, predicted the health changes' (p. 64). The authors further suggest that 'Pronoun use is based on perspective' (p.64), with the

implication that the development of different interpersonal viewpoints may be a key mechanism in the process of therapeutic change. The authors speculate that adopting different perspectives may encourage the individual to view himself in relation to others, a process which may be an important part of coming to terms with trauma and upheaval.

There are a number of theoretical reasons to suggest that therapeutic writing might be particularly relevant to eating disorders. As part of their model of AN, Schmidt and Treasure (2006) emphasise the role that the cognitive, affective and interpersonal aspects of AN may play in maintaining the disorder. They further argue that therapeutic approaches which target these features may be useful (Treasure, Tchanturia, & Schmidt, 2005), and describe how writing tasks might fulfil this role (Schmidt, Bone, Hems, Lessem, & Treasure, 2002). For example, individuals with AN typically are unwilling to verbally express their emotions, needs and experiences, especially when these may result in interpersonal loss or discord (Geller, Cockell, Hewitt, Goldner, & Flett, 2000). Pennebaker himself suggests that expressive writing may exert its beneficial effects by enabling individuals to 'disinhibit' their thoughts and emotions (Pennebaker, 1989). Individuals with AN have also been found to be experientially avoidant, working to suppress or avoid distressing affect or personal experiences (Hambrook et al., submitted). It has been suggested that the expressive writing paradigm allows and promotes exposure to previously avoided thoughts, memories and emotions (Lepore, Greenberg, Bruno, & Smyth, 2002). Expressive writing would therefore seem to be particularly helpful for individuals with AN. Additionally, as noted above, it has been proposed that expressive writing encourages cognitive change and flexibility (Campbell & Pennebaker, 2003). Individuals with AN often have a very black and white, rigid thinking style and interventions which directly address this deficit may therefore be of particular benefit (Tchanturia et al., 2004). Finally, structured writing tasks can allow the patient to reflect on events, experiences and relationships from a variety of different angles (Campbell & Pennebaker, 2003). Theory of mind deficits have been reported in AN (Tchanturia, Happe, Godley, Treasure, Bara-Carril, & Schmidt, 2004) and writing tasks which promote interpersonal perspective-taking may be an important tool in addressing this aspect of the disorder.

Writing tasks have already been incorporated into the treatment of eating disorders, for example, in the form of motivational exercises in which the patient writes to the eating disorder as a 'friend' and as an 'enemy' (Schmidt & Treasure, 1993; Treasure, 1997). To date, there are also a small number of research studies suggesting that structured writing tasks can have a beneficial impact on various aspects of eating disorder symtomatology, including negative body image (Earnhardt, Martz, Ballard, & Curtin, 2002), bulimic symptoms (Frayne & Wade, 2006), thin-ideal internalisation (Stice, Shaw, Burton, & Wade, 2006), and eating disorder diagnosis (Robinson & Sefarty, 2008). The theoretical considerations outlined above suggest that expressive writing may particularly influence the cognitive, affective and interpersonal features associated with disordered eating, and a treatment programme which explicitly incorporates Pennebaker-style writing tasks has recently been developed (The Maudsley Eating Disorders Team, unpublished manual).

The objective of the present study was to experimentally isolate and evaluate this novel therapeutic approach. Specifically, the aim was to investigate the differential impact of two experimental and one control task on symptoms of disordered eating, mood and on postulated cognitive, affective and interpersonal maintaining factors. The study also aimed to evaluate the subjective impact and appeal of these tasks.

This preliminary study focussed on a non-clinical sample due in part to the significant difficulties in recruiting and retaining individuals with AN (Bulik, Berkman, Brownley, Sedway, & Lohr, 2007). Additionally, the specific tasks and outcomes adopted for the present study have not been previously researched, and it was therefore important to test the palatability and effectiveness of such tasks initially in a non-clinical sample. However, it was nonetheless hoped that the selected (predominantly female) sample would display meaningful variability in terms of eating difficulties, and, on the basis of dimensional conceptualisations of eating disorder pathology (Williamson, Gleaves, & Stewart, 2005) still usefully inform clinical models. Furthermore, this non-clinical sample was also expected to display variability in terms of factors such as cognitive rigidity and experiential avoidance, which are equally important targets for intervention (Treasure, Tchanturia, & Schmidt, 2005).

The standard Pennebaker task was used in the present study, to further evaluate the effectiveness of this well-established task when applied to the domain of eating disorders. Additionally, drawing on the findings of Campbell and Pennebaker (2003) regarding alternative viewpoints, and on evidence for deficits in AN in both cognitive flexibility and theory of mind (Tchanturia et al., 2004; Tchanturia et al., 2004), a newly-developed perspective-shift task was also evaluated.

Methods

Ethical review

Ethical approval was granted by the Research Ethics committees of Kings College London and London South Bank University.

Participant recruitment

Participants were recruited from students of the BSc course in Professional Nursing Practice at London South Bank University. This population was chosen due to ease of recruitment and retention, and because there was a preponderance of female students in this group. It was expected that while these students might be relatively asymptomatic in terms of eating disorder features, they would still display meaningful variation in their scores on dimensions such as cognitive flexibility and self-expression. There were no exclusion criteria.

An introductory talk about the study which was given to the students on one of their lecture days. The application of expressive writing to various clinical conditions was presented as a general background to the study. To avoid biasing participants, the study was described as a formal evaluation of the use of expressive writing in these general contexts, exploring the impact of writing on interpersonal functioning, mood, attitudes towards weight and shape, and thinking styles. Participants did not have prior knowledge of the expected impact of the different tasks, and were therefore blind to intervention status and to the specific hypotheses of the study.

Power calculation

No previous study has specifically compared the three writing tasks used in the present exploratory trial, though Smyth's (1998) meta-analysis of writing studies with healthy participants reports an overall pre- to post-intervention effect size of $d = 0.66$ for psychological well-being outcomes. A power calculation was

conducted for the overall pre- to post- difference for any individual writing task, using Smyth's reported statistic. The NQuery paired samples *t*-test formula was used, set with 80% power and an alpha coefficient of .05. This indicated that 20 participants would be required to detect an overall outcome effect of this size. As the present study comprised three conditions, a total of 60 participants would therefore allow detection of effects of this magnitude within each treatment group.

Measures

A set of six validated research questionnaires was used to assess the study's variables of interest.

Eating disorder symptoms

The eating disorder examination—self-report version (EDE-Q; Fairburn & Beglin, 1994) is based on the EDE diagnostic interview schedule (EDE; Fairburn & Cooper, 1993). This self-report questionnaire gives a comprehensive assessment of specific behavioural and attitudinal eating disorder symptoms over the past 28 days. The questionnaire comprises four subscales of restraint, eating concern, weight concern and shape concern, and derives a total score measuring overall level of disturbance. The questionnaire has good psychometric properties (Fairburn and Beglin, 1994; Mond, Hay, Rodgers, Owen, & Beumont, 2004). The latest 28-item version (version 5.2) was used in the present study, and the overall score was used as a measure of eating disorder symptoms.

Mood

The hospital anxiety and depression scale (HADS; Zigmond & Snaith, 1983) is a 14-item self-screening questionnaire for depression and anxiety (subscales). The scale has good basic psychometric properties, with the internal consistency of its subscales being 0.80 and 0.76, respectively (Mykletun, Stordal, & Dahl, 2001). While initially developed for use in general medical outpatient clinics, normative data have also been established within the non-clinical population (Crawford, Henry, Crombie, & Taylor, 2001).

Inhibited self-expression

The silencing the self-scale (STSS; Jack & Dill, 1992) is a 24-item self-report questionnaire of inter- and intra-personal functioning, comprising four rationally-

derived subscales: 'Externalised self-perception' reflects the tendency to judge the self according to others' standards; 'care as self-sacrifice' reflects the tendency to secure relationships by putting others' needs before one's own; 'silencing the self' reflects the inhibition of self-expression and action to avoid interpersonal conflict or loss; and 'divided self' reflects the presentation of an outer compliant self underlain by an angry and hostile inner self. The scale has good test–retest reliability, internal consistency and construct validity (Jack & Dill, 1992). In the present study, the total questionnaire score was used as an overall measure of inhibited self-expression.

Experiential avoidance

The action and acceptance qestionnaire (AAQ; Hayes et al., 2004) is a uni-dimensional self-report measure of experiential avoidance, developed from the practice of acceptance and commitment therapy (ACT). The scale has good validity and reasonable reliability. A second version of the questionnaire, the AAQ-II, was recently developed to improve the reliability of the questionnaire, and this revised version was used in the present study.

Cognitive and emotional empathy

The interpersonal reactivity index (IRI; Davis, 1980) is a 28-item self-report questionnaire that measures a person's general capacity for cognitive and emotional empathy using four subscales. The perspective-taking (PT) subscale assesses a person's tendency to see things from the point of view of others, without necessarily experiencing any affective involvement. The Fantasy (FS) subscale assesses a person's identification with fictional characters in books or films. The empathic concern (EC) subscale assesses a person's tendency to experience the affective reactions of sympathy, concern and compassion for other people undergoing negative experiences. The personal distress (PD) subscale assesses the tendency to experience subjective distress and discomfort when witnessing other people's negative experiences. Each scale reliably measures the identified variable and has adequate internal reliability, with an alpha coefficient ranging from .71 to .77 (Davis, 1983; Litvack-Miller, McDougall, & Romney, 1997). In the present study, the perspective-taking subscale was taken as a measure of cognitive empathy and the empathic

concern subscale was taken as a measure of emotional empathy.

Cognitive rigidity

The cognitive flexibility scale (CFS; Martin & Rubin, 1995) is a uni-dimensional, 12-item self-report questionnaire which measures three components of cognitive flexibility: Awareness of options and alternatives, willingness to be flexible and adaptable and self-efficacy in being flexible. The CFS has good validity and reliability, with an alpha coefficient of .72 (Martin & Anderson, 1998).

Subjective ratings

At the end of each day's writing session, participants completed five 'strongly agree-strongly disagree' visual analogue scales (VAS) indicating how *meaningful, emotional, upsetting*, *difficult* and *enjoyable* they found the day's task. Similar measures have been used in previous studies (e.g. Pennebaker et al., 1988; King, 2001; Kovac & Range, 2002), to establish the extent to which participants engaged with the task. In the present study, these scales also provided important information on the subjective impact and appeal of the writing exercises.

Content of writing tasks

The first experimental condition was based on the standard Pennebaker task (Pennebaker, 1997), which instructs participants to write freely about their deepest thoughts and emotions regarding a difficult or stressful life event. The second experimental task was designed to explicitly elicit shifts in perspective across writing sessions (Box 1) and was developed specifically for the present study. The task was based on the perspective-taking exercises from Pennebaker's self-help book (Pennebaker, 2004) used in the Maudsley programme. Participants in the control condition were asked to write about superficial topics, in a factual manner, without exploring thoughts and feelings. Such control tasks have been used in many previous studies (e.g. Sheffield, Duncan, Thomson, & Johal, 2002; Kovac & Range, 2002; Bernard, Jackson, & Jones, 2006). As a rationale for this control task, participants are told that it can be helpful to distract oneself from thinking about current stressful events or situations.

Instructions for experimental condition 2: Perspective-shift

Day 1: To complete today's writing activity, please think of a current or recent difficult experience in your life. This should be an event or situation that presently causes you some difficulty, stress or upset, or that continues to impact on your life in some way. For example, you may like to write about your experiences of starting your course, a recent upheaval such as moving house, or a present difficult relationship with a friend or family member. Whatever you choose to write about, it is important that this is something personally and emotionally significant to you. Today, we would like you to write about this topic for 20 minutes, exclusively from YOUR OWN perspective. Think specifically about how the event or situation made YOU feel, how YOU reacted and what impact this event has on YOUR life. When writing try to really let go and explore your deepest emotions and thoughts in relation to this event.

Day 2: To complete today's writing activity, please think again about the difficult experience in your life that you were writing about yesterday. For today's 20 minutes, we would like you to write further about this topic, this time exclusively from the perspective of SOMEONE ELSE closely involved in this event or situation. How might THEY view your own role in this event or situation? Consider how the event or situation might have made THEM feel, how THEY reacted and what impact this event might be having on THEIR life. In your writing today, really try to put yourself in the mind of the other person, and explore the thoughts and feelings they may have had.

Day 3: To complete the final day's writing activity, please think again about the difficult experience in your life that you were writing about on the previous 2 days. For today's 20 minutes, we would like you to write further about this topic, this time from a BIG PICTURE perspective, taking an objective, 'bird's eye' view. Think about how an

> OUTSIDER might describe what happened. What would this OUTSIDER say about how you and others felt and reacted, and about how it is affecting all of you now? Consider what overall meaning and value this event has. How do your thoughts and feelings in relation to this event fit into 'the grand scheme of things'?

Participants were asked to write by hand rather than using a computer, and advised to write continuously, without worrying about structure, spelling or grammar. Further instructions asked participants to write at a similar time each day, and to ensure they were not distracted or disturbed during their writing session. Participants were also encouraged to complete their writing even if feeling upset, rather than waiting until they felt calmer. However, they were advised to move on to another topic if they felt overly distressed during their writing assignment.

Procedure

Students completed the set of six questionnaires at baseline. They were then randomized to one of the three writing conditions using a random numbers generator (Urbaniak & Plous, 1997), with the researchers blind to allocation. Each participant received a writing pack for their allocated condition, which included specific writing instructions and relevant measures, as well as details of services which participants could contact should they feel overly-distressed while writing.

Participants completed three 20 minute sessions of writing at home, over consecutive days in the next week. Directly after each writing session, participants completed visual analogue scales measuring the subjective impact of the writing. After the final writing session, they also completed the HADS. This was to explore the suggestion that expressive writing may produce short-term increases in emotional distress, while providing benefits in the longer term (Pennebaker, 1989; Smyth, 1998).

The questionnaire measures were re-administered at 4- and 8-week follow-up. These follow-up time periods were in keeping with those employed in previous studies (e.g. Greenberg & Stone, 1992), and were designed to allow relatively complex changes to take place, as well as to capture more transient benefits of

writing. At 4-week follow-up participants were also asked to hand in their completed writing scripts, essay-evaluation scales and day-three HADS. However, participants were advised that they need not hand in their writings if they did not feel comfortable disclosing the specific content of their scripts. Participants were debriefed at the 8-week follow-up, and those who had completed the study in full were reimbursed £20.

Statistical analyses

Appropriate parametric or non-parametric tests were used for each analysis. Where necessary, the data were first explored to ensure they met the assumptions of the test, including normality of distribution, outliers and homogeneity of variance. Where these assumptions were violated, the data were corrected as far as possible using transformations, and any significant results were followed up using non-parametric procedures. Specifically, EDE-Q and STSS data were corrected using logarithmic transformations, AAQ data were corrected using a square root transformation, and IRI data were corrected using the inverse square root transformation. These analyses were verified using non-parametric Kruskall-Wallis tests. Where there were significant outliers, analyses were run with and without the data points to check whether they influenced the results. Where relevant, Mauchly's test for sphericity was run, and the Greenhouse-Geisser degrees of freedom and significance statistic are reported where this assumption was violated. Given the small sample, mixed-design ANOVA *post hoc* tests were conducted using the Sidak procedure to minimise loss of power. For one-way ANOVAs, *post hoc* test were conducted using the Hochberg's GT2 procedure due to the inequality of the sample sizes (Field, 2005).

Differences between completers and non-completers were evaluated using *t*-tests or Mann–Whitney tests. Mixed-design ANOVAs were used to explore differences in participants' subjective VAS ratings by group and across writing sessions. A one-way ANOVA was used to explore short-term impact on mood. Further analyses were conducted only for those participants who completed all follow-ups. One-way ANOVAs or Kruskall-Wallis tests were first used to check for differences between the three groups at baseline. Changes in questionnaire scores from baseline to 4- and 8-week follow-up were analysed using both mixed design ANOVAs and effect size calculations.

Results

Participation and attrition rates

In total, 126 students were invited to take part, of which 48 consented to the study. Participants were aged between 23 and 48, with a mean age of 32.9 years ($SD = 6.4$). Ten participants were male (20.8%), giving a male:female ratio of approximately 1:4. Participants represented a variety of ethnic backgrounds, with the most common ethnicity being White British, accounting for a quarter of participants. Eleven participants dropped out after completing only the baseline questionnaires (non-completers). Thirty-four of the

remaining participants completed the 4-week follow-up questionnaires, and 24 went on to complete the questionnaires at 8-week follow-up. Additionally, three participants who had been absent from the 4-week follow-up returned to complete the 8-week questionnaires.

At the 4-week follow-up, 28 participants handed in their completed writing scripts (76% of those who completed follow-ups; 58% of total). It was assumed that the remainder of participants also completed their writing tasks but did not hand them in; however this was not possible to fully verify. All but one of those participants who handed in writings had also
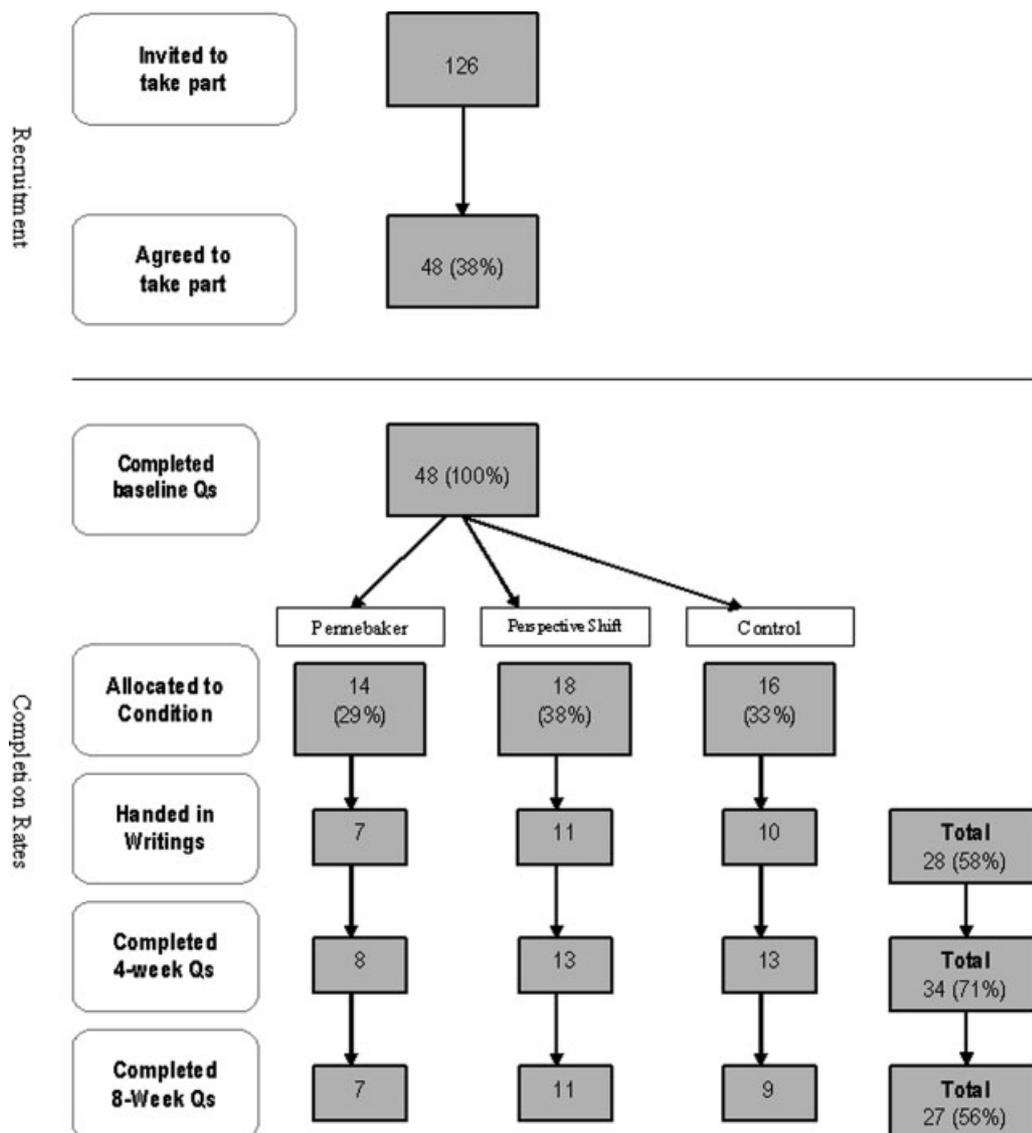

Figure 1 Consort diagram showing recruitment and participation rates

completed the evaluation scales on all 3 days, and all but four had completed their day-three HADS questionnaire. Participants' writing scripts were examined to ensure that participants had followed their task instructions correctly. This revealed that two participants in the control condition appeared to have misunderstood the task instructions, as the topics they stated and the content of their writing scripts indicated that they had written subjectively about an emotional issue. As these participants did not adhere to the control intervention, their data were considered invalid and they were excluded from the study, leaving a remainder of 22 participants that had completed the study in full. Kruskall-Wallis tests indicated that there were no significant differences between the three groups in terms of the number of non-completers ($\chi^2_{(2)} = 1.815$, $p = .404$) or of those not handing in writing ($\chi^2_{(2)} = 0.560$, $p = .756$).

Differences between completers and non-completers

T-tests or Mann–Whitney tests indicated a significant difference between the completers and non-completers on their baseline scores on the AAQ-II ($t_{(46)} = 2.04$,

$p = .048$). The mean scores showed that students who did not complete the writing tasks or any follow-up questionnaires scored higher on experiential avoidance than those who completed one or both of the follow-ups. There were no other significant differences between completers and non-completers.

Subjective impact and appeal of writing tasks

Participants' visual analogue scale (VAS) ratings of the writing experience were analysed to explore the subjective impact and appeal of the three writing tasks, in terms of how 'meaningful', 'emotional', 'upsetting', 'difficult' and 'enjoyable' participants found them. Mixed-design ANOVAs were used to compare participants' ratings of the writing tasks across the three sessions and by writing condition. Full and valid VAS data were available from 25 participants, who had completed either the Pennebaker ($N = 6$), perspective-shift ($N = 11$), or control ($N = 8$) writing task.

In terms of how meaningful the tasks were (Figure 2a), the ANOVA showed a main effect for condition ($F_{(2,22)} = 12.328$, $p < .001$). *Post hoc* pairwise tests revealed that participants in both the Pennebaker
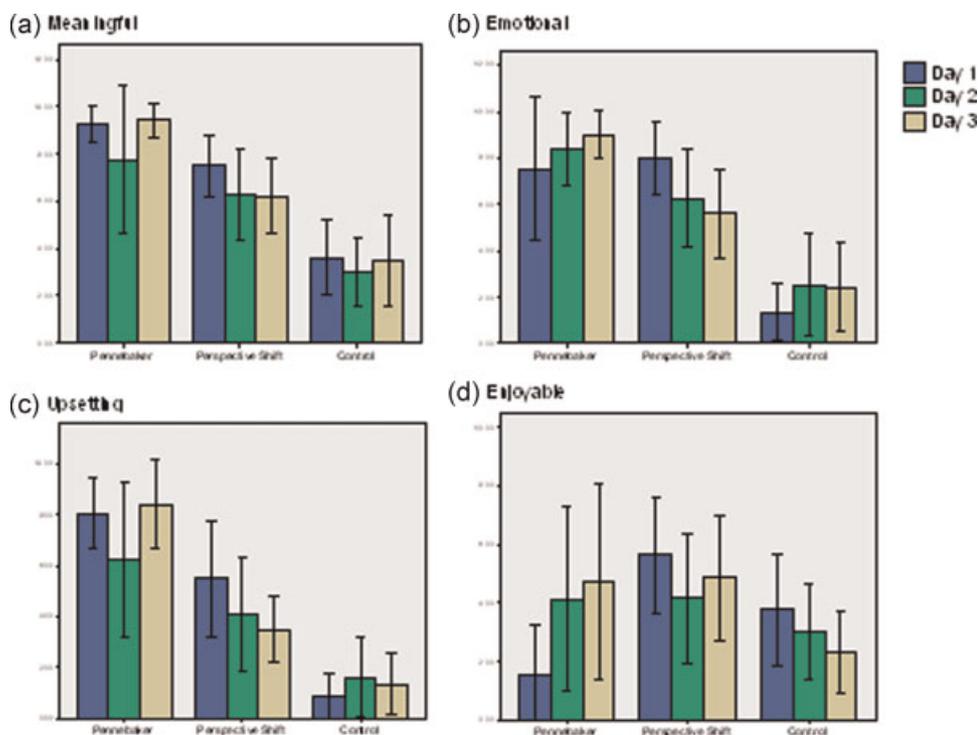
Figure 2 Significant differences in subjective ratings by group and across writing session

($p < .001$) and perspective-shift ($p = .001$) tasks rated their writing tasks as significantly more meaningful overall than those in the control condition. There was no main effect for day and no interaction effect.

The ANOVA for ratings of how emotional the tasks were (Figure 2b) also revealed a significant main effect for condition ($F_{(2,22)} = 14.569$, $p < .001$), with *post hoc* tests showing that participants in both the Pennebaker ($p < .001$) and the perspective-shift ($p = .001$) conditions rated their tasks as significantly more emotional overall than those in the control condition. There was also a significant interaction effect ($F_{(3.10,34.14)} = 2.949$, $p < .045$), and individual *post hoc* pairwise comparisons revealed that participants in the perspective-shift condition found their writing task significantly less emotional on day 3 than on day 1 ($p = .024$). There was no main effect for day.

The ANOVA for the upsetting ratings (Figure 2c) revealed a significant main effect for condition ($F_{(2,22)} = 13.879$, $p < .001$), with *post hoc* pairwise tests showing that, overall, participants in both the Pennebaker ($p < .001$) and the perspective-shift ($p = .020$) conditions rated their tasks as more upsetting than those in the control condition. In addition, participants in the Pennebaker condition rated their writing tasks as significantly more upsetting overall than those in the perspective-shift condition ($p = .028$). There was a trend for the interaction effect ($F_{(4,44)} = 2.211$, $p < .083$), with *post hoc* tests suggesting that participants in the perspective-shift condition found their task significantly less upsetting on day 3 than on day 1 ($p = .019$). There was no main effect for day.

For the ratings of how enjoyable the tasks were (Figure 2d), there was a significant interaction effect ($F_{(4,44)} = 3.891$, $p = .009$). Pairwise comparisons showed that on day 1, participants in the perspective-shift condition rated their tasks as significantly more enjoyable than those in the Pennebaker condition ($p = .029$), but that on days 2 and 3, this difference disappeared. There was no main effect for the day and no interaction effect.

There were no significant main or interaction effects for the ratings of difficulty.

Short-term impact on mood

Participants' scores on the day-three HADS questionnaire were analysed using one-way ANOVAs, to explore the suggestion that expressive writing creates increases in distress in the short-term, compared with control tasks. There was a non-significant trend in the day-three HADS depression data ($F_{(2,20)} = 3.02$, $p = .071$). *Post hoc* tests revealed that participants in the Pennebaker condition had higher scores for HADS depression than participants in the control condition ($p = .072$). This trend is consistent with the findings reported above that participants in the Pennebaker condition rated their writing tasks as more emotional and more upsetting than participants in the control condition. On the other hand, participants in the perspective-shift condition did not differ from those in the control condition ($p = .841$). There were no differences between the three groups in terms of day-three HADS anxiety scores ($F_{(2,20)} = 1.82$, $p = .187$).

Pre- and post- outcomes

Baseline demographic information and clinical characteristics by group

Table 1 presents details of participants ($N = 22$) in the three randomised groups in terms of age, gender and BMI, and their mean baseline scores (with standard deviations) on the main variables of interest. Of note, participants' total scores on the EDE-Q were not statistically different from the community-based norms reported by Fairburn and Beglin (1994) which indicate a degree of concern with eating, weight or shape even within the non-clinical population. One-way ANOVAs and Kruskall Wallis tests indicated no significant differences between the three groups on any variable at baseline.

4- and 8-week follow-ups

Mixed-design ANOVAs were used to explore the impact of the three writing tasks on the main outcome measures of eating disorder symptoms, inhibited self-expression, experiential avoidance, cognitive flexibility, empathy and mood. Participants' scores at baseline and at 4- and 8-week follow-up were compared across the three groups. Table 2 sets out the results of these ANOVAs.

The total score from the eating disorders examination questionnaire (EDE-Q) was used as an overall measure of eating disorder symptoms. The ANOVA revealed a main effect for time. Adjusted *post hoc* test indicated a decrease in participants' EDE-Q scores from baseline to 8 weeks ($p = .063$), and this was confirmed

Table 1 Demographic information and clinical characteristics by group at baseline

Variable	Total (N = 22)	Trial Condition		
		Pennebaker (N = 6)	Perspective-shift (N = 9)	Control (N = 7)
Age	32.60 (6.5)	32.00 (5.1)	35.22 (7.0)	29.71 (6.3)
Gender ratio	2:9	2:4	1:8	1:7
BMI	25.12 (5.7)	25.40 (7.9)	26.11 (5.2)	23.63 (4.4)
Anxiety	7.00 (4.0)	7.17 (6.3)	5.33 (2.3)	9.00 (2.3)
Depression	4.68 (2.8)	5.67 (3.0)	4.22 (2.9)	4.43 (2.7)
EDE-Q (Total)	1.09 (1.1)	1.07 (1.5)	0.92 (1.0)	1.31 (1.2)
Inhibited expression	79.82 (15.2)	84.67 (22.7)	77.78 (10.3)	78.29 (14.2)
Cognitive flexibility	53.90 (7.7)	50.17 (7.3)	57.22 (8.6)	52.67 (5.2)
Experiential avoidance	52.45 (11.4)	49.17 (15.5)	51.44 (11.1)	56.57 (7.6)
Cognitive empathy	24.50 (4.3)	25.83 (2.0)	24.00 (3.5)	24.00 (6.5)
Emotional empathy	26.77 (3.9)	27.50 (3.4)	27.22 (4.2)	25.57 (4.2)

by the non-parametric analysis ($Z = -1.997$, $p = .046$). This effect is depicted in Figure 3. There was no main effect for condition and no interaction effect.

The ANOVA for HADS Anxiety scores revealed a significant main effect for time. Adjusted *post hoc* comparisons suggested that overall, there was a decrease in anxiety from baseline to 8-week follow-up ($p = .076$) and from 4- to 8-week follow-up ($p = .054$). Non-parametric confirmatory analysis suggested that only the decrease from 4- to 8-week follow-up was significant ($Z = -2.132$, $p = .033$). There was no main effect for writing condition, and contrary to prediction, no interaction effects. These results are depicted in Figure 4.

There were no significant effects for any of the other variables.

Table 2 Output for mixed-design ANOVAs

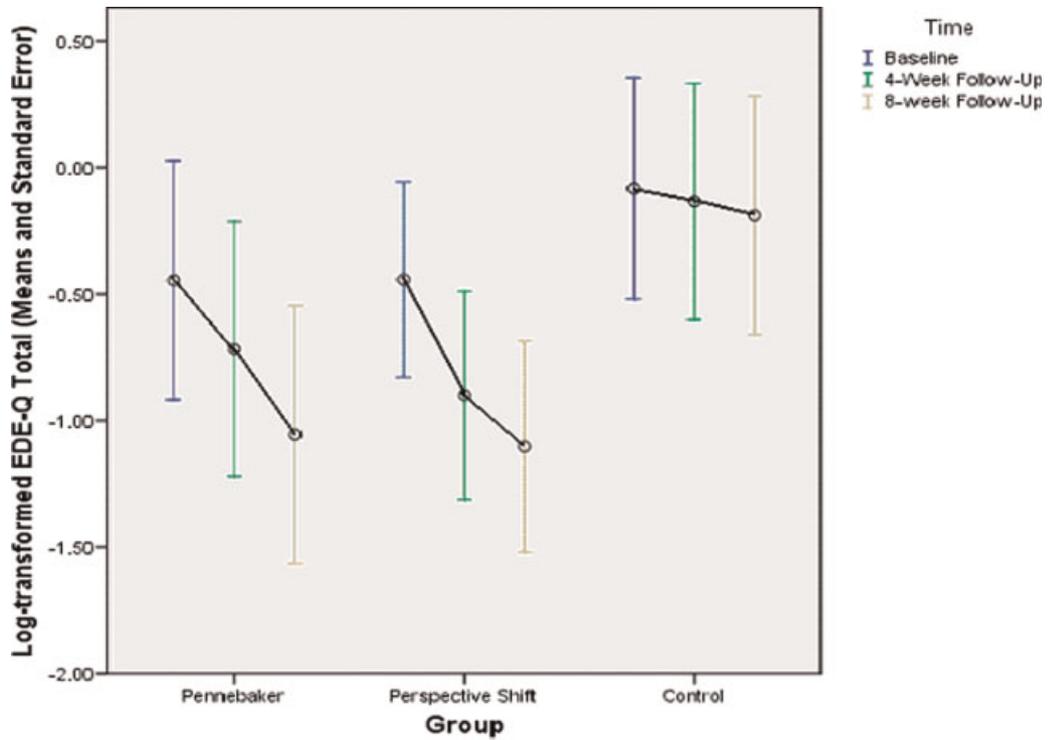| Outcome Variable	Effect	d.f.	F	p
HADS anxiety	Main (condition)	2, 19	2.166	.142
	Main (time)	1.542, 29.307	4.240	.033*
	Interaction	3.085, 29.307	0.798	.508
HADS depression	Main (condition)	2, 19	0.534	.595
	Main (time)	1.546, 29.368	0.306	.683
	Interaction	3.091, 29.368	0.492	.696
Eating disorders questionnaire total	Main (condition)	2, 19	0.761	.481
	Main (time)	1.331, 25.291	5.390	.021*
	Interaction	2.662, 25.291	0.902	.444
Silencing the self-scale total	Main (condition)	2, 19	0.148	.863
	Main (time)	2, 38	1.872	.168
	Interaction	4, 38	0.325	.859
Action and acceptance questionnaire	Main (condition)	2, 19	0.527	.598
	Main (time)	2, 38	0.278	.759
	Interaction	4, 38	1.191	.331
Cognitive flexibility scale	Main (condition)	2, 18	1.799	.194
	Main (time)	1.278, 23.009	0.986	.353
	Interaction	2.557, 22.009	1.287	.292
IRI perspective taking subscale	Main (condition)	2, 19	0.282	.758
	Main (time)	1.529, 29.052	2.400	.120
	Interaction	3.058, 29.052	0.985	.415
IRI empathic concern subscale	Main (condition)	2, 19	0.447	.646
	Main (time)	2, 38	1.424	.253
	Interaction	4, 38	0.366	.832

*Significant at the .05 level.

Figure 3 Plot of log-transformed EDE-Q scores across time by condition
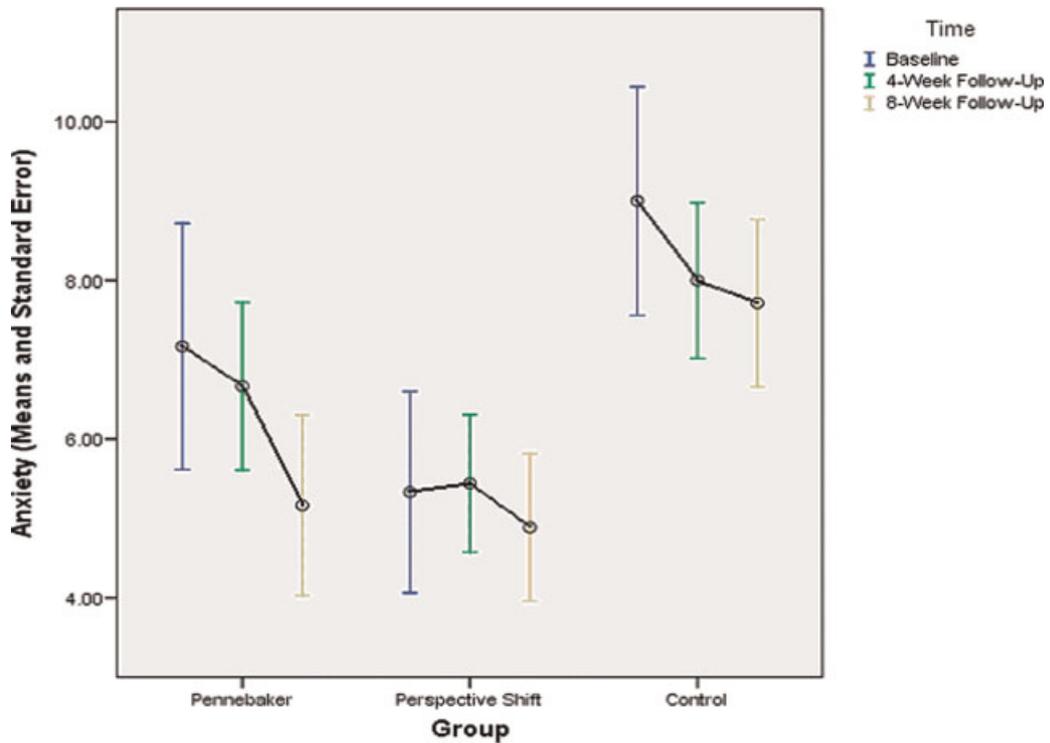

Figure 4 Plot of anxiety scores across time by condition

Table 3 Effect size calculations

Outcome variable	Condition	Mean Scores† (SD)			Effect Sizes (r)‡	
		Baseline	4-week	8-week	Baseline to 4-week	Baseline to 8-week
HADS anxiety	Pennebaker	7.17 (6.3)	6.67 (3.7)	5.17 (3.3)	0.03	0.07
	Perspective-shift	5.33 (2.3)	5.44 (2.5)	4.89 (2.4)	−0.03	0.09
	Control	9.00 (2.3)	8.00 (2.8)	7.71 (2.8)	0.21*	0.24*
HADS depression	Pennebaker	5.67 (3.0)	4.33 (2.6)	4.83 (2.7)	0.23*	0.14*
	Perspective-shift	4.22 (2.9)	3.77 (2.1)	3.77 (2.3)	0.08	0.04
	Control	4.43 (2.7)	4.86 (3.0)	5.29 (2.8)	−0.07	−0.15*
EDE-Q Total	Pennebaker	−0.45 (1.2)	−0.72 (1.3)	−1.05 (1.5)	0.10*	0.21*
	Perspective-shift	−0.44 (1.1)	−0.90 (1.2)	−1.10 (1.1)	0.20*	0.29*
	Control	−0.08 (1.6)	−0.13 (1.3)	−0.19 (1.3)	0.02	0.05
STSS Total	Pennebaker	4.41 (0.3)	4.40 (0.3)	4.34 (0.3)	0.02	0.11*
	Perspective-shift	4.35 (0.1)	4.34 (0.2)	4.29 (0.2)	0.03	0.12*
	Control	4.35 (0.2)	4.37 (0.2)	4.35 (0.2)	−0.05	0.00
AAQ-II	Pennebaker	6.92 (1.2)	6.93 (1.3)	6.87 (1.4)	0.01	0.01
	Perspective-shift	7.13 (0.8)	7.19 (0.7)	7.44 (0.6)	0.01	−0.21*
	Control	7.51 (0.5)	7.29 (0.7)	7.32 (0.6)	0.15*	0.15*
Cognitive flexibility scale	Pennebaker	50.17 (7.3)	56.33 (5.9)	55.67 (7.2)	−0.42**	−0.36**
	Perspective-shift	57.22 (8.6)	56.67 (9.7)	59.11 (7.2)	0.06	−0.11*
	Control	52.67 (5.1)	49.83 (6.9)	52.00 (7.0)	0.22*	0.05
IRI perspective taking	Pennebaker	2.65 (0.4)	2.88 (0.5)	2.76 (0.5)	0.26*	0.11*
	Perspective-shift	2.91 (0.7)	2.99 (1.3)	2.58 (1.2)	0.02	−0.11*
	Control	2.84 (1.0)	3.32 (0.7)	3.09 (0.9)	0.21*	0.06
IRI empathic concern	Pennebaker	27.50 (3.4)	28.00 (2.9)	27.83 (3.8)	−0.07	−0.05
	Perspective-shift	27.22 (4.2)	27.89 (3.8)	28.33 (3.4)	−0.08	−0.14*
	Control	25.57 (4.1)	27.29 (3.8)	26.29 (3.6)	−0.21*	−0.09

† NB: Data for some variables were transformed to meet the assumption of normality. ‡ Note that negative effect sizes indicate an increase in scores; positive effect sizes indicate a decrease in scores. * A small effect size (Cohen, 1992). ** A medium effect size.

Effect sizes

Previous studies of expressive writing with healthy participants have suggested pre- to post- effect sizes of around $r = 0.31$ ($d = 0.66$) for psychological well-being outcomes (Smyth, 1998). According to the power calculation for the present study, the total N of 22 in the trial would be sufficient to detect main effects of this size; however, this number of participants would be insufficient to detect significant differences between the three groups, meaning a liability of Type II error when using ANOVA calculations. As an alternative way to explore the differential impact of a number of interventions when the sample size is small, within-group effect sizes can be calculated. Using Rosenthal's procedure (Rosenthal, 1991), the effect sizes of changes from baseline to 4- and to 8-week follow-up were therefore determined for each of the three writing conditions.[1] The results of these calculations are presented in Table 3.

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[1] These time-point comparisons were deemed to be the most relevant in terms of the therapeutic impact of an intervention.

Consistent with the results of the ANOVA, participants in the Pennebaker condition displayed decreases in their scores on the EDE-Q, at both the 4- and the 8-week follow-ups. The Pennebaker participants also showed increases in cognitive flexibility and decreases in depression at both time points, and a reduction in inhibited self-expression at 8 weeks. The effect sizes for these changes ranged from very small ($r = 0.1$) to medium ($r = 0.3$–0.5) (Cohen, 1992). Interestingly participants in the Pennebaker condition also demonstrated a decrease in cognitive empathy at 8 weeks, though the effect size was very small. There were no other sizeable changes for this group.

Participants in the perspective-shift condition showed decreases in their scores on the EDE-Q at both time points, and these represented small effect sizes. At 8 weeks, participants in this group also demonstrated reductions in inhibited self-expression and experiential avoidance, increases in cognitive flexibility, and increases in emotional and cognitive empathy. The effect sizes for these changes ranged from

very small to small. There were no other sizeable changes for the perspective-shift group.

For the control group, there were decreases in anxiety at both 4- and 8-week follow-ups, and an increase in emotional empathy at 4-week follow-up (only). At 4 weeks there was a decrease in cognitive flexibility and in cognitive empathy. At 8 weeks, participants in the control group showed an increase in their depression scores. There was an increase in experiential avoidance at both 4 and 8 weeks. These changes were all calculated as small effect sizes. There were no sizeable changes for any other variables, including EDE-Q scores.

Conclusion

AN remains a poorly understood psychiatric disorder. The level of empirical evidence in the field is far behind that of other psychiatric conditions, and there continues to be no clear indication as to the best treatment approaches for this complex disorder. This study was designed as a preliminary evaluation of the writing-based tasks recently incorporated into clinical interventions for eating disorders (Maudsley Eating Disorders Team, unpublished manual). This pilot trial was conducted in a non-clinical sample, and explored the subjective appeal and objective impact of three writing approaches, including a previously-unevaluated perspective-shift task.

Participants' subjective ratings of the writing experience indicated that the two experimental tasks were relatively 'potent' and emotionally-stimulating while the control task was found to be generally 'innocuous'. For example, participants rated the experimental writing tasks as significantly more 'meaningful', 'emotional' and 'upsetting' than the control task, which on average was rated as 4/10 or less on these variables. This confirms that emotional disclosure writing engages participants in a way quite different to a neutral and factual writing exercise.

There were also some interesting differences between the two experimental conditions. In particular, the Pennebaker task was associated with poorer short-term mood than the perspective-shift task (or control task). Participants also found the perspective-shift task significantly less upsetting overall than the Pennebaker task, and significantly less emotional as the sessions progressed. Participants in this condition also did not differ significantly from controls in terms of their depression scores on day 3.

This pattern of results suggests that a task which asks participants to delve deeper each day into their innermost thoughts and feelings is more effective in engaging individuals at an emotional level. However, when individuals shift away from a first-person perspective and towards a 'big picture' view-point, they appear to become less emotionally engaged with the subject matter. From a clinical perspective, such 'decentring' may be a useful and necessary therapeutic process; indeed, encouraging individuals to take a more objective view of their situation is a standard approach in cognitive behavioural theory (e.g. Beck, 1995). On the other hand, some researchers have suggested that individuals with AN are already extremely good at exerting cognitive control over their environment (Connan, Campbell, Katzman, Lightman, & Treasure, 2003) and that instead re-engagement with emotional experiences may be the 'missing link' in recovery from AN (LoBue, 2002). This may be why cognitive-behavioural approaches—so successful in other disorders—have shown such little success in AN (Channon, de Silva, Hemsley, & Perkins, 1989; McIntosh et al., 2005).

Those students who completed the baseline questionnaires but did not complete the writing tasks or follow-ups were more experientially avoidant than those who elected to take part. This is consistent with previous studies suggesting that emotionally-avoidant individuals are less likely to benefit from Pennebaker-style writing tasks (Frayne & Wade, 2006; Stanton et al., 2002). The present findings furthermore suggest that individuals with avoidant traits may be reluctant to even engage in such writing tasks. This is particularly pertinent when taken in conjunction with the indication that these writing exercises can at times be highly emotional and upsetting, even for healthy participants who were directed away from overly-distressing or traumatic topics. This has clear implications in terms the 'palatability' of therapeutic exercises, and the potential 'side-effects' of this type of intervention. The findings from the present study underscore the point made by Schmidt et al. (2002) that therapeutic writing is best used in the context of a strong therapeutic rapport, good engagement, and a collaborative framework, and that clients should be adequately prepared for the process of writing.

Both ANOVAs and effect size calculations were used to determine the objective impact of the three writing tasks. The overall pattern of results indicated that the experimental tasks had a beneficial impact on a number

of the main outcome variables, but that the control task typically had either less effect, no effect or a detrimental effect on these outcomes.

In particular, there was a significant finding for scores on the eating disorder examination questionnaire (EDE-Q), with the results of the ANOVA indicating that all three writing tasks reduced global scores on this measure. However, additional effects size calculations suggested that the changes in the control condition were negligible and that the effect was notable only for the experimental groups. This is an intriguing finding, given that in two previous ED-related studies, the control task was found to be equally or more effective than the experimental task (Earnhardt et al., 2002; Stanton et al., 2002). The present results may be accounted for by the findings that non-trauma control writing is more helpful for individuals who have an avoidant style (Frayne & Wade, 2006; Stanton et al., 2002). In the present study, participants higher in experiential avoidance did not take part, and it is possible that the control task therefore had less impact on the remaining participants.

The results also indicated that the two experimental tasks were modestly effective in ameliorating certain cognitive, affective and interpersonal features associated with eating difficulties as potential maintaining factors (Schmidt & Treasure, 2006). There were positive outcomes for one or both of these tasks regarding inhibited self-expression, cognitive empathy, emotional empathy, mood, cognitive flexibility and experiential avoidance. There were also a number of additional results which were not expected, but which were consistent with the overall pattern of results and hypotheses. For example, an *increase* in longer-term depression scores was observed for the control task, as well as increases in experiential avoidance, and a reduction in cognitive flexibility. Additionally, both the control task and the Pennebaker task resulted in a *reduction* in cognitive empathy, suggesting that these writing tasks tend to decrease individuals' awareness of interpersonal perspectives. This interestingly suggests that objective or self-focussed writing tasks may not be the most appropriate when the aim is to broaden an individual's point of view.

Limitations

The relative lack of eating disorder pathology in the present sample means that notable caution needs to be

exercised in relating the results of this study to a clinical population, and specifically to the AN population. Given the relatively asymptomatic nature of the group, these results cannot be taken as direct evidence for the application of writing tasks to the treatment of AN. However, the results do suggest that this is a line of research worth pursuing.

The study was significantly hampered by low-uptake and high-attrition rates. The study sample represents less than half that those originally invited to participate and the small sample size meant that a number of the results of interest were based solely on effect size calculations. Furthermore, the majority of the analyses were performed only on participants who completed the trial in full, and the results were therefore unavoidably biased, not least by the fact that completers and non-completers differed in terms of their baseline scores on experiential avoidance. It must also be noted that the majority of outcome measures, other than the HADS mood rating, were not administered until a month after the writing tasks were completed. Although this is in keeping with previous studies, it is possible that the observed changes may have been due to factors other than the writing tasks, and also that immediate post-treatment outcomes might have been quite different to those observed after 4 or 8 weeks.

Indeed, certain of the findings from this study were directly contrary to expectation. For example, participants in the control task showed an increase in emotional empathy—a result which is difficult to interpret. The control task (which asked participants to focus on neutral topics rather than on the thoughts and feelings relating to a stressful event) was also the most effective in reducing anxiety. This finding might be explained in terms of the application of distraction techniques to the management of anxiety symptoms (e.g. Kennerley, 1997). However, it is also possible that these unexpected results are spurious, and attributable to factors such as small sample size and gender heterogeneity. This inevitably means that caution must similarly be exercised regarding the reliability of those results which were consistent with predictions.

Summary and future directions

The findings of this study indicate that at least among healthy participants, expressive writing tasks may be able to address a number of the traits associated with

AN, such as cognitive rigidity or inhibited self-expression, as well as reducing concerns with eating, weight and shape. The study also provides some initial indications of the differential impact of different forms of therapeutic writing on these outcomes, and their differential subjective impact and appeal. Although this study does not itself provide direct support for the application of writing tasks to the treatment of eating disorders, it does contribute to the small but growing literature on the use of expressive writing in the eating disorder context, and thus provides indirect support for the incorporation of such tasks in interventions for AN. Given the limitations outlined above, further studies will first be necessary to replicate and strengthen the present results with a larger sample and with additional post-treatment measures. The present paradigm might also usefully be employed to evaluate a number of the other writing tasks currently incorporated into interventions for AN. Finally, the results of this small-scale exploratory trial with a student sample ultimately require replication and extension into the symptomatic population and clinical setting.

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