Effects of Expressive Writing on Physical and Psychological Symptoms in Women Undergoing Surgery for Gynaecological Cancer

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Overview

Part 1 reviews the expressive writing literature and evaluates the evidence for its health benefits in medical populations.

Part 2 is an empirical study which investigates the feasibility and outcomes of expressive writing as a psychological intervention following major gynaecological surgery. This was part of a joint project (Delmar-Morgan, 2008; Thomas, 2008). An outline of each trainee's contribution to the project is in Appendix 1.

Part 3 is a critical reflection on the process of conducting the empirical study.

Table of Contents

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Part 1: Literature Review

Health Benefits of Expressive Writing in Medical Populations

Abstract

Expressive writing (Pennebaker & Beall, 1986) has been found to produce physical and psychological health benefits (Smyth, 1998). Research has traditionally focussed on non-clinical populations, although there is a body of research investigating its impact on people with medical conditions. This review aims to evaluate the evidence for the health benefits of expressive writing in medical populations. The 21 studies reviewed provide some empirical support for its benefits, particularly on physical health outcomes such as pain, sleep, health care utilisation and objective measures of disease activity. Methodological issues, directions for future research and clinical implications are discussed.

Introduction

Emotional expression has long been considered an important concept in psychology. Many theorists, dating back to Breuer and Freud (1895/1966), have argued that the expression of emotions is important for good physical and mental health. A large body of more recent research has suggested that emotional expression has beneficial effects on health (e.g. Fawzy et al., 1993; Pennebaker & O'Heeron, 1984; Spiegel, Bloom, Kraemer & Gottheil, 1989) whereas emotional inhibition can have deleterious effects (e.g. Jensen, 1987; Larson, 1990).

There has been a growing interest in writing as a mode of emotional expression and studies have been carried out to investigate its impact on health. This research has been greatly influenced by the work of Pennebaker and Beall (1986) who developed an expressive writing paradigm. This involves people writing about their "deepest thoughts and feelings" usually concerning a traumatic experience in their life. The writing sessions are generally conducted over three to five consecutive days and each session lasts approximately 20 minutes. At baseline and various follow-up points, participants are measured on a variety of health outcomes to assess the effects of the writing. These results are compared with a control condition which typically involves writing about neutral topics, such as how participants use their time.

Pennebaker's writing paradigm has been used in numerous studies over the last 20 years, mostly focussing on non-clinical populations such as healthy college students. Beneficial effects on both physical and emotional health have been found. These include improvements in objectively assessed outcomes (e.g. illness-related visits to the doctor and immune system functioning), self-reported physical health outcomes (e.g.

physical symptoms and number of days affected by illness) and self-reported emotional health outcomes (e.g. mood and psychological well-being) (Baikie & Wilhelm, 2005).

Expressive writing research has recently broadened its attention to investigate whether benefits also exist for clinical populations. Study participants have included people with medical conditions such as cancer, asthma and rheumatoid arthritis, and people with psychological conditions, such as post-traumatic stress disorder (Frattaroli, 2006).

The aim of this review is to evaluate the health benefits that expressive writing may hold for people with medical conditions. Expressive writing studies in physically ill populations have burgeoned during recent years and this body of research now incorporates a wide variety of medical conditions, as well as physical and psychological health outcomes. There is also significant methodological variation across studies. A review is therefore merited to examine the health benefits of expressive writing on patients with medical conditions and to critically evaluate the methodology used.

This review will firstly give a brief overview of the theories that have been proposed to explain expressive writing's benefits and then summarise previous reviews of expressive writing studies. The Method section will describe the criteria and search strategy used to select studies included in this review. In the Results section, expressive writing studies will be presented by disease type and discussed with respect to their health outcomes and methodology. Finally, the Discussion will summarise the findings and discuss issues pertinent to this collection of studies.

It is worth noting that various terms, including 'expressive writing', 'experimental disclosure' and 'emotional disclosure', are all used within this body of

research to refer to the intervention that follows Pennebaker and Beall's (1986) paradigm. 'Expressive writing' will be the term generally used in this review.

Theoretical explanations of expressive writing

A number of theoretical explanations of the mechanisms of expressive writing have been suggested, but relatively little research has focussed on this. Three main theories have been proposed to explain its beneficial effects: emotional inhibition, cognitive adaptation and exposure/emotional processing, and there is supportive as well as contradictory evidence for each of them (Sloan & Marx, 2004).

'Emotional inhibition' was the original explanatory theory for the health benefits of expressive writing. It is based on the assumption that unexpressed emotion can lead to chronic autonomic arousal, weakening of the immune system and illness (King, 2002). For example, a link between emotional inhibition and cancer onset and progression has been suggested (Fawzy et al., 1993), although other evidence does not support this (Petticrew, Bell & Hunter, 2002). Pennebaker (1989, cited in Sloan & Marx, 2004) proposed that disclosing once-inhibited feelings during expressive writing leads to a reduction in stress and improved immune functioning and health.

The empirical support for this theory is equivocal. In support of it are findings that participants who avoided emotional content during writing showed no positive effects (Pennebaker & Beall, 1986) and that expressive writing leads to improvement in immune functioning (e.g. Esterling, Antoni, Fletcher, Marguiles & Schneiderman, 1994). However, other studies provide evidence against the theory. For instance, Greenberg and Stone (1992) showed that writing about traumatic events previously discussed with others is as likely to produce health benefits as writing about events not previously discussed, which is contrary to the theory's predictions. It has also been

found that participants who write only about their emotions about a traumatic experience did not benefit as much as those who wrote about the event itself and expressed their feelings about it (Pennebaker & Beall, 1986). Emotional expression per se, therefore, does not appear to explain expressive writing's benefits and research findings suggest other factors are also involved.

'Cognitive adaptation' theory highlights the cognitive processes involved in adapting to traumatic or stressful life events. Pennebaker and others have suggested that expressive writing "may allow an individual to provide structure, organisation and cohesion to the traumatic memory" which may promote insight and lead to decreased stress and improved physical health (Sloan & Marx, 2004, p. 123).

This theory has been investigated by analysing the linguistic content of writing samples and this research has produced contradictory findings. Some studies (e.g. Pennebaker & Francis, 1996) found that the use of words implying insight and causation, which are purported to indicate cognitive processing, was positively associated with physical health at follow-up, whereas other studies (e.g. Creswell et al., 2007) found that these words were not associated with physical health at follow-up. Computer programs, such as the Linguistic Inquiry Word Count (LIWC), are typically used in the content analyses in these studies. However, the limitations of such programs to detect the subtlety of cognitive processes may explain the lack of consistent support for this theory.

The 'exposure/emotional processing' theory has roots in learning theory and equates expressive writing to an intervention in which an individual is exposed to aversive stimuli, such as a traumatic experience. This exposure can lead to the proper processing of emotional material and may reduce distress "by overcoming a person's

tendency to avoid or suppress distressing memories, emotions, thoughts or physiological sensations" (Sloan & Marx, 2004, p. 125).

One method commonly used to test this theory is to examine changes in post-traumatic symptoms (e.g. intrusive thoughts and avoidance) since these would be expected to reduce after expressive writing if exposure is the mechanism of change. However, findings have been mixed, with some studies reporting no change in intrusions and avoidance-related symptoms (e.g. De Moor et al., 2002). It has been suggested that the mixed findings may be due to the fact that the expressive writing paradigm differs from standard exposure techniques in important ways. For instance, writing instructions do not generally specify that the participant writes about the same topic each day and yet repeated exposure to the same experience is believed to be critical to successful extinction. Sloan, Marx and Epstein (2005) addressed this issue by changing the experimental methodology to more typically reflect exposure-based therapy procedures. Participants instructed to write about the same traumatic event during each session showed significant improvements in psychological and physical functioning, whereas those writing about different traumatic experiences or non-traumatic experiences did not. The study therefore provides some support for the 'exposure' theory.

Two other, less well-researched, theories have also been proposed. Pennebaker and Graybeal (2001) have suggested that expressive writing's benefits are related to the changes it induces in participants' social interactions in the real world. A second theory is that self-affirmation, defined as "a positive reflection on a valued self-domain", underlies the benefits of expressive writing (Creswell et al., 2007, p. 240). Evidence supporting this was found in content analyses which showed that self-affirmation writing mediated the effects of expressive writing on physical symptoms at follow-up.

Further research is clearly needed to understand the mechanisms underlying expressive writing. It is likely that one single mechanism will not be able to fully explain its beneficial effects and therefore studies that examine several mechanisms concurrently will be most informative.

Previous reviews

Four published meta-analyses have been conducted on expressive writing studies since 1998. One focussed on expressive writing in healthy populations (Smyth, 1998), one focussed on clinical populations (Frisina, Borod & Lepore, 2004) and two on both healthy and clinical populations (Harris, 2006; Frattaroli, 2006). A qualitative review was also conducted on clinical populations (Baikie & Wilhelm, 2005). Table 1 summarises the main characteristics of these reviews. Effect sizes are noted in Table 1 or in the description of the review.

Smyth (1998) conducted a meta-analysis of 13 studies which examined the effects of expressive writing in healthy populations. Overall, expressive writing was associated with positive outcomes of medium effect size; the mean weighted effect size across all studies and outcomes was d=0.47 representing a 23% improvement in overall health. Different health outcomes were analysed and improvements of medium effect size were found in reported health, psychological well-being, physiological functioning and general functioning, although no change was found in health behaviours. These improvements were found when outcomes were measured at least one month post-writing. The meta-analysis also found that short-term distress was increased by the writing task, although this was unrelated to changes in health outcomes. There was considerable variability in effect sizes across studies and significant within-group variance, so the review also examined moderating factors. Two main factors moderated

Table 1. Reviews of Expressive Writing Studies

Review	Sample	Method	Number of Studies	Summary
Smyth (1998)	Healthy Populations	Meta-analysis	13	• Written emotional expression produces significant health benefits in healthy populations (effect size d=0.47, p<.0001). • Health enhanced in four outcome types (reported physical health, physiological functioning, psychological well-being, general functioning) • Moderators identified.
Frisina et al. (2004)	Clinical populations (Physical disorder [5]or psychiatric disorder [4])	Meta-analysis	9	Expressive writing: • Improves overall health (d=0.19, p<.05). • Improves physical (d=.021, p=.01) but not psychological health outcomes (d=0.07, p=.17) • Less effective for psychiatric than physically ill populations
Baikie & Wilhelm (2005)	Clinical populations (Medical condition or psychological condition)	Qualitative Review	-	• Reviewed expressive writing studies, discussed possible mechanisms and made suggestions regarding use as therapeutic tool.
Harris (2006)	Healthy populations [13] Medical populations [6] Psychological sample [10]	Meta-analysis	29	• Expressive writing reduces health care utilisation in healthy samples (g=0.16) but not in either of the other two groups.
Frattaroli (2006)	Healthy and Clinical Populations	Meta-analysis	146	• Experimental disclosure is effective with a positive and significant r-effect size of 0.075 • Moderators identified.

the overall effect size: the proportion of male participants and the amount of time over which the writing intervention was spaced, i.e. effect sizes were greater in studies with more men and with writing over longer time periods.

Frisina et al.'s (2004) meta-analysis reviewed nine expressive writing studies with people with physical disorders, such as cancer, or psychiatric disorders, such as posttraumatic stress disorder. On average, expressive writing had a positive and significant effect on health in these clinical populations, although it was less effective for psychiatric than physically ill populations, and the overall mean effect sizes were small. Significant improvements were found in physical health outcomes overall, but not in psychological health outcomes. However, improvements were found in several individual psychological health outcomes including depression (as measured by the Beck Depression Scale) and sleep quality (as measured by the Pittsburgh Sleep Quality Index).

Baikie and Wilhelm (2005) conducted a qualitative review of expressive writing in clinical populations. It was a descriptive, rather than systematic, review of the literature and the number of studies reviewed was not specified. They concluded that expressive writing produced significant benefits for people with a wide variety of medical problems including cancer, asthma, rheumatoid arthritis, HIV infection, cystic fibrosis and chronic pelvic pain. Consistent with Frisina et al. (2004) they noted the mixed results found in studies of people with psychological conditions and trauma survivors.

Harris's (2006) meta-analysis reviewed 29 studies across three different groups of participants: healthy samples, participants with pre-existing medical conditions and those pre-screened for stress, trauma or other psychological factors. It focussed on the

impact of expressive writing on one outcome measure, health care utilisation, which is an outcome frequently used in this domain of research. Expressive writing reduced health care utilisation in healthy samples, although the effect size was small. It did not significantly reduce health care utilisation in either of the other two groups.

In the most extensive meta-analysis to date, Frattaroli (2006) reviewed 146 randomised studies which investigated expressive writing in healthy and clinical populations. Expressive writing was found to be effective, but the unweighted average effect size was very small. This was considerably smaller than the average effect sizes in the Smyth (1998) and Frisina et al. (2004) meta-analyses. However, Frattaroli points out that it is larger than the effect sizes of widely implemented medical treatments, such as taking a daily aspirin following heart attacks. Effect sizes were also calculated across studies for six different outcome types (psychological health, physiological functioning, reported health, subjective impact of the intervention, general functioning and health behaviours). The effect sizes were small, but the results were consistent with Smyth's (1998) findings as significant improvements were found in all outcome types except health behaviours. Each outcome type was broken down into sub-categories and the impacts of the intervention on these identified. For instance, psychological health was divided into 13 sub-categories and expressive writing was found to have an effect on distress, depression and positive functioning.

There was much heterogeneity amongst the studies Frattaroli reviewed, in terms of setting, participant, methodological and treatment variables. It is therefore important to interpret the average effect sizes with caution. The review identified that many study variables correlated with the size of the effect for particular outcome types; it was suggested that these were potential moderators, although the relationships could be

explained by unidentified third variables. Two setting variables found to correlate with effect sizes were the location of the writing sessions and degree of privacy associated with them. Studies in which participants disclosed at home, as opposed to in a controlled setting, and studies which provided greater privacy during disclosure had larger psychological health effect sizes. In terms of participant variables, and consistent with Smyth (1998), studies with more male participants had larger effect sizes than studies with smaller proportions of men. One methodological variable found to correlate with effect sizes was length of follow-up period. Studies with less than one month follow-up periods had larger 'overall' and 'psychological health' effect sizes than studies with longer follow-up periods. In terms of treatment variables, the findings suggested that the higher the writing 'dose' the larger the effect. However, in contrast to Smyth's (1998) findings, the spacing of the writing sessions was not found to moderate any of the outcomes.

Overall, these meta-analyses provide evidence for the health benefits of expressive writing in both clinical and healthy populations. However, they also highlight that there is considerable variation in outcomes; not all individuals benefit equally from this intervention and a number of variables appear to moderate its effects. None of the previous meta-analyses have taken an in-depth look at expressive writing's effects on participants with medical conditions. The current review aims to do this.

Method

Search strategy

The review was limited to papers published in English peer-reviewed journals up until December 2007. Studies were identified through a number of research databases including PsychINFO, Medline and Google Scholar. Combinations of the following

search terms were used: "expressive writing", "emotional disclosure", "disclosure" "emotional expression", "emotional writing", "health", "psychological health", "psychological adjustment", "medical", "clinical", "disease", "Pennebaker", "writing", "written communication". Reference lists of articles and review papers were searched to find additional articles not identified through online databases. A reference list of expressive writing studies on James Pennebaker's website (www.psy.utexas.edu/Pennebaker/) was also used for this purpose.

Inclusion criteria

Studies were included if they met the following four criteria. First, they used the Pennebaker and Beall (1986) expressive writing paradigm or some close variant of this. Several studies used verbal disclosure when participants had writing difficulties (e.g. Kelley, Lumley & Leisen, 1997) and these were included. Second, participants were adults who had a diagnosable medical condition. Third, studies investigated expressive writing as an intervention and included quantitative outcome measures of health. Fourth, studies included an experimental (expressive writing) condition and a comparison group. The latter was generally a neutral writing or non-writing condition, although some studies included a second comparison group in addition to this. (e.g. a 'benefit finding' condition which encouraged participants to write about their positive thoughts and feelings).

Examples of excluded studies

Mann (2001) is an example of a study that was excluded due to lack of conformity to the expressive writing paradigm. The writing intervention involved HIV patients being asked to write about a 'positive future', rather than about a stressful or traumatic personal experience. Several studies were excluded because the participants

did not have a diagnosable medical condition; these included participants who were poor sleepers (Harvey & Farrell, 2003) and primary care patients with no medical diagnosis (Klapow et al., 2001). After discussion with a senior member of the research team, it was decided that a study on people with elevated blood pressure would be included in the review (McGuire, Greenberg & Gevirtz, 2005). One study was excluded as its participants were adolescents (Warner et al., 2006) and another was excluded as it examined the effects of expressive writing in women with breast cancer who were concurrently participating in a support group (Smith, Anderson-Hanley, Langrock & Compas, 2005).

Results

Twenty-one studies met the criteria and were included in this review. The review includes four additional papers that have been published since Frattaroli's (2006) meta-analysis (Danoff-Burg, Agee, Romanoff, Kremer & Strosberg, 2006; Hamilton-West & Quine, 2007; Gillis, Lumley, Mosley-Williams, Leisen & Roehrs, 2006; Vedhara et al., 2007). Overall, the methodological quality of these studies was high: all had a comparison group and appropriate outcome measures, and the majority employed randomised designs. Following the table is a key to all abbreviations used.

The studies are reviewed in groups according to medical condition: cancer, rheumatoid arthritis, asthma, fibromyalgia, HIV, patients undergoing surgery, chronic pelvic pain, psoriasis and elevated blood pressure. Health outcomes and methodological issues are discussed for each group of studies. Table 2 lists the studies in alphabetical order by author. It summarises the key features of each study and includes effect sizes where they were reported.

Table 2. Expressive Writing Studies

Study	Participants	Research Design	Procedure	Measures & Follow-up	Main Findings
Broderick et al. (2004)	270 patients with rheumatoid arthritis 81% women	Randomly assigned to: ▪ Expressive writing ▪ Enhanced Meaning ▪ Control – neutral writing ▪ Control – non-writing	3 x 20min writing sessions within a week, instructions via video-tape. ▪ EW – any traumatic event ▪ EM - similar to EW with more focus on meaning of traumatic event ▪ Time management writing task ▪ Educational videotape about RA Setting: home	Physical and Psychological Health: ▪ Disease Activity Rating Scale ▪ SF36* ▪ Videotape questions to assess use of video and rating of writing. Follow-up: 4-6months.	No group differences on Disease Activity Rating or the Physical Component Summary (SF36). Between group differences existed at baseline which complicated interpretation of outcomes at follow-up.
Broderick et al. (2005)	92 adults with fibromyalgia 100% women	Randomly assigned to: ▪ Expressive writing ▪ Control - neutral writing ▪ Control - usual care	3 x 20min writing sessions at 1 week intervals. ▪ EW - past or current traumatic event ▪ NW - day-to-day activities Setting: laboratory	Physical and Psychological Health: ▪ QOL* ▪ STAI* ▪ BDI* ▪ MPI* ▪ MPQ* ▪ MOS* ▪ FIQ* ▪ CLINHAQ* Follow-up: post-intervention, 4 & 10 months.	EW group experienced reductions in pain (ES=0.49) and fatigue (ES=0.62) and better psychological well-being (ES=0.47) at 4 month follow-up relative to controls, but these benefits were not maintained at 10 month follow-up.
Danoff-Burg et al. (2006)	75 adults with lupus (21) or rheumatoid arthritis (54) 83% women	Randomly assigned to: ▪ Benefit finding ▪ Expressive writing ▪ Control – neutral writing	4 x 20min writing sessions within 3 week period. ▪ BF – positive thoughts/feelings about illness ▪ EW – deepest thoughts & feelings about illness ▪ NW – facts about illness Setting: private room in laboratory	Physical and Psychological Health: ▪ MHAQ* ▪ CES-D* ▪ POMS* ▪ Pain and fatigue (visual analogue scales)* ▪ STAI* ▪ Manipulation check Follow-ups: 1 & 3 months.	At 3 month follow-up, main effect for group on fatigue. At 1 month (but not 3 month) follow-up main effect for group on pain. BF effective in reducing pain levels for participants with high trait anxiety, whereas EW effective for participants with low trait anxiety. No group effects for psychological functioning and disability.

De Moor et al. (2002)	42 patients with newly diagnosed stage IV renal cell carcinoma 86% men	Randomly assigned to: ▪ Expressive writing ▪ Control - neutral writing	4 writing sessions (duration and spacing not reported). ▪ EW – thoughts and feelings about cancer ▪ NW - different health behaviours Setting: clinic	Physical and psychological health: ▪ IES* ▪ PSS* ▪ POMS* ▪ PSQI* ▪ Manipulation Check Follow-up: final day of writing; 4, 6, 8 & 10 weeks.	No group differences found in distress, perceived stress, or mood disturbance, except for the vigour subscale of the POMS (ES=0.82, p=0.03). EW participants reported higher levels of vigour following writing task than NW participants. Group differences found in 4 sleep-disturbance measures: total sleep disturbance (ES=-0.73, p=0.04), sleep quality (ES=-0.99, p=0.01), sleep duration (ES=-0.87, p=0.04), and daytime dysfunction (ES=-1.03, p=0.04).
Gillis et al. (2006)	83 adults with fibromyalgia 97% women	Randomly assigned to: ▪ Expressive writing ▪ Control - neutral writing	4 x 15/20min writing sessions on consecutive days during a week. ▪ EW - standard instructions including how the stressful experience affects fibromyalgia ▪ NW – time management Setting: home	Physical and Psychological Health: ▪ FIQ* ▪ AIMS2* ▪ Fatigue Severity Scale* ▪ Sleep Quality Scale* ▪ Health care utilisation* ▪ PANAS* ▪ Manipulation Check Follow-up: 1 & 3 months	At 1 month follow-up, NW participants showed more improvements than EW participants on negative affect and social support. At 3 month follow-up, these group differences had disappeared and EW participants showed improvement in global impact of fibromyalgia.
Hamilton-West & Quine (2007)	68 adults with ankylosing apondylitis 66% men	Randomly assigned to: ▪ Expressive writing ▪ Control - neutral writing	3 x 20min writing sessions on consecutive days. ▪ EW – stressful experiences over last month or current concerns. (Whether topic related to AS is optional). ▪ Control – time management exercise Setting: not reported	▪ Physical and Psychological Health: ▪ BASDAI* ▪ BASFI* ▪ BAS-G* ▪ HADS* ▪ EW diaries analysed (LIWC) Follow-up: 1 month & 3 months.	EW participants demonstrated improved functional status at 3 month follow-up compared to controls (ES=0.36). Other outcome measures remained unchanged. Significant associations between linguistic content and improvements in depression and disease activity also revealed.
Harris et al. (2005)	114 adults with asthma	Randomly assigned to: ▪ Expressive writing ▪ Positive	3 x 20min writing sessions, once a week. ▪ EW - stressful or traumatic experiences ▪ PW - positive	Physical health: ▪ Pulmonary function Follow-up: post-intervention, 2 months.	No changes in pulmonary function between groups.

		writing ▪ Control – neutral writing	experiences ▪ NW - events of previous day Setting: laboratory and home		
Kelley et al. (1997)	72 rheumatoid arthritis patients 83% women	Randomly assigned to: ▪ Emotional disclosure ▪ Control	15min session speaking into tape recorder on 4 consecutive days. ▪ ED – deepest feelings about stressful event of choice. ▪ Control – describe neutral pictures. Setting: home	Physical health and Psychological health: ▪ POMS* ▪ AIMS2* ▪ Joint condition ▪ Manipulation Check Follow-up: 2 weeks, 3 months.	ED participants reported less affective disturbance and better physical functioning compared to controls. No main effect of disclosure on pain or doctor rated joint condition. Participants who experienced larger increases in negative mood immediately after disclosure task had greater joint improvement.
McGuire et al. (2005)	38 participants with elevated blood pressure 68% men	Randomly assigned to: ▪ Expressive writing ▪ Control - neutral writing	3 x 20min on consecutive days. ▪ EW – personally traumatic/stressful life experience ▪ Control – time management exercise Setting: home	Physical Health: ▪ STAXI* ▪ Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP) ▪ Skin conductance (SC) ▪ Heart rate variability (HRV) ▪ Manipulation Check Follow-up: 1 & 4 months.	Group x time interaction on 1 measure of HRV: very low frequency wave increased over time in controls, suggesting potentially protective effect of EW. No interaction effects for SC. Main effects for time indicating decreases in SBP & DBP, regardless of group, from baseline to both follow-ups. SBP & DBP decreased from baseline to 1 month in EW. Anger suppression moderated effects of writing on 4 month DBP.
Norman et al. (2004)	48 adults with chronic pelvic pain 100% women	Randomly assigned to: ▪ Expressive writing ▪ Control - positive writing	3 x 20min writing sessions on consecutive days. ▪ EW – negative emotional experiences related to CPP ▪ PW – positive emotional experiences unrelated to CPP Setting: home	Physical and Psychological Health: ▪ MPQ* ▪ SIP* ▪ PANAS* ▪ AEQ* ▪ CSQ* ▪ Manipulation Check Follow-up: 2 months.	Main effect of EW on evaluative pain intensity ratings at follow-up. No main effect on other outcome variables. Three individual difference measures moderated group effects. EW led to less disability among women with higher baseline ambivalence over emotional expression or higher catastrophising, and to increased positive affect among women with higher baseline negative affect.

Petrie et al. (2004)	37 adults with HIV infection 95% men	Randomly assigned to: ▪ Expressive writing ▪ Control - neutral writing	4 x 30min writing sessions on 4 consecutive days. ▪ EW - most traumatic and emotional experiences of their lives (HIV related topics or other issues). ▪ C – time management task. Setting: small, private room. Participants wrote using desktop computer.	Physical health: ▪ HIV viral load and CD4+ lymphocyte counts ▪ Manipulation Check Follow-up: 2 weeks, 3 months, 6 months.	Participants in EW group showed increase CD4+ lymphocyte counts over follow-up period but no sustained change in HIV viral load.
Rivkin et al. (2006)	79 HIV-positive adults 72% men	Randomly assigned to: ▪ Expressive writing ▪ Control - neutral writing	4 x 20min weekly writing sessions: ▪ EW –thoughts/ feelings about being HIV+ ▪ Control – time management task. Setting: home and research setting.	Physical and Psychological health: ▪ HIV disclosure, Social Support, Social Constraints ▪ CES-D* ▪ Immune Function (B2-M) ▪ Stress Related Growth ▪ Manipulation Check ▪ Writing analysed (LIWC) Follow-up: 2 & 6 months	No effects of writing condition, but EW participants who included increasing insight/causation and social words in writing had better immune function and reported more positive changes at follow-up.
Rosenberg et al. (2002)	30 prostate cancer patients 100% men	Randomly assigned to: ▪ Expressive writing ▪ Control – non-writing	4 x 20/30min writing sessions (spacing not reported). ▪ EW – experience of prostate cancer and/or other traumatic experiences Setting: home	Physical and Psychological Health: ▪ Health care utilisation* ▪ Immune function ▪ BPI* ▪ MOS, FACT* ▪ SCL, POMS* ▪ Rumination Scale*, Ways of Coping-Cancer Version* ▪ Writing analysed Follow-up: 3 & 6 months	EW condition showed improvement in physical symptoms (pain) and a trend towards lower health care utilisation and reduced medication use. No improvement in psychological variables, quality of life measures or disease markers and disease relevant aspects of immunocompetence.

Smyth et al. (1999)	61 asthma patients 73% women 51 rheumatoid arthritis patients 71% women	Randomly assigned to: ▪ Expressive writing ▪ Control - neutral writing	3 x 20min writing sessions over consecutive days: ▪ EW – most stressful event of their lives (event of their choice). ▪ NW – plans for the day. Setting: private room in laboratory.	Physical health: ▪ Asthma - lung function ▪ RA - disease activity Follow-up: 2, 8 & 16-weeks	Asthma patients in EW condition showed improvement in lung function at 2, 8 and 16-week follow-up. Rheumatoid arthritis patients in EW condition showed improvement in overall disease activity at 16 week follow-up. Overall, 47% EW participants showed clinical significant improvement, whereas only 24% control participants showed clinically significant improvement at 16 weeks.
Solano et al. (2003)	40 urology inpatients undergoing papilloma resection of the bladder 80% men	Assigned to: ▪ Expressive writing ▪ Control – non-writing	3 x 20min writing sessions over consecutive days before surgery. ▪ EW – thoughts, emotions and worries about surgery and experience of being in hospital. Setting: private room in hospital.	Physical and psychological health: Pre-surgery- ▪ Alexithymia Scale* Post-surgery/day before hospital discharge - ▪ SCL* ▪ Postoperative course record included overall evaluation of the postoperative course. No further follow-ups.	EW participants showed a better postoperative course in terms of objective evaluation (30% less time in hospital post-operation) and subjective psychological well-being. Alexithymia showed main effects on postoperative days of stay in hospital, SCL scores and medical evaluation of postoperative course. Interactions showed that the effect of EW was apparent only in participants high in alexithymia, whereas participants low in alexithymia showed favourable course independent of writing.
Solano et al. (2007)	40 urology inpatients undergoing transurethral resection of the prostate 100% men	Assigned to: ▪ Expressive writing ▪ Control – non-writing	3 x 20min writing sessions over consecutive days before surgery. ▪ EW - thoughts, emotions and worries about surgery and experience of being in hospital. Setting: private room in hospital	Physical and psychological health: Pre-surgery - ▪ Goldman Preoperative Risk Index Post-surgery/day before hospital discharge - ▪ SCL* ▪ Postoperative Course Record	Low-risk EW participants left hospital 1 day before low-risk non-writing participants, and showed a better postoperative course in terms of subjectively reported well-being and medical evaluation. High-risk EW participants showed a nonsignificantly worse postoperative course compared to high-risk non-writing participants.

				▪ Writing analysed No further follow-ups.	
Stanton et al. (2002)	60 women with first diagnosis of stage I or II breast cancer 100% women	Randomly assigned to: ▪ Expressive writing ▪ Benefit finding ▪ Control – neutral writing	4 x 20min writing sessions during 3 week period. ▪ EW – thoughts and feelings about experience with breast cancer ▪ BF – positive thoughts and feelings about experience with breast cancer ▪ C – facts regarding cancer and treatment Setting: home, laboratory or medical institution.	Physical and Psychological health: ▪ POMS, FACT* ▪ Negative somatic symptoms on Pennebaker measure* ▪ 3 month record of medical visits* ▪ COPE, IES* ▪ Manipulation check Follow-up: 1 & 3 months	EW participants reported fewer negative physical symptoms and had fewer medical appointmens for cancer-related morbidities than control participants at 3 month follow-up. BF participants fell between other 2 groups on somatic symptoms and had significantly fewer medical appointments than control participants. On psychological outcomes, EW was more effective for women low in cancer-related avoidance; BF was more effective for women high in avoidance.
Vedhara et al. (2007)	59 patients with psoriasis 54% men	Randomly assigned to: ▪ Expressive writing ▪ Control - neutral writing	4 x 20min writing sessions over consecutive days. ▪ EW – most traumatic experience of your life ▪ Control – time management Setting: home	Physical and Psychological Health: ▪ PASI ▪ DLQI* ▪ POMS* ▪ HADS* ▪ Manipulation check Follow-up: 2, 8 & 12 weeks	Disease severity and QoL improved in both EW and NW patients over follow-up period; magnitude of improvement comparable between groups. However, predictors of these changes differed.
Walker et al. (1999)	44 women with stage I or II breast cancer 100% women	Randomly assigned to: ▪ Expressive writing (1 session) ▪ Expressive writing (3 sessions) ▪ Control - usual care	1 x 30min writing session on final day of radiotherapy or day following final day. 3 x 30min writing sessions during final 5 days of radiotherapy. ▪ EW - thoughts and feelings regarding cancer experience ▪ Attentional control – talked with researcher about events/plans unrelated to cancer Setting: clinic and at home.	Psychological Health: ▪ PANAS* ▪ IES* ▪ Side Effect Severity Checklist* ▪ Writing analysed (LIWC) Follow-up: 1, 4-6, 16 and 28 weeks.	No main effects of condition or condition x time interactions on any dependent variable. No relationship between writing content changes and outcome measures. Linguistic change between writing sessions 1 and 3 in use of tenses and expression of affect.

Wetherell et al. (2005)	34 patients with rheumatoid arthritis 82% women	Randomly assigned to: ▪ Emotional disclosure ▪ Control - neutral writing/talking	4 x 20min sessions on consecutive days: ▪ ED – traumatic experience of choice ▪ NW – time management. (N.B. 7 verbally disclosed using tape recorder because of writing difficulties.) Setting: home	Physical and Psychological Health: ▪ Clinical status (self-report, physical examination and physiology measure) ▪ POMS* ▪ Emotional reactions to writing Follow-up: 1, 6 & 10 weeks	Beneficial effect of ED on mood outcomes, but not on clinical and physiological measures of disease activity. ED participants showed deterioration in several mood states at 1 week follow-up, but by 10 weeks showed significant improvements in several mood indices. Indices of disease activity showed little change in ED group and deterioration in control group.
Zakowski et al. (2004)	104 patients with prostate or gynaecological cancer (prostate 48%, uterine 18%, ovarian 14%, cervical 12%) 52% women	Randomly assigned to: ▪ Expressive writing ▪ Control - neutral writing	3 x 20min writing sessions on consecutive days or 3 days during 1 week period. ▪ EW – thoughts and feelings about cancer experience. ▪ NW – daily activities for 10/20 minutes (duration changed during study). Setting: home	Psychological Health: ▪ SCS* ▪ BSI * ▪ IES* ▪ Manipulation Check Follow-up: 6 months	Non-significant trend for main effect of experimental condition on distress. EW buffered the effects of social constraints on distress at 6 month follow-up, although it did not alter distress levels from clinical to nonclinical categories. Cognitive changes resulting from EW were explored as potential mediators. Participants with high levels of social constraint exhibited continued cognitive avoidance of cancer-related thoughts at follow-up, unless they were in EW condition.

Measures

AEQ - Ambivalence Over Emotional Expression Questionnaire
AIMS2 - Arthritis Impact Measurement Scale - 2
BASDAI - Bath Ankylosing Spondylitis Disease Activity Index
BASFI - Bath Ankylosing Spondylitis Functional Index
BAS-G - Bath Ankylosing Spondylitis Global Score
BDI - Beck Depression Inventory
BPI - Brief Pain Inventory
BSI - Brief Symptoms Inventory
CES-D - Centre for Epidemiological Studies Depression Scale
CLINHAQ - Clinical Health Assessment Questionnaire
COPE - Measure of coping processes
CSQ - Coping Strategies Questionnaire
DLQI - Dermatology Life Quality Index
FACT - Functional Assessment of Cancer Therapy Scale
FIQ - Fibromyalgia Impact Questionnaire
HADS - Hospital Anxiety and Depression Scale
IES - Impact of Events Scale
LIWC - Linguistic Inquiry Word Count
MHAQ - Modified Health Assessment Questionnaire
MPI - Multidimensional Pain Inventory
MPQ - McGill Pain Questionnaire
MOS - Medical Outcomes Study
PANAS - Positive and Negative Affect Schedule
PASI - Psoriasis Area and Severity Index
PHQ - Patient Health Questionnaire
POMS - Profile of Mood States
PSQI - Pittsburgh Sleep Quality Index
PSS - Perceived Stress Scale
QOL - Quality of Life Scale
SCL - Symptom Checklist
SCS - Social Constraints Scale
SF36/12 - measure of self-reported health status
SIP - Sickness Impact Profile
STAI - State-Trait Anxiety Inventory
STAXI - State-Trait Anger Expression Inventory

* = self-report measures

Cancer

Five randomised controlled studies have explored whether emotional expression through expressive writing has benefits for cancer patients. Two studies investigated the effects in breast cancer patients (Walker, Nail & Croyle, 1999; Stanton et al., 2002), one in renal cell carcinoma patients (De Moor et al., 2002), one in prostate cancer patients (Rosenberg et al., 2002) and one in prostate and gynaecological cancer patients (Zakowski, Ramati, Morton, Johnson & Flannigan, 2004). The participants in these samples were at different points on the cancer disease trajectory, including shortly after diagnosis (De Moor et al., 2002), the final days of radiotherapy treatment (Walker et al., 1999) and after active treatment had been completed (e.g. Zakowski et al., 2004). There was also variation in methodology regarding the type of control group, the writing 'dose' and follow-up periods. All studies measured psychological health outcomes and two studies (Rosenberg et al., 2002; Stanton et al., 2002) also included physical health outcomes.

Walker et al. (1999) found that neither a one nor three session dose of expressive writing during the final days of radiotherapy had a beneficial impact on the psychological health of breast cancer patients. The study compared expressive writing to a 'usual care' control group and measured participants' positive and negative affect, as well as intrusive and avoidant thoughts about cancer. The latter two outcomes were relevant because the end of treatment is a significant transition point and can often lead to intrusive thoughts and avoidant coping.

Stanton et al. (2002) investigated the effect of three different writing conditions on the physical and psychological health of breast cancer patients who had completed medical treatment. In addition to an expressive and neutral writing condition, a 'benefit-

finding' condition was included in which participants were asked to write about positive thoughts and feelings regarding their breast cancer experience. Expressive writing had a significant effect on physical health outcomes, with participants reporting fewer negative physical symptoms and fewer medical appointments for cancer-related morbidities at three month follow-up, compared to neutral writing participants. 'Benefit-finding' participants also had significantly fewer medical appointments than controls, demonstrating that two different writing interventions can produce similar benefits. There was no significant main effect of writing condition on psychological health outcomes.

Stanton et al. (2002) found that the effect of writing condition on psychological outcomes appeared to be moderated by participants' avoidance of cancer-related thoughts and feelings. In terms of psychological distress, expressive writing was more beneficial for patients low in avoidance at baseline and benefit-finding was more beneficial for patients high in avoidance.

Rosenberg et al. (2002) found that prostate cancer patients assigned to the expressive writing condition showed improvement in self-reported pain at follow-up, compared to non-writing controls. They found no improvements in quality of life or psychological symptoms and a non-significant reduction in health care utilisation. The study also measured immune functioning, since it is thought to play a role in the progression of cancer and expressive writing has been found to have a beneficial influence on immune function (Pennebaker, 1997). However, no significant immunologic improvements were found, which the authors believed was due to their selection of measurement techniques and immune markers.

The lack of improvement in psychological health outcomes was found in another prostate cancer study which also included patients with gynaecological cancer (Zakowski et al., 2004). The findings showed that participants' assignment to the expressive or neutral writing condition did not affect their reported distress at follow-up. The sample was relatively heterogeneous as it comprised patients with prostate, uterine, ovarian and cervical cancers, at different stages of the disease and having received different treatments. This may have introduced extraneous variables that influenced outcomes and reduced the study's ability to detect the impact of expressive writing.

Expressive writing appeared to be more effective at reducing distress in participants with high levels of social constraint, defined as "the perceived inadequacy of social support resulting in reluctance among individuals to express thoughts and feelings about a specific stressor" (Zakowski et al., 2004, p.556). It may therefore be a beneficial means of expressing emotions for people who perceive that they are unable to do so within their social network. Zakowski et al. (2004) also explored changes in cognitive avoidance between baseline and follow-up. Patients with high levels of social constraint continued to show avoidance of cancer-related thoughts and stimuli, unless they were assigned to the expressive writing condition. This suggests that changes in cognitive avoidance might play a mediating role in the relationship between expressive writing and distress.

De Moor et al. (2002) found that expressive writing had a beneficial effect on the sleep of renal cell carcinoma patients participating in a vaccine therapy trial. There were statistically significant differences between expressive and neutral writing participants on four sleep measures: total sleep disturbance, sleep quality, sleep duration and daytime dysfunction. Expressive writing did not have a significant impact on psychological

outcomes such as distress and mood disturbance, although it was found to increase levels of vigour as measured on the Profile of Mood States.

Several studies analysed the content of writing samples using the Linguistic Inquiry Word Count. De Moor et al. (2002) found significant differences between the experimental and control group's use of words related to affective and cognitive processing supporting the notion that expressive writing induces these processes. However, the study did not report whether these linguistic variables were related to health outcomes. Walker et al. (1999) found no significant relationship between participants' cognitive and affective word use and the study's psychological health outcomes. This is consistent with previous findings which suggest that these linguistic changes are more related to physical than psychological health measures (Pennebaker & Francis, 1996).

Summary and Conclusions

There is evidence for the beneficial effects of expressive writing on physical health outcomes in breast cancer, prostate cancer and renal cell carcinoma patients with respect to physical symptoms, health care utilisation and sleep (Stanton et al., 2002; Rosenberg et al., 2002; De Moor et al., 2002). However, the results for psychological health outcomes are less encouraging with studies either showing no significant effects (e.g. Walker et al., 1999) or benefits only in a subset of participants, such as those with high levels of social constraint (Zakowski et al., 2004). There are several issues relevant to this. First, two studies reported that participants' baseline scores on psychological health measures were "close to the ceiling" which would have made it difficult to detect any improvements (Walker et al., 1999; Stanton et al., 2002). Second, comparison across studies is problematic as studies use different psychological outcomes or use

different measures to measure the same construct. For instance, distress was used as a psychological outcome in four studies and yet each one used a different measure. Third, the mode of data collection may be important. One study collected follow-up data via telephone interviews rather than questionnaires (Walker et al., 1999). The participants' responses may have been more greatly influenced by social desirability which would have reduced the validity of the results. Finally, due to the wide variability in psychological adjustment found in these medical samples (e.g. Stanton et al., 2002) there may be more merit in investigating moderators of psychological health outcomes rather than simply main effects.

Rheumatoid arthritis and Ankylosing spondylitis

Three studies have investigated the effects of emotional disclosure in rheumatoid arthritis (RA) patients (Kelley et al., 1997; Broderick, Stone, Smyth & Kaell, 2004; Wetherell et al., 2005), one study in rheumatoid arthritis patients and asthma patients (Smyth, Stone, Hurewitz & Kaell, 1999) and one study in rheumatoid arthritis patients and lupus patients (Danoff-Burg et al., 2006). A study investigating its effects in patients with ankylosing spondylitis (AS) (Hamilton-West & Quine, 2007) is also included in this section as AS was historically considered a variant of RA and shares similar clinical symptoms. The mode of emotional disclosure varied across these studies, incorporating spoken, typed and handwritten disclosure, as the effects of rheumatoid arthritis can impair the ability to write. Previous research has indicated that both verbal and written modes of disclosure are effective and result in only marginally different outcomes (Esterling et al., 1994).

All of these six studies employed a fully randomised design and used neutral writing control groups. They all measured psychological, as well as physical health outcomes, except Smyth et al. (1999) who measured physical health outcomes only.

Kelley et al. (1997) investigated the effects of emotional disclosure via talking into a tape recorder. At three month follow-up, disclosure participants showed improvements on two self-report measures: affective disturbance and physical functioning. However, no benefits were found on the objective measure of physical health. It is possible that expectancy effects influenced outcomes. All participants were told the aim of the research project was to "investigate the effect of stress and emotion on the severity of rheumatoid arthritis" (Kelley et al., 1997, p.333) and that they would either be asked to talk about stressful life experiences or to describe neutral pictures. The disparity between these tasks made it likely that participants knew whether they were in the experimental or control condition, influencing the benefits they perceived it to have and consequently their responses on self-report measures. Consistent with Smyth (1998), disclosure was found to induce an initial increase in negative mood in RA patients. However, in contrast to Smyth (1998) this was found to be related to changes in health outcomes; larger increases in negative mood were related to greater improvement in an objective measure of joint condition.

Smyth et al. (1999) also found evidence for the benefits of expressive writing in RA patients. At 16 week follow-up, the experimental group showed clinically significant improvement in overall disease activity relative to neutral writing controls. This was measured by a rheumatologist, blind to experimental condition, conducting a structured interview with the participant and is therefore more reliable than a self-report measure. However, several different physicians carried out these evaluations and the

study's methodology could have been improved if inter-rater reliability had been measured and reported. The study also included participants with asthma; these results were analysed separately and will be described in the 'Asthma' section below.

Broderick et al. (2004) explored the feasibility and effectiveness of expressive writing conducted at home using videotaped instructions. RA patients were randomly assigned to one of two experimental conditions (expressive writing or 'enhanced meaning' writing) or one of two control conditions (neutral writing or an attention control group). Whilst showing that the intervention at home was feasible, no significant differences were found on any of the outcome measures at 4- to 6- month follow-up. One of the study's limitations is that a participant's inclusion in the 'protocol-adherent sample', on which these results are based, was solely determined by their self-reporting that they had watched the videotape and completed writing sessions. Adherence could have been more accurately assessed if participants' writing samples were also collected and analysed. Another limitation was that there were significant baseline group differences with respect to the disease activity rating.

Wetherell et al. (2005) also compared the effects of home-based expressive writing and neutral writing in RA patients. Seven of the 34 participants chose to disclose verbally due to difficulties with writing. Protocol adherence was encouraged via telephone calls from the researcher and participation was verified by collecting the writing samples. Another methodological strength of this study is that the disease activity outcome comprised a physical examination, as well as self-report and physiological measures. The disclosure group showed improvements in mood at 10 week follow-up, although these improvements were preceded by deterioration at earlier follow-up points. There was little change in disease activity in the disclosure group at

10 week follow-up, although there was deterioration in the control group. It is therefore possible that the control task, which involved participants writing about what they had done that day or were planning to do on subsequent days, had a deleterious effect. Control participants rated their writing as significantly less personal and emotional as disclosure participants, but it is still possible that this task was not genuinely 'neutral' in a population whose daily activities and plans are negatively impacted by their disease.

Danoff-Burg et al. (2006) had a mixed sample of lupus patients and RA patients who were randomised into one of three conditions: standard expressive writing, 'benefit-finding' writing and a neutral writing control. At three month follow-up, participants in the expressive writing and benefit finding conditions rated their fatigue levels as lower than control participants. The study also investigated the role of individual differences and found that trait anxiety moderated the effects of both writing interventions, but only with respect to pain levels. Expressive writing was found to be more beneficial in reducing pain for those with low trait anxiety and benefit finding for those with high trait anxiety. It is important to note that the only significant results emerged on pain and fatigue levels, measured by a simple visual analogue scale, despite the study's inclusion of well-validated outcome measures of disability, depression and positive mood. Another reason to interpret the findings with caution is that both these diseases are characterised by unpredictable episodes of painful joints and fatigue which may have confounded the results at follow-up. There are also differences between the diseases and it is therefore disappointing that the sample size did not allow the results for each disease to be analysed separately.

Hamilton-West and Quine (2007) found that expressive writing participants with AS showed improvements in functional status at three month follow-up compared to

neutral writing controls. There were no other significant main effects, although significant associations between the linguistic content of expressive writing samples and various health outcomes were found. For instance, improvement in disease activity was associated with an increase in positive emotion words and a decrease in particular negative emotion words between the first and third writing sessions.

Overall, this group of studies highlights the importance of having multiple follow-ups to determine the onset and the duration of expressive writing's benefits. Significant differences in two studies only emerged at longer-term and not short-term follow-ups (Kelley et al., 1997; Smyth et al., 1999) and Danoff-Burg et al. (2006) found a significant effect on pain at one month, but not at three month follow-up. Given these fluctuating patterns, it is important that studies not only have multiple but also fixed follow-up points. For instance, Kelley et al. (1997)'s 'three month' follow-up took place between one and six months post-intervention.

The challenges involved in designing a credible, yet genuinely neutral, control condition have also been raised by these studies. Kelley et al.'s (1997) study highlighted the potential influence that the control task can have on expectancy effects which in turn influence outcomes, particularly self-report measures. Methodological rigour is therefore enhanced by evaluating differences that may exist in participants' expectations across conditions.

Summary and Conclusions

There are some consistent and contradictory findings with regard to expressive writing's health benefits for patients with RA or AS. Four of the six studies found improvements in physical health measures at longer-term follow-up (Kelley et al., 1997; Smyth et al., 1999; Danoff-Burg et al., 2006; Hamilton-West & Quine, 2007). However,

Wetherell et al. (2005), who arguably used the most robust measure of physical health, did not find any improvements. Two studies found that an initial deterioration in psychological health was followed by a significant improvement at longer-term follow-up (Kelley et al., 1997; Wetherell et al., 2005). However, this was not replicated in the other studies.

Overall, the methodological quality of these studies was high. They all used a fully randomised design and a neutral writing control group. One study also included an attention control group (Broderick et al., 2004).

Asthma

Two studies have investigated the effects of expressive writing in adult asthma patients (Smyth et al., 1999; Harris, Thoresen, Humphreys & Faul, 2005). In both studies, participants were randomly assigned to either an expressive writing or neutral writing condition.

Smyth et al. (1999) found that asthma patients in the expressive writing condition showed clinically significant improvements in lung function at two week, eight week and 16 week follow-up, relative to neutral writing controls. This objective measure of disease status was a spirometry assessment conducted by a rater blind to experimental condition. As described previously, the study also found improvements in disease activity for RA patients in the expressive writing condition. However, it is worth noting that improvements in RA patients only appeared at the 16 week follow-up. This suggests that there may be different mechanisms of change responsible for expressive writing's benefits in asthma and RA patients. Alternatively, it may be that the contrasting nature and symptomatology of these two chronic medical conditions is responsible for the difference in when expressive writing's benefits emerged.

The improvements in lung function found by Smyth et al. (1999) were not replicated by Harris et al. (2005), who found no significant group differences on an identical measure of lung function at two month follow-up. Several methodological variations between the studies may account for this. First, the spacing of the writing sessions varied from consecutive days (Smyth et al., 1999) to once a week (Harris et al., 2005). However, this is unlikely to explain Harris et al.'s (2005) non-significant results as Smyth (1998) found that a longer time between sessions was positively related to overall effect size. Other differences include Harris et al. (2005) having more inclusive screening criteria and therefore a more heterogeneous sample. The reliability of Harris et al.'s (2005) results was also compromised by their lung function raters not being blind to experimental condition.

Summary and Conclusions

These two expressive writing studies not only focussed on the same clinical population, but also used the same outcome measure. They are well-designed studies producing robust, yet contradictory findings. The lack of consistency may be due to methodological differences, but it still raises doubt over whether expressive writing can induce physical health benefits in asthma patients.

Fibromyalgia

Two studies have investigated the effects of expressive writing in patients with fibromyalgia (Broderick, Junghaenel & Schwartz, 2005; Gillis et al., 2006). One study used a fully randomised design and included two control conditions: a neutral writing and usual care control (Broderick et al., 2005). The other study (Gillis et al., 2006) randomised separately for each sex (although only two of the seventy participants who

completed the intervention were men) and included a neutral writing control only. Both studies measured physical, as well as psychological health outcomes.

Broderick et al. (2005) randomised participants into one of three conditions: expressive writing, neutral writing and a usual care control group. The writing sessions were carried out in the private room of a laboratory at weekly intervals. At four month follow-up, expressive writing participants showed significant improvements in pain and fatigue compared to those in both control groups. There was also a significant group difference in psychological well-being, but this was due to deterioration in the control groups and only slight improvement in the expressive writing group. The significant effects were not present at 10 month follow-up and did not exist for other health indicators measured.

Gillis et al. (2006) randomised participants into either an expressive writing or neutral writing condition and instructed them to write on consecutive days at home. Their inclusion of one month and three month follow-up points produced interesting findings. At one month follow-up, the control group showed more improvements than the expressive writing group on negative affect and social support measures. These group differences disappeared by three months when the expressive writing participants showed improvement in global impact of fibromyalgia. There were also significant differences at this time point on poor sleep and health care utilisation, but these were related to an improvement in the expressive writing group and worsening by controls. Analyses revealed that the expressive writing group had poorer health at baseline than the control group. This is therefore a weakness of the study as the change in outcomes may have been influenced by participants' health at baseline.

Gillis et al. (2006) asserted that their results supported Broderick et al.'s (2005) findings based on the fact that both studies found health benefits of similar effect size. However, this is somewhat misleading and does not acknowledge the contradictory evidence produced by the two studies. For instance, Gillis et al. (2006) included measures of pain and fatigue but did not find significant results on these outcomes whereas Broderick et al. (2005) did. There was also inconsistency with regard to psychological health outcomes and the lack of improvements found by Gillis et al. (2006) is unlikely to be due to the setting, since disclosure at home has been found to be positively related to psychological health effect sizes (Frattaroli, 2006). It is also important to note that in both studies results appeared to show expressive writing's health benefits when in fact significant group differences resulted from deterioration in control participants. It is not clear whether this was due to the natural course of the disease, expectancy effects or the neutral writing condition having deleterious effects. Another limitation of the two studies was that only self-report measures were used.

Summary and Conclusions

Both of these two studies provide some evidence for the health benefits of expressive writing for patients with fibromyalgia. However, there were contradictory findings when the effects on particular health outcomes (such as pain and fatigue) were compared and the majority of significant differences resulted from deterioration in control groups. The authors therefore need to be cautious in claiming expressive writing's benefits from these studies. Both studies have methodological strengths, such as the inclusion of a neutral writing group, but Broderick et al.'s (2005) study has a more robust design as it included fully randomised assignment and two control groups.

HIV

Two studies have investigated the effects of expressive writing in adults with HIV infection (Petrie, Fontanilla, Thomas, Booth & Pennebaker, 2004; Rivkin, Gustafson, Weingarten & Chin, 2006). In both studies, participants were randomly assigned to either an expressive writing or neutral writing condition.

Petrie et al. (2004) found that expressive writing resulted in a significant increase in CD4+ lymphocytes during the six month follow-up period, indicating an improvement in immune response. No sustained change was found in HIV viral load, which was a second objective measure of disease activity.

Rivkin et al. (2006) explored expressive writing's effects on psychological as well as physical health, and also investigated potential mediators. Their findings conflicted with those of Petrie et al. (2004), as the writing condition did not have a significant effect on immune function (as measured by beta2-microglobulin) or depression during the six month follow-up period. However, linguistic analysis of the writing samples produced some interesting findings. For instance, expressive writing participants who used increasing causation and insight words over successive writing sessions had better immune function at follow-up. This is consistent with previous studies linking the cognitive processing of emotions with improved physical health at follow-up (e.g. Pennebaker & Francis, 1996) and provides evidence for the 'cognitive adaptation' theory.

It is important to highlight this study's contradictory findings with respect to participants' adherence to the writing instructions. There were no significant differences between how expressive writing and neutral writing participants rated the degree to which their writing was emotional and personal. In contrast, the 'Linguistic Inquiry and

Word Count' analysis revealed that, as expected, expressive writing participants used significantly more affect words, positive emotion words, negative emotion words and cognitive mechanism words. This discrepancy raises concern about the validity of the control condition and the study's findings with respect to group differences. However, more importantly, it highlights the challenge involved in measuring participants' conformity to writing condition, which is fundamental to expressive writing research. The majority of studies rely on a self-report manipulation check which may not be a very accurate method of doing this.

In addition to the issue raised above, several factors could explain why Rivkin et al. (2006) did not replicate Petrie et al.'s (2004) findings of immune function benefits. First, the studies used different measures of immunity and Rivkin et al. (2006) suggested that their measure may have been less sensitive. Second, Rivkin et al. (2006) found that at baseline, many participants reported high levels of social support and reported having already talked a 'moderate' amount about their feelings about HIV. Third, Petrie et al. (2004) allowed participants to choose the traumatic experience rather than specifying that they write about their experience of being HIV positive. Fourth, it may be that the higher proportion of male participants in the Petrie et al. (2004) study was responsible for the difference, as this has been found to be a significant moderator of expressive writing's effects (Smyth, 1998; Frattaroli, 2006). However, this seems unlikely since Rivkin et al. (2006) found no differences in the effectiveness of expressive writing between male and female participants in their study.

Summary and Conclusions

These two studies provide conflicting evidence as to whether expressive writing produces physical health benefits for adults with HIV infection. There was no evidence

of improvements to psychological health, although this was only measured by one of the studies (Rivkin et al., 2006). The use of randomised assignment and neutral writing control conditions ensured a degree of experimental rigour in both studies. However, the limitations outlined above weaken the quality of evidence provided by Rivkin et al. (2006) in particular.

Surgery

Two studies have investigated the effects of expressive writing on the post-operative course of patients undergoing urology surgery: one involved intraurethral resection of a bladder papilloma (Solano, Donati, Pecci, Persichetti & Colaci, 2003) and the second transurethral resection of the prostate (Solano et al., 2007). Participants were assigned to either an expressive writing condition, in which they wrote for three days prior to surgery, or a non-writing control group. Assignment was made to ensure that participants in each condition were as closely matched as possible on key independent variables.

Solano et al. (2003) found that expressive writing participants had a more favourable post-operative course, in terms of length of hospital stay and their self-reported psychological well-being. The study also found that participants' alexithymia level at baseline moderated the effects of expressive writing. Expressive writing's benefits only existed in high alexithymia participants (those with poor capacity for processing, identifying and verbally expressing emotion) and not in low alexithymia participants.

Solano et al. (2007) also focussed attention on individual differences and investigated the extent to which a participant's level of surgical risk, which was used as an indicator of distress level, impacted on the effects of expressive writing. 'Low risk'

participants in the expressive writing condition left hospital one day earlier than their non-writing counterparts and also had more beneficial outcomes with respect to subjective well-being and the physician's rating of post-operative course. In contrast, expressive writing appeared to have a detrimental, albeit non-significant, effect on all three health outcomes in 'high risk' participants. Solano et al. (2007) suggest that their findings support an emerging hypothesis in the literature that the "level of distress at the moment of writing is highly relevant in moderating the effects of writing disclosure" (p.365).

One methodological limitation of these studies is the use of a non-writing control group. This makes it impossible to attribute any benefits found to expressive writing, as other factors associated with the intervention, such as writing per se and spending time in a quiet room were not controlled for. The fact that neither study employed a randomised design is another limitation. However, the authors argue that their method of assignment, which ensured the highest possible similarity between the writing and non-writing group on key independent variables, compensated for this. The studies would have been enhanced by the inclusion of further follow-ups, as it is unclear whether beneficial health effects persisted beyond the participant's hospital stay.

Summary and Conclusions

Expressive writing whilst in hospital awaiting surgery may have health benefits for certain patients: those high in alexithymia (Solano et al., 2003) and those rated as having a low surgical risk (Solano et al., 2007). Benefits were found in objective physical health parameters, subjective self-reports of psychological well-being and length of hospital stay. However, the studies' methodological limitations preclude the conclusion that expressive writing is responsible for these benefits. It is also important to

note that expressive writing may be contraindicated for certain populations, such as those undergoing high-risk surgery (Solano et al., 2007).

Other Medical Conditions

Individual studies have explored the effects of expressive writing on three medical conditions: chronic pelvic pain (Norman, Lumley, Dooley & Diamond, 2004), psoriasis (Vedhara et al., 2007) and elevated blood pressure (McGuire et al., 2005). In all three studies, participants were randomly assigned to either the intervention or control condition. Two studies used a neutral writing control in which participants wrote an objective account of how they spent their time (McGuire et al., 2005; Vedhara et al., 2007) and one study used a positive writing control in which participants wrote about positive emotional experiences (Norman et al., 2004). All studies measured physical health outcomes and two of the studies also measured psychological health outcomes (Norman et al., 2004; Vedhara et al., 2007).

One study explored the effects of expressive writing in patients with chronic pelvic pain by comparing it to a positive writing control (Norman et al., 2004). A significant main effect of expressive writing was found on only one pain dimension, despite the inclusion of other physical and psychological health measures. The study particularly focussed on individual differences and found that 'ambivalence over emotional expression', 'catastrophizing' and 'negative affect' at baseline moderated the effects of expressive writing.

Vedhara et al. (2007) investigated the effects of expressive writing in patients with psoriasis. Disease severity and quality of life improved in both the expressive writing and neutral writing groups during the 12 week follow-up period. There are several possible reasons for this, including beneficial effects of the neutral writing task

per se or other aspects of the study protocol experienced by control participants such as regular contact with a researcher. The inclusion of a non-writing control would have helped to clarify this. The benefits in the two writing groups were predicted by different factors, for instance disease severity improvement was predicted by changes in mood in expressive writing participants, but not in control participants. This suggests that different mechanisms may underlie the improvements in each group and changes in mood may be part of the mechanism of change responsible for expressive writing's effect on psoriasis severity.

One study explored the effects of expressive writing in participants with elevated blood pressure (McGuire et al., 2005). Systolic and diastolic blood pressure significantly decreased between baseline and one month follow-up in expressive writing participants, but this was not maintained at four month follow-up. Anger suppression, the extent to which an individual does not express his anger in anger arousing situations, moderated the effects of expressive writing on diastolic blood pressure at four month follow-up. Diastolic blood pressure decreased in expressive writing participants with high levels of anger suppression and increased in participants with low levels of anger suppression.

Summary and Conclusions

There is some evidence for the health benefits of expressive writing in patients with chronic pelvic pain and elevated blood pressure (Norman et al., 2004; McGuire et al., 2005) but not in patients with psoriasis (Vedhara et al., 2007). The methodological rigour of these three studies was generally high and the inclusion of individual difference measures in two of them (Norman et al., 2004; McGuire et al., 2005) made it possible to identify moderators.

Discussion

These studies provide some empirical support for the health benefits of expressive writing in medical populations. However, research is still in its infancy as the effect of expressive writing on people with particular medical conditions has only been investigated by one or two individual studies, with the exception of cancer and rheumatoid arthritis. These findings will be summarised before issues related to research design, measurement of outcome and the nature of the writing intervention are discussed. The section will conclude with directions for future research and clinical implications.

Effects of expressive writing

Fifteen of the 21 studies reviewed found a significant main effect of expressive writing on health outcomes such as pain, sleep, health care utilisation and objective measures of disease activity. Benefits occurred particularly in the physical health domain, although improvements were also found on some psychological health indicators such as mood. However, a significant result was often only found on one of many measures included in a study or on only one dimension of a measure. Effect sizes were only reported in a minority of studies. Individual differences, such as alexithymia, were found to moderate expressive writing's effects and in some cases accounted for the main effect. This challenges the notion that expressive writing has universal benefits. It is also important to note that in one study expressive writing appeared to have a detrimental impact on health and may therefore be contraindicated for certain medical populations.

Research design

Nineteen of the 21 studies employed randomised, or partially randomised, designs and all studies assigned participants to an experimental or control condition. There is ongoing debate about the nature of control conditions employed in this body of research. The majority of studies have used a neutral writing control (e.g. De Moor et al., 2002) which is more robust than a non-writing control used by others (e.g. Walker et al., 1999). Different types of neutral writing tasks have been devised which include asking participants to write about how they spend their time (e.g. Hamilton-West & Quine, 2007) or about the facts of their medical condition (e.g. Stanton et al., 2002). However, in medical populations it could be argued that it is not possible for a participant to write about a disease they suffer from in a non-emotional way. Norman et al. (2004) argued that a neutral writing task does not control for writing about emotionally engaging topics and consequently chose to use a positive writing control. This is similar to a benefit-finding condition which was found by two studies to produce similar health benefits to expressive writing (Danoff-Burg et al., 2006; Stanton et al., 2002). This highlights the immense challenge involved in designing appropriate control conditions and also shows the extent to which the choice of control condition influences a study's results.

Measurement of outcome

A variety of self-report, clinician-report and objective measures of physical health were used. The most robust physical health indicators used in these studies comprised all three measurement types (e.g. Wetherell et al., 2005). Psychological health indicators were all self-reported. Overall, the outcome measures chosen were appropriate and well-validated. However, comparison across studies is difficult when

different constructs are measured and when different measures are used to assess the same constructs. For example, Solano et al. (2003) used the Symptom Check List to measure psychological well-being, whereas Broderick et al. (2005) used the Quality of Life Scale, the State-Trait Anxiety Scale and the Beck Depression Inventory. This was also an issue in the two studies on HIV patients (Rivkin et al., 2006, Petrie et al., 2004) as it was unclear whether their inconsistent findings were due to the use of different measures of immune functioning or the lack of a genuine effect of expressive writing.

There was also considerable variety in the timing of follow-up periods ranging from several days (e.g. Solano et al., 2007) to 10 months (Broderick et al., 2005). Some health benefits emerged at later follow-ups and not earlier ones (e.g. Stanton et al., 2002), whereas other initial improvements were not maintained in the longer term (e.g. Danoff-Burg et al., 2006). The inclusion of multiple follow-ups is important as it enables the onset and duration of benefits to be more clearly understood.

Nature of intervention

While all studies used the Pennebaker and Beall (1986) expressive writing paradigm there was still variation in the nature of the intervention. For instance, the duration of the writing sessions varied across studies although all sessions lasted for at least 15 minutes. Twelve of the 21 studies reviewed conducted writing sessions on consecutive days, while others occurred during one week or at approximately one week intervals. Writing sessions took place at the participant's home, a hospital clinic or research laboratory. It is important to note that the location and spacing of writing sessions are factors that have been found to moderate expressive writing's effects (Smyth, 1998; Frattaroli, 2006).

Some studies followed Pennebaker's expressive writing instructions allowing participants to choose the traumatic experience they wrote about (e.g. Petrie et al., 2004) while others specifically asked them to write about their experience of having the disease (Rivkin et al., 2006). There is no clear evidence as to which is more beneficial in medical populations, although writing about current traumas appears to produce greater psychological well-being effect sizes in healthy populations (Smyth, 1998). Some authors have argued that it is probably better not to assume which experience is most traumatic for a patient and to allow them to choose (Sloan & Marx, 2004), whereas others have argued that being specific encourages a much-needed opportunity for emotional disclosure about the disease (Norman et al., 2004). Broderick et al. (2005) changed the expressive writing instructions across successive writing sessions to encourage emotional expression and cognitive reappraisal of the traumatic event. Unfortunately, it was not possible to assess the effect of this, as writing samples were not linguistically analysed, nor was a writing group included for whom the instructions did not change.

Future research

These expressive writing studies are generally of a high quality and have methodological strengths, such as the use of randomised designs, comparison groups and standardised outcome measures. Although they have significantly increased our understanding of the efficacy of expressive writing in medical populations over the last 10 years, further research is needed. For many medical conditions such as asthma, only two expressive writing studies have been conducted and they have produced contradictory findings (Smyth et al., 1999; Harris et al., 2005). Additional studies for each disease type, with rigorous designs and larger sample sizes, will enhance this body

of research. Individual differences have been found to moderate health outcomes (e.g. Stanton et al., 2002; Zakowski et al., 2004) and it is therefore too simplistic for research in the expressive writing field to ask "is it effective?". Instead the question should be "for whom is it effective?" with future research focussing on identifying moderating variables. Finally, it is important that studies also investigate mediating variables to help solve the ongoing theoretical puzzle about how expressive writing works.

Clinical implications

Expressive writing is a simple, low-cost and easy-to-administer psychological intervention. It has the flexibility to be used in clinical settings and its feasibility as a home-based intervention has also been shown (e.g. Broderick et al., 2004). Expressive writing can be used as a stand-alone intervention or as an adjunct to other psychological interventions (Pennebaker, 2004). An email based expressive writing intervention has been found to be effective in producing positive health outcomes (Sheese, Brown & Graziano, 2004) which suggests that the internet may provide additional opportunities for its clinical use.

Expressive writing has been found to improve the health of patients with a variety of medical conditions, ranging from those with a low risk of mortality such as rheumatoid arthritis, to those with a high risk of mortality such as cancer. If future research replicates these findings, expressive writing has the potential to be widely used as a therapeutic tool across different medical populations.

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Part 2: Empirical Paper

Effects of Expressive Writing on Physical and Psychological Symptoms in Women Undergoing Surgery for Gynaecological Cancer

Abstract

Previous research suggests that expressive writing can have physical and psychological health benefits in medical populations. This exploratory study investigated whether these benefits exist for patients undergoing major surgery for gynaecological cancer. Participants were randomly assigned to an expressive writing condition, in which they wrote about their illness, or a neutral writing (control) condition, in which they wrote a factual account of life on the ward. Twenty participants wrote for 20 minutes on three or four consecutive days during their hospital stay following surgery. Health outcomes included self-reported physical and psychological symptoms of sleep, pain and mood. No main effect of expressive writing was found on any of the outcome measures. The feasibility of the intervention and limitations of the study are discussed.

Introduction

A diagnosis of cancer is typically viewed as a catastrophic event in a person's life due to the life threatening nature of the disease and the burden of invasive treatment. A common psychological reaction is shock and disbelief followed by anxiety, anger, guilt and depression (Moorey & Greer, 2002). Cancer diagnosis and treatment affects numerous areas of an individual's life, including their employment, relationships and domestic life, and this naturally requires a period of considerable adjustment (Brennan, 2004).

In England and Wales, gynaecological cancers (i.e. cancers of the ovary, endometrium, cervix, vulva and vagina) are among the most common cancers in women after breast, lung and bowel cancer (Department of Health, 1999). However, in contrast to breast cancer, there is only a small body of research focussing on the psychosocial issues and needs of these patients. In one study, 81% of women with gynaecological cancer reported that psychosocial difficulties were their main problems at diagnosis and treatment and identified depression, anxiety and fear of dying as the most common of these (Steginga & Dunn, 1997). The treatment for gynaecological cancer often involves a combination of surgery, chemotherapy and radiotherapy and it can be the treatment rather than the disease itself that causes most distress. Patients treated surgically for gynaecological cancer have been found to be at increased risk of psychosocial difficulties (Chan et al., 2001). This is believed to be related to women's beliefs about the organs that are commonly removed in surgery which often represent femininity, motherhood and sexuality. Other issues pertinent to this group of cancers relate to common treatment sequelae which include treatment-related menopause, impaired or lost fertility and sexual dysfunction (Auchincloss, 1995).

The importance of addressing the psychosocial needs of cancer patients is well-recognised (NICE, 2004). The most effective means of doing this for gynaecological cancer patients is not yet known as research is still in its infancy. Several studies have focussed on the role of medical professionals. A retrospective study showed that 73% of gynaecological cancer patients felt that physicians should take an active role in addressing psychosocial concerns by asking patients if they needed help with their emotional needs (Miller, Pittman & Strong, 2003). Evidence from a prospective study suggested that support from a Clinical Nurse Specialist at the time of diagnosis may assist the psychological recovery of patients and reduce their levels of distress (Booth, Beaver, Kitchener, O'Neill & Farrell, 2005). Only a very small number of studies have investigated psychological interventions and, overall, have found mixed results. For instance, a 12-week group therapy intervention produced promising findings in terms of improvements in sexual functioning and mood (Caldwell et al., 2003), although an individual psychotherapy intervention had no significant effect on quality of life and psychological status (Chan et al., 2005). Clearly more research in this area is needed.

One promising psychological intervention which has received only limited research attention with cancer patients is 'expressive writing'. Developed by Pennebaker and Beall (1986), this involves people writing down their "deepest thoughts and feelings" about a stressful life experience for 20 minutes on three to five consecutive days. A large body of research, mostly with non-clinical populations, has found that expressive writing (compared to a 'neutral writing' control condition) leads to improvements on objectively assessed health outcomes (e.g. illness-related visits to the doctor and immune system functioning), self-reported physical health outcomes (e.g. physical symptoms and number of days affected by illness) and self-reported emotional

health outcomes (e.g. mood and psychological well-being) (Baikie & Wilhelm, 2005). Three main theories have been proposed to explain the benefits of expressive writing and each cites a different mechanism of change: the disclosure of once-inhibited feelings ('emotional inhibition'), the cognitive processing of a stressful experience ('cognitive adaptation') and the exposure to previously avoided stimuli ('exposure/emotional processing'). There is supportive, as well as contradictory, evidence for each of these theories and it is likely that one single theory cannot fully explain the effects of expressive writing (Sloan & Marx, 2004).

Although expressive writing research originally focussed on non-clinical populations, more recent research has suggested it also has health benefits for physically ill populations (Frisina, Borod & Lepore, 2004). Studies have included participants with a broad range of medical conditions, such as cancer (e.g. Stanton et al., 2002), rheumatoid arthritis (e.g. Kelley, Lumley & Leisen, 1997), asthma (e.g. Harris, Thoresen, Humphreys & Faul, 2005), fibromyalgia (e.g. Broderick, Junghaenel & Schwartz, 2005), HIV (e.g. Petrie, Fontanilla, Thomas, Booth & Pennebaker, 2004), chronic pelvic pain (Norman, Lumley, Dooley, & Diamond, 2004), psoriasis (Vedhara et al., 2007), elevated blood pressure (McGuire, Greenberg & Gevirtz, 2005) and patients undergoing surgery (e.g. Solano, Donati, Pecci, Persichetti, & Colaci, 2003).

A small number of studies have investigated the effects of expressive writing for cancer patients and have focussed on breast cancer patients (Walker, Nail, & Croyle, 1999; Stanton et al., 2002), renal cell carcinoma patients (De Moor et al., 2002), prostate cancer patients (Rosenberg et al., 2002; Zakowski, Ramati, Morton, Johnson & Flanigan, 2004) and gynaecological cancer patients (Zakowski et al., 2004). Expressive writing has been found to improve physical health outcomes in terms of health care

utilisation, pain and sleep (Stanton et al., 2002; Rosenberg et al., 2002; De Moor et al., 2002). For instance, De Moor et al. (2002) found significant differences between renal cell carcinoma patients assigned to the expressive and neutral writing condition on four sleep measures: total sleep disturbance, sleep quality, sleep duration and daytime dysfunction. The results for psychological health outcomes in cancer patients have been mixed with some studies showing no significant effect on quality of life or mood (e.g. Walker et al., 1999) or a significant effect on only some scales or for only a sub-group of participants (e.g. De Moor et al., 2002).

The empirical evidence suggests that expressive writing does not have universal benefits and that future research should focus on establishing which patients are most likely to benefit. Some studies have begun to identify individual characteristics that appear to moderate expressive writing's effects (for a review, see Frattaroli, 2006). For instance, people differ in the degree to which they inhibit, or have difficulty with, emotional expression and Solano et al. (2003) found that expressive writing only benefited high alexithymia participants, i.e. those with a poor capacity for processing, identifying and verbally expressing emotion. Expressive writing may also be more effective for people who have limited opportunities to talk about their concerns with people close to them. For instance, expressive writing was found to be more effective at reducing distress in participants with high levels of social constraint, defined as "the perceived inadequacy of social support resulting in reluctance among individuals to express thoughts and feelings about a specific stressor" (Zakowski et al., 2004, p.556). Expressive writing may therefore be particularly beneficial for people who have more difficulty expressing their emotions or who perceive that they are unable to do so within their social network.

As well as clarifying which cancer patients are most likely to benefit from expressive writing, research is needed to investigate whether a participant's point on the disease trajectory at the time of expressive writing moderates its effects. Participants in studies to date have been at various stages of cancer treatment (e.g. De Moor et al., 2002; Walker et al., 1999), although most had completed treatment up to several years previously (e.g. Rosenberg et al., 2002).

The present study aimed to investigate whether expressive writing could be of benefit to women recovering from surgery for gynaecological cancer. Although Zakowski et al.'s (2004) study included women with gynaecological cancer as participants, its mixed sample, which also included prostate cancer patients, made it impossible to assess the effects on gynaecological cancer patients alone. Furthermore, the participants in Zakowski et al.'s study had already completed active cancer treatment. The present study focused on the post-operative period for several reasons. First, this point in the cancer trajectory can be particularly distressing for patients as it is often the first stage of treatment soon after diagnosis. In addition, hospitalisation itself is a stressful experience involving challenges for the patient that include painful, unpleasant and life-threatening procedures, loss of control and privacy and the unfamiliarity of the hospital environment (Brennan, 2004). Second, research in the urology field suggests that expressive writing may improve post-operative recovery in terms of objective physical health parameters, subjective self-reports of psychological well-being and length of hospital stay (Solano et al., 2003; Solano et al., 2007). Sleep and pain were chosen as the physiological measures in this study as improvements in sleep and reductions in pain have been found in previous expressive writing studies (e.g. De Moor et al., 2002) and are particularly relevant to post-operative cancer patients. For

example, 30 - 50% of newly diagnosed or recently treated cancer patients report sleep difficulties (Savard & Morin, 2001) and sleep patterns are severely disrupted in post-operative patients (Kehlet, 1997).

The original aims of the present study were to investigate: (1) the effects of expressive writing on self-reported sleep, pain and mood post-surgery, and (2) whether certain patient characteristics were associated with greater benefit, in particular whether patients high on emotional control and social constraints were more likely to benefit. However, due to recruitment difficulties and a subsequent small sample size, the second aim could not be addressed. The study was therefore re-conceptualised as an exploratory study to investigate the feasibility and outcomes of expressive writing as a psychological intervention following major surgery.

Method

Design

Participants were randomised to an expressive writing condition or a neutral writing (control) condition. The writing sessions took place over three to four days on a hospital ward and measures were collected at baseline, one-week and five-week follow-up points. Five weeks was chosen as the second follow-up point because the expressive writing literature suggests that benefits typically emerge at least several weeks following the intervention. However, it was not extended beyond five weeks to reduce the likelihood of participants having further medical treatment during the follow-up period. The study was part of a larger expressive writing study which investigated a range of health outcomes (Delmar-Morgan, 2008), as well as the nature of the writing samples (Thomas, 2008).

Participants

Eligibility criteria

Women undergoing major surgery at a London hospital for gynaecological cancer (or suspected gynaecological cancer) were eligible for the study. The original inclusion criterion was a diagnosis of ovarian or endometrial cancer, but because of recruitment difficulties this was subsequently extended to include any form of gynaecological cancer. Other inclusion criteria were being at least 18 years old and having an expected hospital stay of at least seven days. Exclusion criteria were having a serious mental health problem or learning disability, being unable to read or write fluently in English and having sensory or cognitive impairments that made completing the baseline questionnaires impossible.

Recruitment

Prior to hospital admission, women were given a leaflet about the study in an information pack at a routine Clinical Nurse Specialist appointment. The timing of this varied, but was approximately one week before surgery. Leaflets and posters outlining the study were also displayed on the hospital ward. The surgery list was reviewed with a ward nurse every week to identify the patients who met the study's eligibility criteria.

Participants

One hundred and twelve patients met the eligibility criteria; of these 39 completed baseline questionnaires and 20 completed three or more writing sessions. Further details on the flow of participants through the study and sample characteristics are provided in the Results section.

Ethics Approval

Ethics Approval was gained from the local Research Ethics Committee (see letter in Appendix 2).

Procedure

Patients were admitted to hospital one day prior to surgery and those who met the eligibility criteria were approached by a researcher on the ward. They were given the Participant Information Sheet (Appendix 3) to read and had the opportunity to ask any questions related to the study. They were informed that the study's purpose was "to find out whether and how keeping a brief diary for four days might benefit women who are recovering from surgery for gynaecological cancer." Written consent (Appendix 4) was obtained from those interested in participating and baseline questionnaires were completed.

On the second or third day after surgery, the participant was approached by the researcher to confirm that she still wished to take part in the study and that she was physically able to complete the writing task. Participants were randomly assigned to either the expressive writing or neutral writing condition immediately before the writing task began. A member of the research team who had no contact with participants generated a random allocation sequence and gave each researcher a set of sequentially numbered envelopes containing instructions for the assigned writing condition. Writing instructions were sequenced using randomly permuted blocks of four to ensure equal numbers of participants in each condition. The instructions were in a sealed envelope so that neither the researcher nor the participant knew which condition the participant would be assigned to. Once the envelope was opened, the researcher was not blind to

condition as she needed to be available to answer any questions the participant had regarding the instructions.

Participants in the expressive writing condition were asked to write about their deepest thoughts and feelings regarding their illness or surgery. This is consistent with other expressive writing studies with cancer patients (e.g. Stanton et al., 2002), in which participants are instructed to write about their illness, rather than a traumatic experience of their choice. Participants in the neutral writing condition were asked to write a factual, non-emotional account of life on the ward during the last 24 hours. Typically, expressive writing studies ask control participants to write about how they have used their time that day. Since participants in this study were spending all day in bed it seemed more appropriate to ask them to describe what they observed happening on the hospital ward. Full instructions for both conditions are in Appendix 5. All participants were instructed to write for 20 minutes on four consecutive days. However, 11 of the 20 writing participants only wrote for three days because they were discharged from hospital before being able to complete a fourth session. Writing sessions took place on the ward; participants were in their hospital bed with the curtain drawn around them to ensure some degree of privacy.

At the start of each writing session, participants completed brief sleep and pain measures. At the end of the writing session, participants completed a manipulation check by rating how personal their writing was and how much they revealed their emotions (see Measures section). The researcher monitored these ratings and re-iterated the instructions on subsequent writing sessions to encourage adherence to them. Participants put their writing sample and the self-report measures in a sealed envelope

which was collected by a researcher. All writing samples and questionnaires were identified by a code number only.

Since short-term distress can sometimes be caused by the expressive writing task (Smyth, 1998), a protocol was implemented to manage this. A researcher was present at the beginning and end of each expressive writing participant's writing sessions to monitor signs of distress and provide support as appropriate. Ward nursing staff were aware of which patients were participating in the study and were able to provide support when the researcher was not present. Participants were able to contact the research team directly via telephone and if any patient seemed highly distressed it was possible to refer her to the department clinical psychologist. When appropriate, participants were reminded of their option to withdraw from the study at any time.

After the final writing session, participants were given questionnaire packs to complete at one-week and five-week follow-up; stamped, addressed envelopes were provided. Participants also received a telephone reminder from a researcher to complete these.

Measures

Self-report measures of sleep, pain and mood were completed at baseline (the day before surgery) and one-week and five-weeks following completion of the writing task. At baseline, demographic data was collected and self-report measures of social constraints and emotional control were completed. Sleep and pain measures were also administered at the beginning of each writing session. Additional measures were included as part of another study (Delmar-Morgan, 2008); these are not reported here.

Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk & Berman, 1989)

The PSQI measures sleep quality and disturbances over the preceding month. It contains 9 questions which have a variety of response scales. A global score and seven subscale scores are produced: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction. Global scores range from 0 (indicating no difficulty) to 21 (indicating severe difficulties in all areas). The scale has good internal consistency (Cronbach's α = 0.83) and test-retest reliability (r=0.85) (Buysse et al., 1989). The validity of the measure has been supported by, for example, its ability to discriminate between "good" and "poor" sleepers (Buysse et al., 1989). This measure has been used in another expressive writing study with cancer patients (De Moor et al., 2002).

In order to assess sleep quality over the course of the writing intervention, a briefer version of the PSQI was used which measured the previous night's sleep. It comprised three questions corresponding to the sleep duration, sleep disturbances and sleep quality subscales. The response categories were amended in order to make them appropriate for sleep during the previous night, rather than the previous month. The measure was administered on the day of each writing task, as well as at baseline and follow-up, to allow comparison of nightly sleep quality.

Brief Pain Inventory (BPI; Cleeland & Ryan, 1994)

The BPI, short form, is an 11-item rating scale developed for cancer patients to assess severity of pain (4 questions) and the impact of pain on daily functions (7 questions). In this study, five questions relevant to post-surgical patients were used: four questions that comprise the pain severity subscale and one question from the other subscale relating to pain medication. The severity subscale of this measure has been

used in another expressive writing study with cancer patients (Rosenberg et al., 2002). Each item uses a 10-point Likert scale from 0 (no pain) to 10 (pain as bad as you can imagine). The severity subscale items include asking patients to rate their pain at its worst and least in the last 24 hours. The mean of the four severity items can be used as a composite measure of pain severity.

The measure has acceptable reliability (Cronbach alpha coefficients 0.77-0.91) and has been "validated by examining the consistency of its two-factor structure: severity and impact of pain" (Rosenberg et al., 2002, p.44).

Profile of Mood States (POMS; McNair, Lorr & Droppleman, 1971)

The POMS was chosen as the measure of mood as it has been used in other expressive writing studies with cancer patients (e.g. De Moor et al., 2002; Rosenberg et al., 2002, Stanton et al., 2002) and is a measure of positive and negative affect. It asks respondents to rate how they have been feeling over the past week using 65 mood adjectives. Items are rated on a five-point Likert scale from 0 (not at all) to 4 (extremely). Six subscale scores are yielded (tension, depression, anger, vigour, fatigue and confusion) and an overall distress index can be calculated by summing items on the highly correlated anger, depression, tension, fatigue and confusion subscales (Stanton et al., 2002).

The measure has good internal consistency (coefficients of 0.88-0.95) and good test-retest reliability (r=0.65-0.74) considering it measures a fluctuating state like mood (McNair et al., 1971). Its validity is well-established; for instance, POMS scores are highly correlated with other measures of distress (e.g. Hopkins Symptom Distress Scales) demonstrating its concurrent validity (McNair et al., 1971).

Social Constraints Scale (SCS; Lepore & Ituarte, 1999)

The SCS assesses perceived inadequacy of social support which results in an individual being reluctant to disclose their thoughts and feelings about a stressful experience such as cancer. It can be completed in relation to a partner, friend or family member and example items include "How often did they make you feel as though you had to keep your feelings about your cancer to yourself, because they made him/her feel uncomfortable?". Each item is rated on a four-point scale from 1 (never) to 4 (often).

Previous research has shown the scale has good internal consistency (Cronbach α=0.85-0.95), test-retest reliability (r=0.69-0.71) and evidence has been provided for its construct, predictive and convergent validity (Lepore & Revenson, 2007). The measure has been used in another expressive writing study with cancer patients (Zakowski et al., 2004).

The SCS was modified for the present study. Since participants were completing a large number of questionnaires at baseline, it was desirable to use a shorter version. A brief, eight-item version of the questionnaire was therefore used with the possible total score ranging from 8 (low social constraints) to 32 (high social constraints). Internal consistency was calculated for the present sample and was found to be in the acceptable range (alpha coefficient=0.77).

Courtauld Emotional Control Scale (CECS; Watson & Greer, 1983)

The CECS is a 21-item questionnaire, in three sections, which assesses the extent to which individuals suppress the expression of anger, anxiety and depression. For instance, one item on the anger subscale asks people how often they 'keep quiet' or 'bottle it up' when they feel angry. Items are rated on a four-point Likert scale from 1 (almost never) to 4 (almost always). Total scores range from 21 to 84 with higher scores

indicating greater suppression of emotion. Each subscale has good internal consistency (alpha coefficients of 0.86-0.88) and high test-retest reliability (r=0.95 for total score). Scores on the three sections are significantly positively correlated "providing support for its validity as a measure of a general construct of emotional control" (Watson & Greer, 1983; cited in Johnston, Wright & Weinman, 1995, p.14).

Demographic Questionnaire

A questionnaire with nine questions was included which collected participant demographic data as well as information about other medical conditions.

Manipulation Check

After each writing session, participants rated how personal their writing was and how much they revealed their emotions in it, on seven-point Likert scales from 1 (not at all) to 7 (a great deal). These questions were used by Stanton et al. (2002) and other expressive writing studies with cancer patients have used similar measures.

Power Analysis

The intended sample size was 52 (26 in each condition). This was determined by a power calculation (power=0.80, α=.05) based on large effect sizes found in previous expressive writing studies with cancer patients (e.g. De Moor et al., 2002).

Data Analysis

Because the study was under-powered, an exploratory approach to data analysis was taken. For example, an analysis of moderating variables could not be conducted, but the relationships between these variables and the outcome variables were explored. To minimize Type 1 error, total scores of the measures, rather than subscale scores, were generally used in analyses. However, consistent with other expressive writing studies (e.g. Stanton et al., 2002; De Moor et al., 2002), for the POMS analyses, an overall

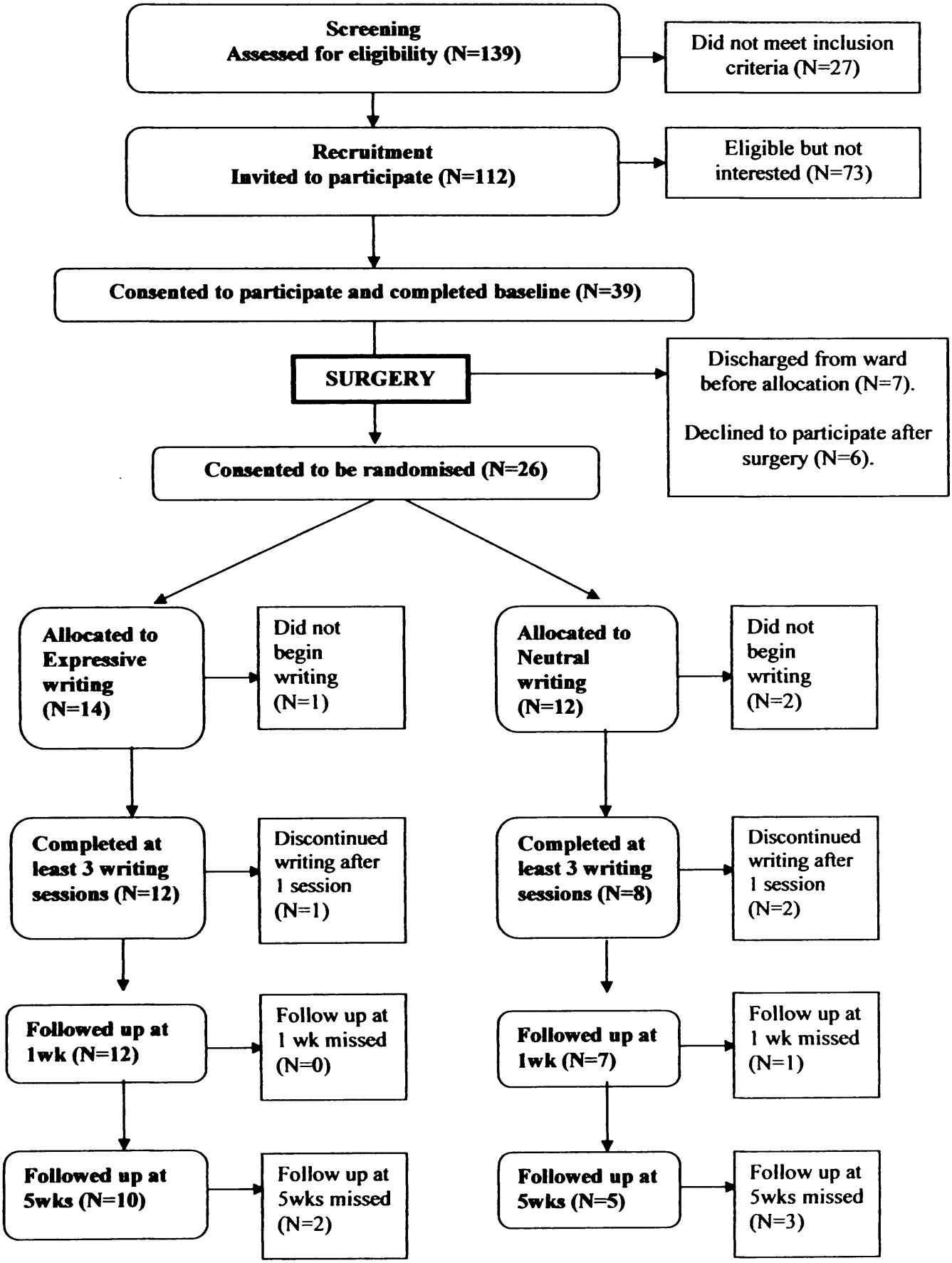
distress index (calculated by summing items on the anger, depression, tension, fatigue and confusion subscales) and the vigour subscale were used.

Results

Participant Flow

Figure 1 outlines the flow of participants through the study. A total of 112 patients met the eligibility criteria and were invited to participate in the study. Of these, 39 (35%) consented and completed the baseline questionnaires. A lack of interest in completing a writing task on the ward while recovering from surgery was the most frequently cited reason for declining. Of the 39 patients who completed baseline questionnaires, 13 dropped out of the study before randomisation. This was for a variety of reasons: being discharged from hospital before allocation, no longer wishing to participate following surgery or not being physically well enough to do the writing task. Of the 26 patients randomised to the writing tasks, 20 completed three or more writing sessions. Three completed one writing session only and three did not begin writing (intervention group: n=2; control group: n=4). Two women did not complete the writing task for reasons related to their assigned writing condition: one did not want to do the expressive writing task and the other completed one neutral writing session and then actively withdrew describing the task as "pointless". The main reason the four other women did not complete the writing was that they did not feel well enough to do so. Consequently, 20 (51%) of all patients who completed baseline questionnaires went on to complete three or more writing sessions and of those 19 completed one-week follow-up measures and 15 completed five-week follow-up measures.

Figure 1. Flow of participants through the study.



Sample Characteristics

The 39 patients who completed baseline questionnaires had a mean age of 52.9 years (SD=15.12) and the majority were White British (79.5%). Types of cancer included ovarian (48.7%), endometrial (10.3%), vulval (7.7%), cervical (7.7%) and other (10.3%). Three patients (7.7%) had suspected cancer prior to surgery and were diagnosed as having a benign condition following surgery; these patients were not excluded from the sample due to the study's recruitment difficulties and small sample size. Diagnostic information was not available for three patients (7.7%). Thirteen patients (33.3%) had laparoscopic surgery and 18 (46.2%) had non-laparoscopic surgery; the type of surgery was not known for 8 (20.5%) patients.

Table 1 compares the characteristics of 'baseline only' participants (i.e. those who dropped out of the study or who completed less than three writing sessions) and 'writing' participants (i.e. those who completed at least three writing sessions). There were no significant between group differences on demographic and medical variables, or on psychological and physical symptoms.

Of the 20 writing participants, 8 (40%) had chemotherapy and 1 (5%) had radiotherapy during the five-week follow-up period. One expressive writing participant was taking anti-depressants during the course of the study and one neutral writing participant was taking medication for sleep difficulties.

Table 2 compares the characteristics of participants in the expressive writing and neutral writing conditions. There were no significant differences between the groups on demographic and medical variables, or on physical and psychological symptoms. However, participants assigned to the neutral writing condition showed a trend ($p=0.079$) towards higher distress scores. Baseline distress scores for both writing

Table 1. Characteristics of all participants who completed baseline measures

	Baseline Only N=19	Writing N=20	Statistic	p
Age (years)	Mean=55.74 (SD=15.67)	Mean=50.20 (SD=14.45)	t(37)=-1.148	0.258
Ethnicity				
White British	N=14 (73.7%)	N=17 (85%)	$\chi 2$ (1)=0.329	0.566
Other	N=4 (21.1%)	N=3 (15%)		
Education				
Up to and incl A-level	N=12 (63.2%)	N=10 (50%)	$\chi 2$ (1)=0.755	0.385
Post A-level	N=6 (31.6%)	N=9 (45%)		
Diagnoses				
Ovarian	N=8 (42.1%)	N=11 (55%)		
Endometrial	N=2 (10.5%)	N=2 (10%)		
Vulval	N=1 (53%)	N=2 (10%)		
Cervical	N=2 (10.5%)	N=1 (5%)		
Benign	N=2 (10.5%)	N=1 (5%)		
Other	N=1 (5.3%)	N=3 (15%)		
Surgery				
Non-laparoscopic	N=6 (31.6%)	N=12 (60%)	$\chi 2$ (1)=2.425	0.119
Laparoscopic	N=8 (42.1%)	N=5 (25%)		
POMS[a]				
Distress	Mean=46.32 (SD=34.11)	Mean=64.55 (SD=38.66)	t(37)=1.559	0.128
			t(37)=-0.138	0.891
Vigour	Mean=12.89 (SD=6.73)	Mean=12.61 (SD=5.96)		
PSQI[b]				
Sleep Quality (month)	Mean=1.74 (SD=0.87)	Mean=1.37 (SD=0.60)	t(36)=-1.520	0.137
			t(37)=-0.071	0.944
Sleep Quality (night)	Mean=1.42 (SD=1.02)	Mean=1.40 (SD=0.82)		
CECS[c]				
Total score	Mean=47.32 (SD=12.97)	Mean=47.94 (SD=11.39)	t(37)=0.160	0.873
SCS[d]				
Total score	Mean=17.26 (SD=4.93)	Mean=16.45 (SD=5.35)	t(37)=-0.493	0.625

Due to missing data, Ns vary and percentages do not always sum to 100.
[a]POMS=Profile of Mood States, distress range 0-200, vigour range 0-32, higher scores indicate greater distress/vigour
[b]PSQI=Pittsburgh Sleep Quality Index, sleep quality range 0-3, higher scores indicate poorer quality
[c]CECS=Courtauld Emotional Control Scale, total score range 21-84, higher scores indicate greater emotional control
[d]SCS=Social Constraint Scale, total score range 0-32, higher scores indicate higher social constraints

Table 2. Characteristics of writing participants

	Expressive Writing N=12	Neutral Writing N=8	Statistic	p
Age (years)	Mean = 50.25 (SD=15.20)	Mean = 50.13 (SD =14.28)	t(18)=0.018	0.985
Ethnicity				
White British	N=9 (75%)	N=8 (100%)	$\chi 2$ (1)=2.353	0.125
Other	N=3 (25%)	N=0		
Education				
Up to and incl A-level	N=7 (58.3%)	N=3 (42.9%)	$\chi 2$ (1)=0.425	0.515
Post A-level	N=5 (41.7%)	N=4 (57.1%)		
Diagnoses				
Ovarian	N=5 (41.7%)	N=6 (75%)		
Endometrial	N=1 (8.3%)	N=1 (12.5%)		
Vulval	N=2 (16.7%)			
Cervical	N=1 (8.3%)			
Benign	N=1 (8.3%)			
Other	N=2 (16.7%)	N=1 (12.5%)		
Surgery				
Non-laparoscopic	N=6 (50%)	N=6 (75%)	$\chi 2$ (1)=0.142	0.707
Laparoscopic	N=3 (25%)	N=2 (25%)		
POMS[a]				
Distress	Mean=52.17 (SD=35.13)	Mean=83.13 (SD=38.22)	t(18)=-1.865	0.079
Vigour	Mean=13.94 (SD=7.13)	Mean=10.63 (SD=2.97)	t(18)=1.236	0.232
PSQI[b]				
Sleep Quality (month)	Mean=1.55 (SD=0.52)	Mean=1.13 (SD=0.64)	t(17)=1.576	0.133
Sleep Quality (night)	Mean=1.42 (SD=0.793)	Mean=1.38 (SD=0.916)	t(18)=0.108, p=0.915	
CECS[c]				
Total score	Mean=48.82 (SD=11.61)	Mean=46.63 (SD=11.71)	t(18)=0.413	0.685
SCS[d]				
Total score	Mean=15.42 (SD=5.25)	Mean=18.00 (SD=5.45)	t(18)=-1.062	0.302

Due to missing data, Ns vary and percentages do not always sum to 100.

[a]POMS=Profile of Mood States, distress range 0-200, vigour range 0-32, higher scores indicate greater distress/vigour

[b]PSQI=Pittsburgh Sleep Quality Index, sleep quality range 0-3, higher scores indicate poorer quality

[c]CECS=Courtauld Emotional Control Scale, total score range 21-84, higher scores indicate greater emotional control

[d]SCS=Social Constraint Scale, total score range 0-32, higher scores indicate higher social constraints

groups were considerably higher than those found in an expressive writing study with breast cancer patients (Stanton et al., 2002). It is possible that this was related to the fact that participants in the present study were facing major surgery the next day, rather than having completed medical treatment.

Manipulation Check

There were significant differences in participants' ratings of how much they revealed their emotions in their writing and how personal it was (Table 3). This indicated that participants in each condition adhered to the writing instructions they were given.

Table 3. Manipulation Check

	Expressive Writing N=12 Mean (SD)	Neutral Writing N=8 Mean (SD)	t(18)	p
'Emotional'	5.77 (0.96)	2.49 (1.14)	6.950	0.000
'Personal'	6.02 (0.84)	3.13 (1.40)	5.807	0.000

Analysis of Health Outcomes

The aim of the study was to examine the impact of expressive writing on the physical and psychological symptoms of sleep, pain and mood. Pain was only measured after surgery, whereas other health outcomes were measured at baseline and one-week follow-up. Five-week follow-up data was not analysed for two reasons. First, it was only obtained for 15 participants. Second, nearly half of participants received adjuvant treatment, such as chemotherapy or radiotherapy, during this follow-up period which

would have made the results difficult to interpret. Appropriate analyses to investigate change in health outcomes over time and any interaction effects would have been 2x2 ANOVAs, with writing condition being the between-subjects factor and time the within-subjects factor. However, this was not possible due to the small sample size; therefore change in each group was investigated using t-tests.

The ratings of the four pain severity questions on the BPI were highly inter-correlated (alpha coefficient=0.84) and therefore the composite score, i.e. the mean of these four items, was used in analyses. This is consistent with another expressive writing study with cancer patients (Rosenberg et al., 2002). The sleep quality component of the PSQI, based on one item in which participants rated their overall sleep quality, was used as the measure of sleep for two reasons. First, the item was included on both versions of the questionnaire and therefore allowed direct comparison between previous month's and previous night's sleep. Second, there was missing data on several of the other components, which made it impossible to calculate global PSQI scores for all participants.

Relationships among study variables

Pearson correlation coefficients were computed to examine relationships between participant age and baseline measures of mood, sleep, emotional control and social constraints (see Table 4.) As expected, the two POMS scores, distress and vigour, were negatively correlated and the two sleep quality scores, for the previous month and previous night, were positively correlated. Perhaps unsurprisingly, distress was positively correlated with previous night's sleep quality (higher scores indicating poorer quality); that is, more distressed women tended to report poorer sleep. Age was

negatively correlated with both distress and previous night's sleep quality; that is, older women tended to report lower distress and better sleep quality.

Pearson correlation coefficients were also computed to examine relationships between emotional control, social constraints and health outcomes at one-week follow-up (see Table 5). No significant correlations were found, although there was a non-significant trend for a positive association between POMS distress and social constraints ($r=0.442$, $p=0.066$); that is, women who reported higher levels of social constraints were more distressed.

Physical and psychological symptoms at one-week follow-up

Sleep, distress and vigour will be examined first as they were the variables measured at baseline and one-week follow-up, followed by pain, which was only measured at one-week follow-up. Table 6 compares sleep, distress and vigour at both time points for expressive and neutral writing participants.

There was a significant improvement in previous night's sleep quality between baseline and one-week follow-up in both the expressive writing condition and the neutral writing condition. That is, all participants, regardless of writing condition, reported improved sleep. There were no significant changes in distress over time. However, there was a trend towards significance ($p=0.061$) on vigour scores in the expressive writing group; that is, contrary to prediction, vigour scores decreased between baseline and one-week follow-up.

At one-week follow-up, the mean pain severity score for expressive writing participants was 2.02 (SD=2.00) and for neutral writing participants was 1.36 (SD=1.31). This was not a significant difference between the groups ($t(17)=0.779$, $p=0.447$).

Table 4. Correlations between age of participants and baseline measures of mood, sleep, emotional control and social constraints.

	2	3	4	5	6	7
1. Age	-0.380*	0.289	-0.148	-0.355*	0.066	-0.027
2. POMS[a] (distress)		-0.405*	0.221	0.348*	0.207	0.105
3. POMS[a] (vigour)			-0.019	-0.143	0.105	-0.152
4. PSQI[b] (month quality)				0.586**	0.006	0.282
5. PSQI[b] (night quality)					0.028	0.122
6. CECS[c]						0.154
7. SCS[d]						

Due to missing data, N ranges from 38 to 39.
* Correlation is significant at the 0.05 level (2 tailed) ** Correlation is significant at the 0.01 level (2 tailed)
[a]POMS=Profile of Mood States, higher scores indicate greater distress/vigour
[b]PSQI=Pittsburgh Sleep Quality Index, higher scores indicate poorer quality
[c]CECS=Courtauld Emotional Control Scale, higher scores indicate greater emotional control
[d]SCS=Social Constraint Scale, higher scores indicate higher social constraints

Table 5. Correlations between emotional control, social constraints and health outcomes at 1 week follow-up.

	2	3	4	5	6
1. CECS[a]	0.180	0.097	0.249	-0.207	-0.036
2. SCS[b]		0.442	-0.295	0.130	0.153
3. POMS[c] (distress)			-0.320	0.096	0.130
4. POMS[c] (vigour)				-0.229	0.128
5. PSQI[d] (night quality)					0.125
6. BPI[e]					

Due to missing data, N ranges from 18 to 20.
[a]CECS=Courtauld Emotional Control Scale, higher scores indicate greater emotional control
[b]SCS=Social Constraint Scale, higher scores indicate higher social constraints
[c]POMS=Profile of Mood States, higher scores indicate greater distress/vigour
[d]PSQI=Pittsburgh Sleep Quality Index, higher scores indicate poorer quality
[e]BPI=Brief Pain Inventory, higher scores indicate greater pain severity

Table 6. Health outcomes in expressive writing (EW) and neutral writing (NW) participants at baseline and 1 week follow-up.

	Baseline Mean (SD)	1 week follow-up Mean (SD)	Statistic	p
PSQI[a] (night quality)				
EW	1.42 (0.79)	0.75 (0.45)	t(11)=2.602	0.025*
NW	1.29 (0.95)	0.57 (0.54)	t(6)=2.500	0.047*
POMS[b] (distress)				
EW	54.27 (36.04)	46.90 (29.59)	t(10)=1.239	0.244
NW	82.43 (41.22)	65.00 (19.53)	t(6)=1.659	0.148
POMS[b] (vigour)				
EW	14.03 (7.47)	11.36 (8.82)	t(10)=2.112	0.061
NW	10.14 (2.85)	10.29 (3.20)	t(6)=-0.130	0.901

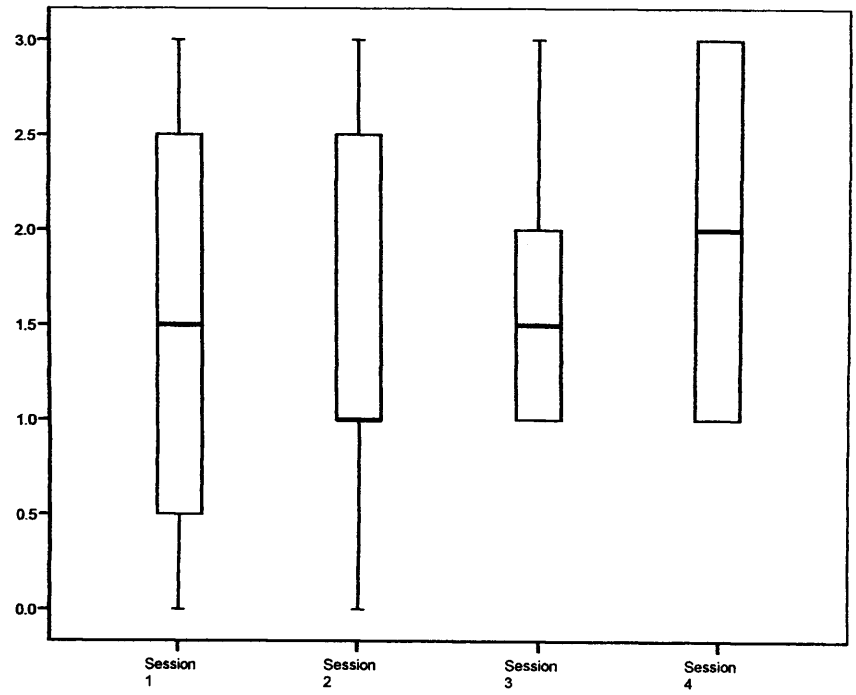
Due to missing data, N ranges from 11 to 12 for the expressive writing condition and from 7 to 8 for the neutral writing condition.
[a]PSQI=Pittsburgh Sleep Quality Index, sleep quality range 0-3, higher scores indicate poorer quality
[b]POMS=Profile of Mood States, distress range 0-200, vigour range 0-32, higher scores indicate greater distress/vigour

Changes in sleep and pain during course of writing sessions

As part of the exploratory focus of this study, daily self-report ratings of pain and sleep were explored to investigate whether there were any changes during the course of the writing sessions.

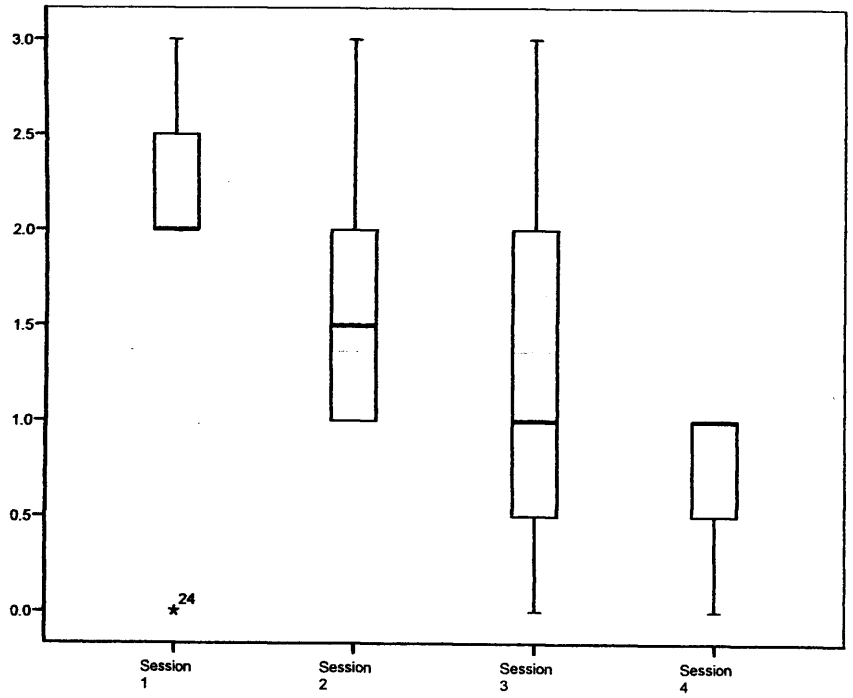
Figures 2 and 3 show the previous night's sleep quality across writing sessions for expressive writing and neutral writing participants. Expressive writing participants' scores varied considerably and there was no clear pattern of change. Neutral writing participants' scores showed a trend towards improved sleep quality over subsequent writing sessions, although they tended to report poorer sleep quality at the first session than expressive writing participants.

Figure 2. Sleep quality (night) across writing sessions in expressive writing participants.



N=12 for sessions 1-3, N=6 for session 4

Figure 3. Sleep quality (night) across writing sessions in neutral writing participants.



N=8 for sessions 1-3, N=3 for session 4

Key (sleep quality): 0= good, 3= poor.

Figures 4 and 5 show pain severity scores across writing sessions for expressive writing and neutral writing participants. No patterns emerged for either group of participants.

Discussion

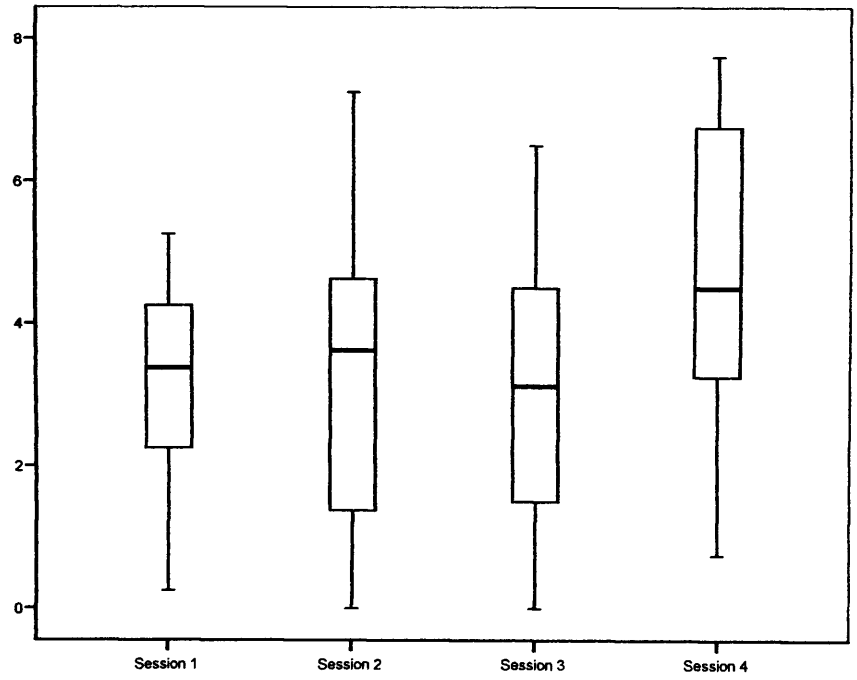
This study explored the feasibility and outcomes of expressive writing as a psychological intervention for women recovering from gynaecological surgery. No effects were found on outcome measures of sleep, pain and mood. However, the study's low statistical power made it difficult to draw firm conclusions about the effectiveness of expressive writing in this medical population.

Feasibility and acceptability of the intervention

Approximately two-thirds of patients who met eligibility criteria were not interested in taking part in the study. These figures are higher than other expressive writing studies with cancer patients (e.g. De Moor et al., 2002; Stanton et al., 2002) which is likely to be due to the particular challenges of the setting and the patients' point on the disease trajectory. For instance, recruitment took place on a busy medical ward and was hindered by the lack of a quiet, private room in which to discuss the study with patients. The women were approached on the day of their hospital admission, when they would have been understandably anxious about their impending surgery (Brennan, 2004). This probably made them less willing to read the Information Sheet, consent to the writing intervention and complete baseline questionnaires. There were also women whose lack of interest was particularly due to not wanting to do a writing intervention.

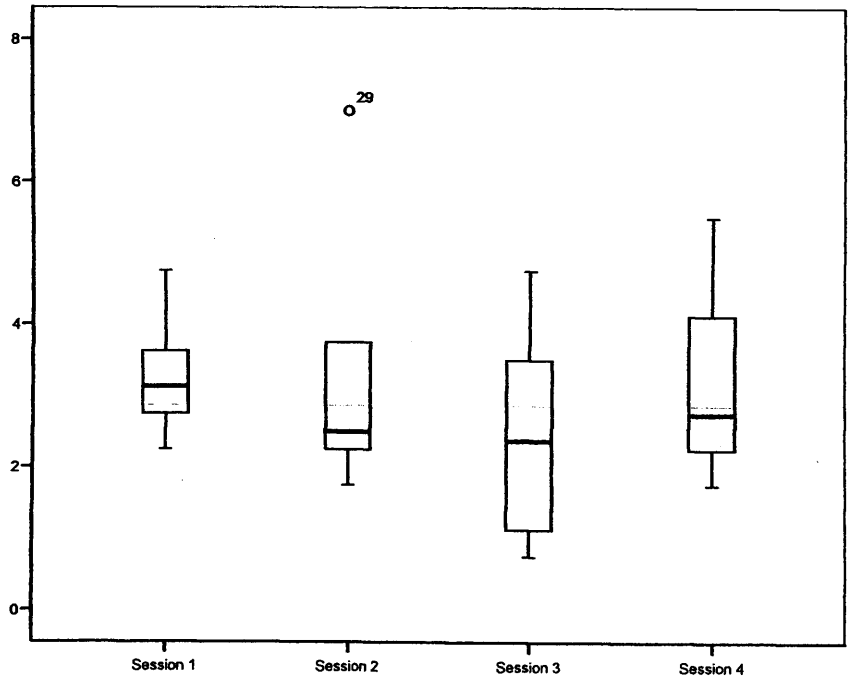
Two-thirds of the patients who consented to take part in the study and completed baseline questionnaires reached the randomisation stage. The most common reasons

Figure 4. Pain severity across writing sessions in expressive writing participants.



N=12 for sessions 1-3, N=6 for session 4

Figure 5. Pain severity across writing sessions in neutral writing participants.



N=8 for sessions 1-3, N=3 for session 4

Key (pain severity): 0= no pain, 8= bad pain.

why patients did not reach the randomisation stage after consenting were that they were discharged from hospital beforehand or were physically too unwell to do the writing task. Just under one quarter of those randomised to a writing condition did not complete three or more writing sessions. Once again, the most frequent reason that precluded them from doing so was their poor physical condition, rather than them actively withdrawing from the study.

The intervention seemed to be well accepted by those who commenced the writing tasks. The attrition rate was very low, with 87% completing three or more writing sessions. Only two participants ceased writing because they were unhappy with the writing condition to which they had been assigned (one was in the neutral writing condition and one was in the expressive writing condition). The expressive writing participants adhered to the writing instructions as their manipulation check ratings indicated that their writing contained high levels of emotional and personal content. This suggests that, despite the challenges of the setting, it is possible to complete an expressive writing task whilst lying in a hospital bed recovering from major surgery. The neutral writing participants revealed significantly less emotion in their writing as hoped. Their writing was not entirely devoid of emotion, which would probably have been impossible given their circumstances, but the significantly lower ratings suggest that writing a factual account of life on the ward has feasibility as a neutral writing task. After follow-up data had been received, approximately half of participants were informally interviewed by a researcher on the telephone and gave their feedback about participating in the study. The majority, particularly those in the expressive writing condition, were positive about the writing intervention whilst also acknowledging that it sometimes caused them some distress. For instance, one woman said "Although at times

the writing made me upset, it was a chance to release things rather than bottle them up". Another summed up her experience by saying "It was good to have time and space with curtains closed to think about what was going on for me. It [expressive writing] allowed me time to think and cry as up until that point I'd been so focussed on worrying about how my family was going to cope with me in hospital." These comments suggest that for some women expressive writing was a positive experience and support its acceptability as an intervention, but they do not allow us to draw conclusions about its benefits on physical and psychological symptoms.

Sleep, Pain and Mood

Previous night's sleep quality improved between baseline and one-week follow-up for all writing participants. It is unlikely that environmental factors explain these results since the majority of participants spent both the night prior to baseline and the night prior to the one-week follow-up in their own home. However, it is likely that sleep quality during the night prior to baseline was negatively impacted by the fact that women were being admitted to hospital the next day for major surgery. This hypothesis is supported by the finding that, on average, distress levels were higher at baseline than at one-week follow-up and distress was positively correlated with poorer sleep quality at baseline. It is also possible that this improvement in sleep quality was a result of tiredness caused by having had surgery.

There were no significant changes in distress over time for either of the two groups of participants. However, there was a non-significant trend of deterioration in vigour for expressive writing participants. This is contrary to expectations since another expressive writing study with cancer patients found that vigour improved (De Moor et al., 2002). This reduction in vigour could be the result of the impact of surgery,

although the trend was not found in neutral writing participants. Alternatively, it is possible that it is explained by regression to the mean, as expressive writing participants had higher levels of vigour at baseline compared to neutral writing participants. It is also important to note the limitations of using vigour as a measure in post-operative patients, since the impact of surgery and subsequent course of recovery will clearly affect self-report ratings on items such as 'lively'.

At one-week follow-up, there was no difference in self-reported pain severity between expressive and neutral writing participants. Apart from a trend towards improved sleep quality for neutral writing participants, there were no clear patterns of daily change in pain and sleep ratings during the course of the writing sessions. This is perhaps not surprising given that previous research does not suggest expressive writing would have such an immediate effect. Other studies have generally focussed on investigating the longer term impact of expressive writing with follow-up periods ranging from one week to 10 months following completion of the intervention.

A significant association between participant age and distress at baseline was found which indicated that younger women tended to be more distressed. This is probably to be expected given that common sequelae of gynaecological surgery, such as impaired or lost fertility (Auchincloss, 1995), are more likely to have a negative psychological impact on women at an earlier life stage. There was also a trend for a positive association between distress at one-week follow-up and level of social constraints, that is "the perceived inadequacy of social support resulting in reluctance among individuals to express thoughts and feelings about a specific stressor" (Zakowski et al., 2004, p.556). Although, this must be interpreted with caution it is consistent with previous research which has found higher scores on social constraints correlated with

higher levels of cancer-specific distress and general distress symptoms (Lepore and Revenson, 2007).

Limitations of the study

In addition to its low statistical power, this study has several limitations in relation to the sample and design.

The small sample size made it impossible to carry out appropriate analyses to assess health outcome change and to investigate moderating variables which had been one of the original aims. The sample was also very heterogeneous. Participants varied in terms of the type of cancer, surgical procedure, medication and treatment received during their hospital stay, and pre-existing physical health problems. This introduced confounding variables that were likely to have had a powerful impact on the health outcomes measured. For instance, a patient's analgesic medication would have affected their self-report ratings of pain. A patient's post-operative course, and the news they received regarding the success of the operation and their prognosis, would have understandably affected their mood. The sample also included three patients who were informed that they did not have cancer during the follow-up period which is likely to have also had an impact on outcome measures.

Another limitation that may explain the lack of findings relates to the length of follow-up. It was not possible to analyse five-week follow-up data because nearly half of the writing participants had either chemotherapy or radiotherapy during this period. The fact that patients were receiving adjuvant treatment following surgery made it less likely that they were able to complete and return their questionnaires. However, even if they were able to, the treatment unfortunately would have confounded the health outcomes. It is therefore possible that benefits of expressive writing were undetected in

this study as previous studies (e.g. Stanton et al., 2002) have found health benefits only emerged at later follow-up points.

Challenges and future directions

There are particular challenges involved in conducting expressive writing on a medical ward and adhering to Pennebaker and Beall's (1986) paradigm. This could potentially be another explanation for the lack of findings. For instance, it was not possible for the writing sessions in this study to take place in a private room and this factor has been found to moderate health outcomes (Frattaroli, 2006). In an attempt to address this, patients had the curtain drawn around their bed to increase a sense of privacy, with a sign attached explaining that a writing session was in progress. However, there were sometimes unavoidable interruptions due to medical activities on the ward, which consequently prevented participants being able to write continuously for 20 minutes.

This study's findings raise some doubt about the feasibility of introducing expressive writing as an intervention at such an acute stage of illness. A focus of future studies should therefore be to identify possibly ways of increasing study participation and reducing attrition. One way of doing this would be to allow participants to carry out some or all of the writing sessions at home after their hospital discharge. Other expressive writing studies (Broderick, Stone, Smyth & Kaell, 2004; Wetherell et al., 2005) have demonstrated its feasibility as a home-based intervention, as long as there are sufficient strategies to ensure adherence to the research protocol and to monitor writing-induced signs of distress. Another means of reducing attrition would be to conduct writing sessions prior to surgery (Solano et al., 2003; Solano et al., 2007) when participants are more likely to be physically well enough to complete a writing task. A

further option would be to incorporate verbal disclosure into the protocol allowing participants to speak into a tape recorder, as other expressive writing studies have done (e.g. Kelley et al., 1997). This prevents attrition from participants who are deterred from taking part either because they do not enjoy writing or are physically unable to do so.

Expressive writing is a low-cost, easy-to-administer intervention and has huge potential as a therapeutic tool in medical populations. A potential advantage of using it early on in the disease trajectory is that this can be a particularly distressing time for patients. In addition, research from healthy populations indicates that larger effect sizes are found on psychological outcomes when participants write about current (as opposed to previous) traumas (Smyth, 1998). Disadvantages include recruitment problems and the possibility that subsequent treatment will confound follow-up data. Further studies, with large sample sizes and robust methodological designs that address these challenges, are needed to clarify whether expressive writing has health benefits for women recovering from major surgery for gynaecological cancer. If the findings are promising, it could be a useful means of addressing these patients' psychological needs and provide an adjunct to other aspects of their treatment.

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Part 3: Critical Appraisal

Introduction

This paper is a reflection on the process of conducting the research study. It will start with a brief outline of the challenges involved in setting up the study and then discuss issues related to recruitment of participants and implementation of the intervention. The paper will conclude with a reflection on the impact of the study on the medical team and on me as a researcher.

Setting up the Study

The way in which hospital wards operate is largely governed by unwritten rules that are taken for granted by the staff (Brennan, 2004). Since this study took place on a hospital ward, a key challenge in setting it up was learning these rules and understanding the medical system. This was facilitated by meetings with the ward sister, but the most vital part of the process was spending time on the ward itself and observing first-hand the way in which it worked. Implementation of the study involved an extensive logistical operation and during the planning phase recruitment, intervention and follow-up protocols were devised. These were an important way of ensuring consistency since it was a joint project and three researchers were involved in all aspects of the study. Several patients on the ward were consulted about the study and their feedback incorporated into the planning. Another challenge of this study was its reliance on numerous non-psychology professionals. Establishing links and good working relationships with the surgeons, ward sister, ward nurses and administrative staff was therefore another key aspect of set-up. This was facilitated by having the clinical psychologist in the medical team as part of the research group.

Issues in Recruitment

There were three main stages involved in the recruitment process which will be discussed in the chronological order in which they took place: implementing the eligibility criteria, logistical considerations and approaching potential participants. The stages all involved negotiation of the 'medical system', liaison with ward staff and clinical judgement.

Implementing the eligibility criteria

The first stage involved establishing whether the patients admitted to the ward each week met the study's eligibility criteria. The inclusion and exclusion criteria were clear in theory, but I soon discovered that implementing them was going to be complex in practice. Part of the challenge arose from needing to understand all the medical terminology contained in a patient's notes and knowing how what was written determined their eligibility. For instance, it was sometimes difficult to decipher whether a patient had already received a cancer diagnosis, what it was if they had and how long they were expected to stay on the ward following surgery. There was often limited access to medical staff on the ward to clarify these issues and assist with decision-making. However, as the study progressed and my medical knowledge increased I became more confident in assessing eligibility of patients independently.

During the course of the study the original inclusion and exclusion criteria were amended as a result of the low number of participants being recruited. The recruitment difficulties were partly related to there being a smaller target population (i.e. patients admitted to the ward for non-laparoscopic surgery for ovarian or endometrial cancer) than had originally been projected. This was caused by several factors including a consultant surgeon being on maternity leave during the course of the study and an

increasing number of patients having laparoscopic surgery which made them less likely to be able to complete the intervention due to a shorter hospital stay. The inclusion criteria were consequently broadened to include any type of gynaecological cancer and patients with other physical health problems were no longer excluded. However, despite these changes recruitment difficulties remained an ongoing issue throughout the study. This provoked continued discussion within the research team about whether inclusion criteria should be extended further, such as including patients from other wards who were undergoing other forms of gynaecological surgery. However, we felt that this would increase the heterogeneity of an already heterogeneous sample too much and covering two wards would create logistical problems, so we decided against doing this. There was also ongoing discussion about exclusion criteria. This was partly caused by the pressure to increase participant numbers and a desire not to discriminate against patients keen to do the writing while on the ward. For instance, at one point we decided against enforcing the criteria of needing to write fluently in English when a patient wanted to do the writing in her native African language in which she was more fluent. She subsequently decided against consenting, but this example highlights the eligibility issues that frequently arose.

Logistical considerations

Once a patient had been deemed eligible, there were three factors that had to be addressed before she could be approached by a researcher. The first involved establishing whether the patient was well enough to be approached, which was confirmed by the nursing staff on the ward. The second involved locating where the patient was, which involved liaison with the ward administrator. This was more challenging during periods when there was a shortage of beds on the ward, as patients

would consequently have a long wait between their hospital admission and their allocation to a bed. This understandably caused them frustration and distress which often appeared to reduce the likelihood that they would consent to the study. The third factor involved ascertaining when it was possible, and when was the best time, to approach the patient. On the day of hospital admission, each patient underwent a busy schedule of medical activities and procedures on the ward. It was therefore necessary to spend time 'hovering' on the ward, in order to be aware of the gaps in the schedule when a patient was free to be approached. Other considerations were also involved in deciding on the best time and judging when the patient might be most amenable to hearing about the study. These included knowing whether or not they had already been asked to take part in another research study on the ward and whether they were feeling physically uncomfortable due to pre-operative medical procedures.

Approaching potential participants

The third stage of recruitment involved one of the researchers approaching the patient, which usually took place at their bedside. As time was very limited, it was important to be able to succinctly explain the study. We found the best way of doing this was to describe it in terms of "keeping a diary", which is a familiar concept to most people. However, this may have introduced some bias into the sample as people who did not like writing diaries may have been immediately put off and been less likely to consent. The majority of patients did not immediately decline and were interested in reading the Information Sheet. They were given time to read this and decide whether they wanted to take part, before being re-approached by the researcher.

I was always acutely aware of several issues at this stage of recruitment. First, the patients' mental state, since people are understandably anxious before surgery and

can find hospital admission a daunting experience (Brennan, 2004). There was also evidence from conversations with some patients that they were in shock and denial about their reason for being in hospital. Second, I was aware of the power imbalance that often exists between a researcher and potential participant (Barker, Pistrang & Elliott, 2002). In this study, this imbalance was likely to have been exacerbated by the fact that potential participants were patients in the process of being subjected to pre-operative medical procedures and lying in a hospital bed. My awareness of these issues undoubtedly affected the way in which I interacted with patients. I aimed to be empathic, sensitive and careful not to do anything that could have been coercive in nature. In doing so, however, I may have been more tentative than necessary and may sometimes not have 'sold' the study very persuasively to potential participants.

On several occasions other medical professionals were also involved in this stage of recruitment. For instance, the ward sister was sometimes able to introduce the study to patients and leave the Information Sheet with them to read before they were approached by a researcher. The department clinical psychologist also mentioned the study to several patients during her contact with them prior to hospital admission. The advantage of this is that it gave the study overt endorsement from a member of the medical team, which may have made patients more likely to take part. However, there are several potential disadvantages. First, being encouraged to take part by a medical professional involved in a patient's care can cause the patient to fear that refusing will prejudice their treatment (Barker et al., 2002). Second, despite briefing them, there was concern that the other professionals may have described the study in such a way as to raise expectations that all participants would be assigned to do expressive writing rather than being randomised to one of two conditions.

As the study progressed, we noticed that younger women seemed to be more likely to consent to take part than older women who were approached. It was not possible to statistically analyse this possible difference as we did not collect data on those who declined. However, it is interesting to note that an expressive writing study conducted with rheumatoid arthritis patients found that people who agreed to participate were significantly younger than those who did not (Broderick, Stone, Smyth & Kaell, 2004). It is possible that our expectation that older women were more likely to decline affected the way in which we subsequently approached them at recruitment which perpetuated the trend and introduced bias into the sample.

On reflection, if it had been possible, it may have been advantageous to recruit participants when they were attending an outpatient appointment prior to their hospital admission. This could potentially have increased study participation for several reasons such as there being more time and privacy available to discuss the study with patients and them possibly being less anxious because they were not having major surgery the next day.

Issues in Implementing the Intervention

A number of issues arose in implementing the intervention; these concerned the commencement of writing sessions, assignment to writing condition and adherence to instructions, privacy and post-writing distress.

Commencement of writing sessions

Following clinical advice from the medical team and research suggesting that up to 72 hours after major gynaecological surgery patients have a deficit in sustained attention (Dale, Naik, Williams, Lloyd & Thompson, 2005), it was decided that patients would be approached on the third day after surgery regarding the commencement of

writing sessions. Some patients were approached on the second day if they had had laparoscopic surgery and were judged by the ward sister to have had a good post-operative recovery. After checking with the nursing staff that patients were well enough to be approached, the researcher discussed the study with them. Initially it was important to confirm with them that they were willing to continue participating in the study and then to ascertain whether they were well enough to sit up in bed and complete 20 minutes of writing. Once again, I was aware of the power imbalance between myself as a researcher and them as a participant and was careful not to pressurise them, in any implicit or explicit way, into starting writing sessions that day. I had met some of the participants before this stage if I had personally recruited them, whilst others had been recruited by another member of the research team. It often seemed easier to have a more collaborative discussion with a participant who I had met previously and with whom I had already established a rapport. If the participant was not well enough to start writing, but wanted to remain in the study, then it was generally agreed that they would be visited by a researcher the next day to review the situation with them then. I often experienced a dilemma when I found that a patient I needed to approach was asleep during the period I was on the ward. The nurses would always encourage me to wake the patient up which was consistent with their practice, as they are routinely required to do so when administering medical treatments at particular times. However, I felt there was a difference between waking up a patient for medical treatment and waking them up to discuss a research project. In light of the fact that these women were at such an acute stage of their illness and that sleep patterns are severely disrupted in post-operative patients (Kehlet, 1997), I took the personal decision not to awake participants for research purposes. This sometimes meant they were not approached until the next day.

Assignment to writing condition and adherence to instructions

Issues arose at randomisation when a participant had a particular preference for a writing condition and were then not randomised to it. This situation required sensitivity and acknowledgement of the participant's wishes, as well as an explanation about the nature of randomised controlled trials and the fact it was not possible to be reassigned to a different condition. Two participants (one allocated to neutral writing and the other to expressive writing) ended up withdrawing from the study as a result of this.

All participants assigned to the expressive writing condition were informed that this type of writing task might cause them some short-term distress (Smyth, 1998). I often felt slightly uncomfortable about instructing a seriously ill patient to do a task that could cause them distress, particularly since the role of a clinical psychologist is to relieve, rather than induce psychological distress, and we were unsure whether the intervention would benefit the participants in any way. I also felt challenged on a couple of occasions when the manipulation check monitoring revealed that a participant was not adhering to the writing instructions that they had been given. For instance, one neutral writing participant rated that she had revealed a high level of emotion in her first writing session and explained that she found it difficult not to do so, given the highly emotional situation that she was currently in. I gently encouraged her to follow the instructions as much as she could, but it felt unethical to be any more forceful than this. Her manipulation check ratings reduced on subsequent writing sessions and she was therefore still included in the neutral writing group.

Privacy

It was impossible for participants to have total privacy during the writing sessions since their physical condition precluded them from leaving their hospital bed on

the ward. A sense of privacy was increased by drawing the curtains around their bed and attaching a sign which explained that a writing session was in progress. However, the writing sessions were sometimes unavoidably interrupted by medical examinations or treatment which meant that the degree of privacy varied between participants and from session to session.

Post-writing distress

Participants were sometimes tearful and upset after an expressive writing session and some of them wanted to talk about the emotions that had been evoked by the writing. A research protocol had been established to ensure that they were provided with the appropriate support that they needed. However, implementing this raised several issues and required much clinical judgement. For instance, it was important to provide participants with the opportunity to talk about their emotions and yet, as a trainee clinical psychologist, it was challenging to do this without going into 'therapy' mode. I was aware, that providing a mini-'therapy' session after an expressive writing session could confound the results of the study and one of the ways I avoided doing this was by limiting the number of open-ended questions I asked. This illustrates the tension that sometimes existed between meeting the immediate needs of the patient and the methodological needs of the research study. The other issue raised by this relates to confidentiality. Although, having the curtains drawn around the participant's bed gave some sense of privacy, it was important to be aware that everything she said could potentially be heard by other patients and medical staff in the same bay. The only practical way that I could think of managing this was to lower the volume of my own voice during these conversations, which was often followed by the participant lowering

her own voice. This adjustment hopefully reduced the likelihood of the content being overheard.

Several features of ward life impacted on all aspects of the intervention including the participant's medical treatment, meal times and visitors. It was therefore important to adopt a flexible, diplomatic approach and to be prepared for interruptions whilst implementing the intervention.

Impact of the Study

It is possible that investigating this psychological intervention on a hospital ward had an impact on the medical team that work there. The importance of addressing the psychosocial needs of cancer patients is well-recognised (NICE, 2004) and yet the medical model still prevails on hospital wards which can result in a patient's psychological needs sometimes being overlooked. This study had a visual presence on the ward through the posters that were displayed and the sign that was attached to patient's curtains when a writing session was in progress. I also had numerous conversations with nursing staff about the study during my time spent on the ward. The study may therefore have indirectly raised awareness about the importance of addressing patients' psychological needs in the post-operative period and the possibility of introducing new interventions during their recovery on the ward.

This study certainly had an emotional impact on me. I spent many hours on the ward being exposed to critically ill patients and sometimes overhearing doctors delivering 'bad news' to them. I was also required to read medical files which often contained information about a patient's prognosis, which was sometimes terminal. This was particularly challenging when I subsequently had direct personal contact with the patient or when the patient in question was of a similar age to me. One of the many

advantages of this being a joint project was the availability of peer support to manage these emotional issues.

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Appendix 1: Trainee Contributions

Trainee Contributions to the Joint Project

All three researchers (Rebecca Delmar-Morgan, Henrietta Saunders and Lois Thomas) were responsible for project planning and set-up, recruitment of participants, implementation of the intervention, obtaining nurse ratings and making telephone calls about the follow-up questionnaires. A weekly rota was compiled to timetable responsibilities between the researchers and this influenced the distribution of some of the tasks. For instance, in the latter half of the project Henrietta Saunders and Rebecca Delmar-Morgan covered the days on which participant recruitment took place and Lois Thomas covered the day on which the surgery list was reviewed.

Henrietta Saunders and Rebecca Delmar-Morgan were responsible for setting up the SPSS database, coding questionnaires and data entry. Lois Thomas designed the posters and leaflets. She also analysed the recruitment and attrition data which was included in Figure 1. Henrietta Saunders liaised with the clinical nurse specialists regarding the distribution of leaflets and liaised with the surgeons regarding the design of the post-operative healing rating. Rebecca Delmar-Morgan collected pain medication data from clinical charts and attended outpatient clinics to obtain the surgeon ratings.

Appendix 2: Ethics Approval Letter

Camden & Islington Community Local Research Ethics Committee
Room 3/14
Third Floor, West Wing
St Pancras Hospital
4 St Pancras Way
London
NW1 0PE

02 May 2007

Dr Nancy Pistrang
Senior Lecturer in Clinical Psychology
Sub-Department of Clinical Health Psychology
University College London
Gower Street
London
WC1E 6BT

Dear Dr Pistrang

Full title of study: **Expressive writing and recovery from surgery for ovarian and endometrial cancer: A hospital diary study**

REC reference number: **07/Q0511/17**

The REC gave a favourable ethical opinion to this study on 26 March 2007.

Further notification has been received from local site assessor following site-specific assessment. On behalf of the Committee, I am pleased to confirm the extension of the favourable opinion to the new site. I attach an updated version of the site approval form, listing all sites with a favourable ethical opinion to conduct the research.

R&D approval

The Chief Investigator or sponsor should inform the local Principal Investigator at each site of the favourable opinion by sending a copy of this letter and the attached form. The research should not commence at any NHS site until approval from the R&D office for the relevant NHS care organisation has been confirmed.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

07/Q0511/17	Please quote this number on all correspondence

Yours sincerely

Enclosure: *Site approval form*

Copy to: *Sponsor and Research Governance contact:*

Mr Philip Diamond
Research & Development Directorate
University College London Hospitals NHS Foundation Trust
1st Floor, Maple House
c/o Postroom, Rosenheim Wing
25 Grafton Way
London
WC1E 5DB

Appendix 3: Participant Information Sheet

University College London Hospitals NHS
NHS Foundation Trust

UCLH Gynaecological Cancer Centre
Elizabeth Garrett Anderson Hospital
Huntley Street
LONDON WC1E 6DH

Version: 2
Date: 07.11.07
REC reference number: 07/Q0511/17

Hospital Diary Study

Patient Information Sheet

We are inviting you to take part in a research study looking at whether writing a daily diary while in hospital can help with recovery after surgery. Before you decide whether to take part it is important for you to understand why the research is being done and what it will involve.

Part 1 of this information sheet tells you the purpose of this study and what you will have to do if you take part. **Part 2** gives you more detailed information about the conduct of the study.

Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Part 1 of the information sheet

What is the purpose of the study?

Research has found that a daily writing task – similar to keeping a diary – may be helpful for people with medical conditions such as breast cancer, asthma and rheumatoid arthritis. However, little is known about whether writing might be useful just after surgery. This study aims to find out whether and how keeping a brief diary for 4 days might benefit women who are recovering from surgery for gynaecological cancer.

Why have I been chosen?

We are inviting all women undergoing major surgery at UCLH for gynaecological cancer to participate. Approximately 60 women will be taking part in the study.

Do I have to take part?

It is up to you to decide. If you do decide to take part you will be asked to sign a consent form and you will be given this information sheet and the signed consent form to keep. If you decide to take part you are still free to withdraw at any time and without giving a reason either to the researchers or other staff. A decision not to take part or a decision to withdraw will not affect the standard of care you receive.

What will I have to do?

If you agree to take part, you will be asked to write for 20 minutes on four days while you are in hospital, starting on the third day after surgery. To find out about whether writing is helpful, we will be comparing two different ways of keeping a diary. You will be asked to either:

(1) write about your feelings and thoughts about your surgery and illness

or

(2) write about daily activities on the ward.

Which type of diary you are asked to keep will be decided by chance (randomly). You will have an equal chance of doing either one.

To make sure that your diary is anonymous, it will be identified by a code number only and it will be put in a sealed envelope each day. It will then be transcribed into electronic form, with any identifying information removed, and the hand-written sheets will be destroyed.

We will also ask you to complete some questionnaires on the day before surgery (when you are on the hospital ward) and then one week and six weeks after finishing the diary (when you are at home). These questionnaires ask about a range of things, including how you are sleeping, the amount of pain you are in, your mood, and your feelings about yourself and others. They should take about 40 minutes to complete. In addition, on each day you do the diary, we will ask you to complete some brief questionnaires, taking about 5 minutes. A member of the research team will also look in your medical records so that we can obtain some details of your medical care.

Expenses

There will be no expenses involved in taking part. We will provide you with pre-paid envelopes for sending us the questionnaires that you complete at home.

What are the possible disadvantages or risks of taking part?

Sometimes people feel upset or distressed immediately after writing in a diary, especially if they are writing about personal thoughts and feelings. Previous studies have found that such distress does not last long – it usually goes away within an hour or so after writing. Should you feel at all upset after any of the writing sessions, a member of the project team will be available to talk to you and will make sure that you are given support if it is needed. You will also be free to stop participating in the study if you wish to.

What are the possible benefits of taking part?

We hope that you will find participating in this study interesting, but we cannot promise that you will benefit directly from it. The findings of the study should be of benefit to future patients. By learning about the ways in which keeping a diary might be helpful, we hope to improve the treatment of women recovering from surgery for gynaecological cancer.

What happens when the research study stops?

At the end of your participation in the study (6 weeks after keeping the diary), we will give you more information about it if you are interested. We will also send you a summary of our findings when the study is completed.

What if there is a problem?

Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. The detailed information on this is given in Part 2.

Will my taking part in the study be kept confidential?

Yes. We will follow ethical and legal practice and all information about you will be handled in confidence. The details are included in Part 2.

This completes Part 1 of the information sheet. If the information in Part 1 has interested you and you are considering taking part, please read the additional information in Part 2 before making any decision.

Part 2 of the information sheet

What will happen if I don't want to carry on with the study?

You are free to withdraw from the study at any time without giving any reason. If you withdraw from the study, we will use the data collected up to your withdrawal, unless you ask us to destroy it. If you decide not to carry on with keeping the 4-day diary, we will ask if you would still be willing to complete the questionnaires.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions (see contact details below). If you remain unhappy and wish to complain formally, you can do this through the NHS Complaints Procedure. Details can be obtained from the hospital.

If you are harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for a legal action but you may have to pay for it. Regardless of this, if you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of the study, the normal National Health Service complaints mechanisms should be available to you.

Will my taking part in this study be kept confidential?

All information which is collected about you during the course of the research will be kept confidential. A code number, rather than your name, will be used to label all data, so that you cannot be identified. Transcriptions of the anonymous diaries will be made, with any identifying information removed, and then the hand-written scripts will be destroyed. Dr Nancy Pistrang will be responsible for the safety and security of all data, which will be stored at UCL. Only the research team will have access to the data. Participants have the right to check the accuracy of data held about them and correct any errors.

Your consultant at UCLH will be informed that you are taking part in the study, and a copy of the signed consent form will be put in your medical notes. The specific information you provide will not be passed on to the consultant without your permission. The only exception to this would be if any information gives us cause for concern about your health or safety or that of others.

What will happen to the results of the study?

The project is due to be completed in October 2008, after which we can send you a written summary of the results. We intend to publish the results of the study in doctoral theses and in a scientific or medical journal. You will not be identified in any report or publication.

Who is organising and funding the research?

This study is a collaboration between researchers at University College London and clinicians at University College London Hospitals NHS Trust. It is being conducted

as part of the doctoral research of three post-graduate students in clinical psychology at UCL, with a small amount of funding from UCL.

Who has reviewed the study?

All research in the NHS is reviewed by a Research Ethics Committee (an independent group of people) before it can proceed. This study has been reviewed and given favourable opinion by the Camden and Islington Community Local Research Ethics Committee.

Further information and contact details

Please do not hesitate to contact one of the project team members for further information or if you have any questions about the study.

Dr Nancy Pistrang
Senior Lecturer in Clinical Psychology

Dr Sue Gessler
Consultant Clinical Psychologist

Rebecca Delmar-Morgan
Trainee Clinical Psychologist

Henrietta Saunders
Trainee Clinical Psychologist

Lois Thomas
Trainee Clinical Psychologist

Thank you for taking the time to read this information sheet. Please keep it for future reference.

Appendix 4: Consent Form

University College London Hospitals NHS
NHS Foundation Trust

UCLH Gynaecological Cancer Centre
Elizabeth Garrett Anderson Hospital
Huntley Street
LONDON WC1E 6DH

Version: 1
Date: 23.02.07
REC reference number: 07/Q0511/17
Patient Identification Number for this study:

CONSENT FORM

Title of Project: Hospital Diary Study

Name of Principal Investigator: Dr Nancy Pistrang

		Please initial box
1.	I confirm that I have read and understand the information sheet dated.....(version.....) for the above study and have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2.	I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.	☐
3.	I agree to my hospital consultant being informed of my participation in the study.	☐
4.	I understand that the daily diary that I write will be analysed by computer in an anonymous form, together with writing from other patients. I give permission for quotations from my writing to be used in reports or scientific publications, with all names and other identifying information removed.	☐
5.	I agree to take part in the above study.	☐

Name of Patient	Date	Signature
Name of Person taking consent	Date	Signature

When completed: 1 for patient, 1 for researcher site file, 1 to be kept in medical notes.

Appendix 5: Writing Instructions

Writing Instructions

Expressive Writing Condition

"What we would like you to write about for these four sessions are your deepest thoughts and feelings about your surgery or illness. You might think about all the various feelings and changes that you have experienced before being diagnosed, after diagnosis, before surgery and now. Whatever you choose to write, we want you to really let go and explore your very deepest emotions and thoughts. Ideally, we would like you to focus on feelings, thoughts or changes that you have not discussed in great detail with others. You might also tie these thoughts and feelings to other parts of your life i.e. your childhood, people you love, who you are, who you want to be etc. Again, the most important part is that you really focus on your deepest emotions and thoughts. The only rule we have is that you write continuously for the entire time. If you run out of things to say, just repeat what you have already written. Don't worry about grammar, spelling, sentence structure or crossing things out. Just write"

Neutral Writing Condition

"What we would like you to write during these four sessions is a factual account of life on the ward during the last 24 hours. For instance, you may choose to describe the daily routine or timetables of activities, the different people on the ward and what they have been doing, the hospital food, the physical surroundings etc. The most important part is that you describe what is happening as a 'detached observer', rather than write about your own personal thoughts and feelings. The only rule we have is that you write continuously for the entire time. If you run out of things to say, just repeat what you have already written. Don't worry about grammar, spelling, sentence structure or crossing things out. Just write."