

Effects of Emotional Disclosure on Psychological and Physiological Outcomes in Patients with Rheumatoid Arthritis: An Exploratory Home-based Study

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Abstract

The effects of an exploratory, home-based emotional disclosure intervention on psychological and physiological outcomes were assessed in patients with rheumatoid arthritis. Patients were randomly assigned to a disclosure group ($n = 19$) in which they wrote/talked about traumatic personal experiences, or to a control group ($n = 15$) in which they wrote/talked about the events of a particular day. Participants undertook these tasks for periods of 20 minutes on 4 consecutive days. The disclosure group demonstrated increases in negative mood and objective markers of disease activity at 1 week post-intervention. However, there were significant trends for the disclosure group to demonstrate minor improvements in mood and stability in disease activity, compared with the control group. These group differences appeared to be due to deteriorations in the control group more than improvements in the disclosure group.

Keywords

disease activity, emotional disclosure, inhibition, rheumatoid arthritis, stress

Introduction

EMOTIONAL disclosure refers to the process of writing or talking about personally stressful and traumatic events. An experimental protocol for assessing the effectiveness of disclosure was originally devised by Pennebaker and colleagues. The procedure involves participants talking or writing for approximately 20 minutes about a personal event in private on 4 consecutive days. This process is compared with a control condition in which the participant writes or talks about an unemotional topic, often a description of the day's events. This, or very similar paradigms have subsequently been associated with improvements in a variety of outcomes including improvements in emotional well-being (Lutgendorf & Antoni, 1999), reductions in self-reported symptoms (Greenberg & Stone, 1992), fewer physician visits (Greenberg, Wortman, & Stone, 1996; Pennebaker & Beall, 1986) and improvements in mood (Pennebaker, Colder, & Sharp, 1990). The procedure has also been associated with improvements in several immune parameters including: T-cell proliferation (Knapp et al., 1992), antibody responses following vaccination (Petrie, Booth, Pennebaker, Davison, & Thomas, 1995) and antibody control of latent infections (Esterling, Antoni, Fletcher, Marguiles, & Schneiderman, 1994).

Much of this early research however, focused upon healthy samples, prompting an interest in recent years in the effects of disclosure in clinical groups. Patient groups in which psychosocial and immunological improvements may have implications for disease activity attracted particular interest. One such group are patients with rheumatoid arthritis (RA). The selection of RA patients is appropriate for two main reasons. First, RA is a chronic debilitating disease, symptoms of which are often exacerbated at times of distress (Zautra et al., 1999). Any intervention that can reduce feelings of distress could therefore reduce the risk or severity of symptom flare-ups. Second, RA is an immune-mediated inflammatory disease. The beneficial immune changes associated with this intervention could, therefore, result in reductions in inflammation and hence symptom severity, which, in turn, could lead to improvements in physical and emotional well-being.

Two previous studies (Kelley, Lumley, & Leisen, 1997 and Smythe, Stone, Hurewitz, & Kaell, 1999) have assessed the effects of emotional disclosure on RA patients. Kelley et al. (1997) reported improvements in physical functioning, pain and affective disturbance three months after a verbal disclosure intervention. Similarly, Smythe et al. (1999) observed reductions in disease activity, as assessed by clinical examination, over a four-month period following a written disclosure intervention.

The current study was also designed to explore the impact of emotional disclosure in RA. However, several methodological modifications were introduced to expand the scope of the protocol, make use of relevant outcomes in RA and make better provision for the sample population. First, Smythe et al. (1999) recruited only those patients who were able to write for a 20-minute period. However, this criterion may have inadvertently excluded those patients with moderate to severe disease for whom extended periods of writing can be difficult. Thus, in the present study, patients were able to take breaks as required during the writing task, but to aim for a total writing period of approximately 20 minutes. In addition, all patients were given the choice of engaging in written or verbal disclosure. Previous work (Esterling et al., 1994) has indicated that both verbal and written approaches are effective, resulting in only marginally different outcomes. In this way, the current protocol allowed us to recruit patients across the whole spectrum of disease severity.

Second, with regard to outcomes, the studies of Kelley et al. (1997) and Smythe et al. (1999) provided evidence in support of the disclosure process, in reducing the physical and emotional symptoms of the disease. However, physiological indices of disease activity were not examined. The measurement of such indices not only provide objective data regarding the effects of the intervention, but may also illuminate potential mechanisms by which disclosure may affect disease activity. Thus, the current study assessed several physiological outcomes following the disclosure process. As with the two previous studies, we assessed the physical symptoms of RA through physical examination, and psychosocial factors via patient self-report

questionnaires. In addition, two objective measures of disease activity were also monitored: erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP). These are measures of inflammation and provide markers for clinical status in rheumatic disease (Weinstein & Del Giudice, 1994). However, the markers differ in their sensitivity and natural time course, with ESR levels taking up to four weeks to return to normal following a period of inflammation (Wolfe, 1997). In contrast, CRP is temporally more sensitive and is only raised during periods of acute inflammation (Kushner, 1991). Thus, the measurement of both allowed us to explore acute and more long-term changes in inflammation.

Finally, we also introduced some modifications to the disclosure paradigm itself. The disclosure process was adapted to enable patients to take part in the intervention in their own homes. Pennebaker suggests that the disclosure procedure should take place in a controlled environment; consequently, the majority of previous studies have taken place in laboratory conditions. However, reduced mobility is a ubiquitous feature of RA. Thus it was considered that enabling patients to conduct the intervention in their own homes may be preferred by patients and could also help to maximize patient recruitment and retention.

One previous study utilized a home-based writing intervention (Sheffield, Duncan, Thomson, & Johal, 2002) in a healthy student sample. Participants were tested at baseline and then given instructions on the disclosure process to take home with them. However, the absence of contact during the intervention week resulted in reduced adherence to task instructions. Thus, in the current study, strict instructions regarding the time, duration and location of writing were agreed prior to the intervention. In addition, patients were contacted by telephone immediately prior to and after each disclosure session. The current procedure, therefore, utilized the flexibility of the home setting, while, as far as possible, adhering to suggested laboratory protocol.

In summary, the present pilot study examined the effects of emotional disclosure on the physical and emotional well-being of patients with RA. Several methodological changes were introduced to: (1) maximize the acceptability of

the intervention; and (2) enable enquiry into the physiological mechanisms underlying the intervention. In line with previous research, it was hypothesized that improvements in emotional well-being would be observed in the disclosure group across the study period. In addition, improvements in objective markers of disease activity (numbers of tender and swollen joints, and markers of inflammation) were expected.

Methods

Recruitment and retention

Potential patients were first identified by a consultant rheumatologist and then approached by a researcher who was blinded to subsequent group allocation. Patients were told that we were conducting 'a study to assess the effects of writing or talking about particular topics on the symptoms of RA, in particular, we are interested in how the topics make you feel and what effect this has on the symptoms of your RA'. A total of 130 patients were approached, of which, 45 agreed to participate. However, three patients failed to attend their first appointment leaving 42 patients who were tested at baseline. A further nine patients withdrew during the intervention. One patient reported that the disclosure process was too upsetting while the remaining patients dropped out owing to ill-health ($n = 5$), family problems ($n = 2$) or because they had been called in for an operation ($n = 1$). Thus, a total of 34 (26.2% of approached sample) patients (19 disclosure, 15 control) completed the study.

Participants

All patients had a diagnosis of RA. Inclusion criteria included that patients were: (a) not, at time of recruitment, undergoing any form of psychotherapy; (b) did not have a diagnosis of dementia; and (c) did not have any other rheumatological or other major illness.

Outcome measures

Clinical status The disease activity score (DAS) involves the measurement of four variables: counts of the number of: (1) tender joints and; (2) swollen joints (28 joints are assessed during physical examination); (3) a patient self-report measure ('All things considered, how are you feeling'), measured using 100mm visual

analogue scale; and (4) a serum measure of inflammation, i.e. ESR. ESR is an indirect measure of acute phase reactions and provides a standardized and validated clinical index for assessing disease activity in RA (Fuchs, 1993). The DAS therefore allows for comparisons using either the total score or individual components of the DAS. The DAS ranges from 2 to 10, with scores below 2.6 indicating disease remission and scores above 5.1 indicating high disease activity.

CRP, another serum measure of inflammation, was also measured. CRP is an acute phase protein, levels of which fluctuate over a shorter time period than ESR (Kushner, 1991). CRP therefore provides an objective marker of disease activity in addition to the components of the DAS.

Mood The Short Form of Profile of Mood States (POMS-SF; Curran, Andykowski, & Studts, 1995) comprises six subscales that measure 'tension-anxiety', 'depression-dejection', 'anger-hostility', 'vigour-activity', 'fatigue-inertia' and 'confusion-bewilderment'. Subscores were combined to produce a measure of total mood disturbance.

Emotional reactions to the task Following each disclosure session patients provided information regarding how the writing/talking had made them feel. These questions comprised six-point Likert responses and patients indicated the extent to which their disclosed material was personal, emotional, disclosed previously or held back and how much they had wanted to tell others. Patients also completed the Stress and Arousal Checklist (SACL; Mackay, Cox, Burows, & Lazzarini, 1978) to indicate the extent to which they thought the writing/talking session was stressful or arousing.

Procedures

Design After recruitment patients were randomly assigned to the control or disclosure condition. The study comprised a baseline assessment, intervention, and then three follow-up appointments at one, six and ten weeks post-intervention. Baseline assessment and follow-up appointments were carried out in the clinic, however, patients carried out the intervention in their own homes, facilitated by a telephone call from a researcher.

Baseline assessment Patients completed questionnaires regarding demographic information, medical history and mood (POMS-SF, Curran et al., 1995). A physical examination was conducted and the numbers of tender and swollen joints recorded along with a self-report measure of patients' general perception of the impact of arthritis upon their lives at that time. Two blood samples were obtained for the quantification of ESR and CRP. Data from the physical examination, patient self-report and ESR were then combined to produce a measure of total disease activity (DAS; Fuchs, 1993). Patients were then given instructions regarding the disclosure task. Given the potential for difficulties in writing, patients were informed that if they were unable to write continuously for a 20-minute period they could either take as many breaks as required, or they could disclose verbally into a tape-recorder. Of the 34 patients who took part in the study, seven chose to disclose verbally. Patients were advised that the material they disclosed would be confidential and that they could keep the material or return it to the researcher. It was made clear that if they chose to give the material to the researcher that the content may be examined. Patients were informed that they would be contacted by telephone at a pre-arranged time and assigned a topic to write or talk about for a period of 20 minutes. Although no information regarding individual topics was given at this stage, patients were informed that it was possible that they could find some of the topics upsetting. However, the facilitator would be available by telephone should the need arise. Patients also decided upon a suitable time and place to conduct the task, that is, a time and place dedicated to the task, where they would not eat or drink, or be distracted in any way (e.g. away from TV, radio, telephone). This information was recorded in the disclosure diaries and given to the patients to take home as a reminder of the task.

Intervention The intervention took place one week following baseline assessment. On day one of the intervention, at the pre-arranged time, patients received a telephone call from a facilitator trained in the intervention protocol. Disclosure patients were given the following instructions: 'I want you to write about your deepest emotions and thoughts about the most

upsetting experience in your life. Really let go and explore your feelings and thoughts about it.'

If patients were unable to think of an experience, they were prompted to write about anything that had upset them significantly in the past. All disclosure patients were told that their chosen topic should be something that they had not previously discussed in depth and they were asked to be as emotional as possible by 'digging deep, letting go and exploring deepest feelings and emotions'. After 30 minutes the patient was contacted again and patients were asked to complete the questions in the diary regarding how the task made them feel, before sealing the diary and/or tape in a sealed envelope. For all the subsequent writing/talking sessions, patients were informed that they could write or talk about the same or a different topic. This procedure was followed for control and disclosure patients with the exception of the information regarding the assigned topic. Patients in the control condition were asked to write or talk about one of three topics: (1) to describe, in detail, everything they had done during that day; (2) were planning to do the following day; or (3) during the forthcoming weekend. Control patients were instructed that the description should be detailed and factual and to avoid emotion during their accounts.

Follow-up appointments Patients were followed-up one, six and ten weeks post-intervention. At the one-week follow-up patients were given the opportunity to give their

disclosure information to the researcher. All control and disclosure patients submitted their information for analysis. At each appointment the physical examination was repeated to provide information for the DAS (Fuchs, 1993), the POMS-SF repeated and two blood samples taken for the measurement of ESR and CRP.

Data analysis

Differences in disclosure information were assessed using independent samples *t*-tests. A series of mixed model repeated measures ANOVAs were used to examine differences in linear and quadratic trends between the groups across the study period. *F* and *t*-values are reported with associated *p*-values and a measure of effect size (ϵ).

Results

Demographic information

The demographic data for disclosure and control patients are presented in Table 1. No significant differences were observed at baseline.

Emotional reactions to the disclosure task

Post-writing/talking information was compared in disclosure and control patients for each of the four writing/talking diaries. No significant differences were observed between patients who chose verbal, hand-written or word-processed disclosure. Disclosure patients rated their writing/talking as more personal ($t(32) = 4.01$,

Table 1. Demographic information for disclosure and control groups

Patient characteristic	Disclosure group				Control group			
	<i>M</i>	<i>SD</i>	<i>N</i>	%	<i>M</i>	<i>SD</i>	<i>N</i>	%
<i>Sample demographics</i>								
<i>N</i>			19				15	
Age	62.7	13.6			58.6	14.7		
Sex								
Male			4	21			2	13
Female			15	79			13	87
Married			14	74			9	60
<i>Disease status</i>								
Duration	16.7	11.7			12.7	12.8		
DAS	4.0	1.2			4.1	1.16		
<i>Mood</i>								
Total mood disturbance	39.8	23.0			41.9	18.5		

$p < 0.001$), more emotional ($t(32) = 4.52, p < 0.001$) and more stressful ($t(32) = 1.96, p = 0.05$) than control patients. Disclosure patients also reported a greater wish to share their information ($t(32) = 5.92, p = 0.001$), but had actively held back from doing this ($t(32) = 3.09, p = 0.004$).

Effects of disclosure on disease outcomes

Analyses were conducted on the individual components of disease activity and the total disease activity score. A significant group linear trend for patients' global assessment of their disease activity ($F(1,26) = 4.81, p = 0.034, \epsilon = 0.16$) was observed. The groups did not differ at weeks 1 or 6; however, disclosure patients exhibited lower disease activity than controls at week 10. No other significant effects were observed, although patients' global assessments were indicative of a trend for disclosure patients to demonstrate small improvements or remain relatively stable on all disease outcome measures, while controls deteriorated. The mean data for all disease outcomes are presented in Table 2.

Effects of disclosure on mood outcomes

The mean scores for all mood outcomes are presented in Table 3. For fatigue, there was a significant group linear trend ($F(1,28) = 5.38, p = 0.028, \epsilon = 0.16$), characterized by stability in both groups between baseline and week 6; but a reduction in disclosure patients and an increase in controls at 10 weeks. Significant group x time

quadratic trends were observed for tension ($F(1,28) = 4.47, p = 0.04, \epsilon = 0.14$), anger, ($F(1,28) = 8.61, p = 0.007, \epsilon = 0.26$) and total mood disturbance ($F(1,28) = 4.56, p = 0.04, \epsilon = 0.14$), with disclosure patients demonstrating declines in negative mood scores at week 10. Conversely, controls demonstrated slight improvements at 1 and 6 weeks, but a return to baseline levels or worse at 10 weeks.

Discussion

The current study provides preliminary evidence for a beneficial effect of emotional disclosure on mood outcomes in RA, but not on clinical and physiological measures of disease activity. With regard to mood, the results revealed deterioration in several mood states at one week post-intervention in disclosure patients. This negative mood was sustained until six weeks. However, by ten weeks the disclosure group exhibited significant improvements in several of the mood indices. These results are consistent with those of Kelley et al. (1997).

In contrast, the indices of disease activity were suggestive of little change in the disclosure group and deterioration in the control group. For example, components of the DAS suggested reduced disease activity in disclosure patients by 10 weeks post-intervention, when compared with controls. However, it was evident that these differences were due to stability or slight improvements in disclosure patients and deterioration in controls across the study period. A similar pattern was evident for the physiological indices of disease activity, i.e. CRP

Table 2. Mean (sd) scores for disease outcomes in disclosure and control patients

	<i>Tender</i>	<i>Swollen</i>	<i>VAS</i>	<i>ESR</i>	<i>DAS</i>	<i>CRP</i>
<i>Disclosure</i>						
Baseline	4.4 (4.1)	4.8 (5.4)	22.7 (16.6)	22.8 (15.8)	4.0 (1.2)	23.4 (23.7)
1 week	4.9 (4.0)	4.8 (4.6)	30.0 (22.3)	29.4 (23.3)	3.9 (1.6)	25.6 (16.2)
6 week	4.4 (3.5)	3.7 (2.9)	31.2 (25.2)	21.2 (16.3)	3.8 (1.2)	20.3 (13.7)
10 week	4.6 (4.4)	3.7 (3.5)	25.0 (23.5)	28.9 (19.2)	4.0 (1.3)	21.9 (16.3)
<i>Control</i>						
Baseline	6.2 (4.9)	5.0 (2.6)	26.9 (21.6)	21.5 (19.4)	4.1 (1.2)	16.4 (8.7)
1 week	7.0 (5.5)	3.9 (3.0)	28.8 (23.9)	19.5 (15.4)	3.8 (1.3)	14.8 (8.1)
6 week	6.4 (4.1)	3.2 (2.3)	35.5 (20.3)	25.6 (27.6)	4.2 (1.4)	25.8 (30.8)
10 week	7.4 (3.8)	4.7 (4.6)	45.0 (24.1)	32.6 (20.6)	4.9 (1.0)	20.8 (15.3)

Notes: Tender = number of tender joints, Swollen = number of swollen joints, VAS = visual analogue scale for patient global assessment of disease activity, ESR = erythrocyte sedimentation rate, DAS = disease activity score, CRP = C-reactive protein

Table 3. Mood outcomes in disclosure and control patients

	<i>Tension</i>	<i>Depression</i>	<i>Anger</i>	<i>Vigour</i>	<i>Fatigue</i>	<i>Confusion</i>	<i>Total mood</i>
<i>Disclosure</i>							
Baseline	10.6 (4.4)	16.2 (8.5)	10.9 (4.2)	16.1 (3.8)	13.1 (6.0)	8.4 (2.8)	39.8 (23.0)
1 week	11.1 (5.2)	12.2 (5.9)	12.0 (5.5)	15.9 (5.6)	13.0 (7.1)	8.5 (3.7)	42.4 (28.0)
6 week	10.7 (5.1)	12.1 (6.8)	11.5 (6.1)	15.9 (4.8)	13.3 (5.9)	8.5 (3.6)	41.6 (29.3)
10 week	9.4 (5.1)	11.5 (6.7)	9.2 (5.7)	14.5 (6.3)	10.8 (6.1)	7.6 (2.9)	33.9 (26.1)
<i>Control</i>							
Baseline	10.7 (4.5)	13.3 (4.2)	11.9 (4.3)	14.3 (5.1)	12.1 (5.7)	8.3 (3.5)	41.9 (18.5)
1 week	9.4 (3.1)	11.6 (3.1)	9.9 (3.2)	13.8 (4.5)	13.2 (6.0)	8.3 (3.6)	38.6 (14.3)
6 week	9.7 (3.5)	11.5 (3.0)	9.9 (3.8)	14.1 (4.1)	13.3 (6.0)	7.9 (3.7)	38.2 (17.7)
10 week	10.4 (4.1)	12.1 (3.7)	11.2 (5.5)	13.4 (5.2)	15.3 (6.7)	7.8 (2.7)	43.5 (19.9)

and ESR. This pattern of stability of measures in the disclosure group and deterioration in controls has been reported previously. For example, Booth and colleagues (Booth, Petrie, & Pennebaker, 1997) reported elevated CD4 and CD8 levels in their control participants compared with relatively stable levels in the disclosure group. The authors suggested that the elevation in controls may have occurred as a result of natural fluctuations in immune parameters, while the stability in the disclosure group may be attributed to a buffering effect of the disclosure process. This buffering hypothesis may also account for the pattern of results observed in the present study.

These results have a number of implications for our understanding of the disclosure process and its effects on patients with RA in particular. First, several groups have previously reported an initial deterioration in measures of mood, followed by a significant improvement. This pattern of results may offer some insight into the mechanisms underlying disclosure. Specifically, Baum (1990) has suggested that affective arousal may be necessary, but not sufficient for emotional disclosure to be effective. Indeed, Van der Kolk and Van der Hart (1991) suggest that the efficacy of emotional disclosure is dependent upon, first, accessing affectively charged memories and, then, restructuring the memories and successfully integrating them into an existing mental schema. Although the present study did not set out to examine this hypothesis explicitly, it is possible that the pattern of an immediate deterioration in mood, followed by improvements mirrors the process of accessing negative memories (resulting in increased negative mood) and then

restructuring and integrating these memories (resulting in greater positive mood). This hypothesis is clearly worthy of further enquiry and also advocates the assessment of mood immediately after the intervention and for a considerable period post-intervention.

Second, with regard to the effects of the intervention on disease activity the results suggest that, at best, emotional disclosure exerts a buffering effect in patients with RA, resulting in stability in disease activity across the study period. However, at worst, it is conceivable that, rather than a buffering effect, the paradigm exerted a deleterious effect on control participants. Control patients were asked to describe, in a factual manner, what they had done that day or what they planned to do the following day. In a healthy population such an exercise would be expected to be neutral. However, in a population where daily activities are hindered by disease symptoms, it is more difficult to avoid emotion when describing tasks that may cause great frustration. Indeed, several control participants reported this anecdotally. Thus, for some patient groups, the classic control condition may not be sufficiently neutral, but may actually result in greater distress.

This suggestion raises the possibility that an alternative control task may be required for research with certain clinical populations. To date, a few alternatives have been described including: describing neutral pictures (Kelley et al., 1997) or the most recent social event attended (Sheffield et al., 2002). However, these approaches still have the potential to elicit emotion. It may, therefore, be timely for investigators to consider the development of alternative control conditions that are more

likely to be neutral, while also exhibiting face validity.

A third implication of our findings concerns the modification to the methodology to enable patients to conduct the intervention in their own homes. We observed total adherence to the study protocol, and no difficulties with regard to the completion of the disclosure process. Given the potential for reduced mobility in this population, the ability to conduct the disclosure procedure in the patients' own homes was obviously advantageous. However, the successful transfer of the disclosure paradigm to the home environment is likely to have been due to the explicit instructions regarding the disclosure process given prior to the intervention, and also the continual contact with patients during the disclosure process. The present authors consider that these factors were critical in achieving adherence with the study protocol.

Limitations

The previous discussion must, however, be tempered by a consideration of the main limitations of this work. First, the follow-up period in this investigation was relatively brief. Our data suggest that follow-ups at one, six and ten weeks allow one to capture the initial deterioration in outcomes, typical of emotional disclosure, as well as some of the early signs of post-disclosure improvements. However, the medium and long-term effects of disclosure could not be assessed. It is evident that longer follow-up periods are necessary in order to examine not only more distal changes, but also the permanence of these changes. Second, the relatively small sample size meant that many of the significant differences between groups were only evident when examining linear and quadratic trends. This approach has been adopted by others (e.g. Kelley et al., 1997), however, larger sample sizes allow for a clearer delineation of differences between groups. Given the small sample size and the number of statistical analyses conducted it is also noted that a liberal alpha correction would eliminate many of the significant findings reported. However, the consistent patterns observed between disclosure and control patients on a variety of psychological and physiological outcomes, suggest the need for a larger study of these outcomes.

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