Postoperative Course After Papilloma Resection: Effects of Written Disclosure of the Experience in Subjects With Different Alexithymia Levels

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Objective: The aim of the investigation was to assess the effects on postoperative course after bladder papilloma resection of a technique for the written disclosure of traumatic events in interaction with individual differences in alexithymia. **Methods:** Forty subjects were administered a general questionnaire and the Toronto Alexithymia Scale (TAS-20) the second day after admittance. Twenty subjects were asked to write for 3 days, 20 minutes a day, about their experience of being in the hospital, following instructions developed by J. W. Pennebaker and coworkers. The postoperative course was assessed objectively by the duration of stay in hospital and subjectively by subjects completing the Symptom Check List 90 (SCL-90) the day before leaving the hospital. **Results:** Subjects who wrote stayed fewer days in hospital and had lower SCL-90 scores. The same effect was shown by low alexithymia levels. Study of interactions showed that the effect of writing was apparent only in subjects high in alexithymia, whereas subjects low in alexithymia showed a favorable course independent of writing. **Conclusions:** Writing about one's thoughts and feelings about being in hospital for a surgical operation has beneficial effects on postoperative course. This holds particularly true for high alexithymic subjects, who obtain through writing the same outcome as low alexithymic subjects. **Key words:** written disclosure, alexithymia, surgical operation, health, traumatic event.

SCL-90 = Symptom Check List 90; TAS-20 = 20-item Toronto Alexithymia Scale.

INTRODUCTION

The cognitive/emotional processing of experience, when traumatic or distressful in particular, was recognized as having a deep impact on physical and mental health both in the psychoanalytic tradition (1, 2) and in contemporary empirical research (3–5). Unresolved (ie, nonprocessed) trauma is nowadays believed to exert a negative influence on the health not only of the individual involved but also of subsequent generations; again this was found to be true both in clinical studies (6) and in empirical attachment research (7).

Translating experience, including its emotional aspects, into words is considered as playing an important role in this processing since Anna O. spoke of her "talking cure" (1). Contemporary constructs centered on this translation are, for instance, alexithymia (8) and the Multiple Code Theory (9).

In the late 1980s J. Pennebaker and coworkers explored the possibility of facilitating cognitive/emotional processing of stressful experience through writing. Subjects in different situations were requested to write about an assigned topic for a certain number of consecutive days (generally 4), for a definite number of minutes (from 15 to 30). The topic assigned in different investigations was in some cases the most traumatic episode of one's life, in others a specific experience common to the group of subjects involved (eg, being laid off from work). Very encouraging results were obtained: subjects who wrote showed, among other results, a reduction in doctor visits in the following year (4), a better immune response (11), a stronger response to vaccination (12), faster times in getting new jobs (13, 14). In a meta-analysis performed on all papers published to date, Smyth (15) found overall effects that were not only significant but of remarkable size. The effect was stronger, among other combined measures, for "psychological well-being" and "physiological functioning" (ie, objective physical health measures).

The effect of the procedure, more than to released inhibition as originally suggested (16), is nowadays attributed mainly to cognitive processing of the traumatic memory, that is, transduction of the traumatic experience into a linguistic structure that promotes assimilation and understanding of the event and reduces negative affect associated with thoughts of the event (17). This explanation is supported by an association between increased use of cognitive words and health benefits (17).

An important aspect of writing is the construction of a narrative. As formulated by Pennebaker and Seagal (10), it helps to organize the many facets of an event into a more coherent set, allowing the mind to work more easily on it, having ready access to the relevant factual and emotional data; this facilitates giving meaning to an event and managing the emotions associated with it. "In this way, having a narrative is similar to completing a job, allowing one to essentially forget the event." A recent study by Smyth et al. (18) demonstrated that a narrative structure, as opposed to

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a fragmented structure (a separate listing of facts, thoughts, and emotions), in the report of a traumatic event was necessary for beneficial health effects to take place.

The finding of significant variance of effect sizes among different studies (15) suggested the assessment of moderating variables. Pertaining to the present study are the findings that a better outcome was found for writing about current traumas and that the most affected outcome measures were psychological well-being and physiological functioning (15).

It is to be expected that features of subjects involved may influence the effect of the technique. Population differences examined, such as students vs. nonstudents, did not seem significant, and the same was true for age; gender, on the other hand, seemed to exert an influence: effects were larger in males.

Among individual differences, baseline capacity for cognitive/emotional processing of experience, and for its translation into words, certainly deserves to be taken generally into account: one might formulate the hypothesis that subjects high in these dimensions might make better use of the writing technique or, on the contrary, that no further health improvement might be obtained because of a ceiling effect. We know of an investigation directly studying this problem: Paez et al. (19) found that subjects high in "difficulty in describing feelings," the second factor of the alexithymia construct (20), showed a stronger effect of the writing technique on self-reported measures of affect than subjects with low scores on that factor. Indirect evidence is given by a study (21) showing that hostile and suspicious individuals seemed to benefit more from the procedure; a stronger effect in men, as found in the meta-analysis (15), was attributed to possibly lower prewriting levels of emotional expression. The evidence so far seems to favor the idea that greater benefits from the writing technique are obtained by subjects who originally show less contact with emotional experience so that the experimental procedure favors activation of previously not readily available resources (what some might call a therapeutic effect).

In most cases the technique has been used, to our knowledge, in promoting better health in subjects with no apparent need, help request, or pathology. This is very interesting from a theoretical point of view because it shows the possibility of promoting health in individuals independently of a clinical request due to a manifest pathology and because it eliminates a problem that has proven to be more or less difficult to solve in psychotherapy outcome research, that is, equating motivation in treated and control groups: all the work done with writing was done with subjects with no previous motivation for the technique, either in the experimental or control groups. The results obtained may therefore be considered as a truly experimental demonstration of the bodily effects of a psychological procedure.

At this point, however, clinical use of the technique deserves to be considered. This is, in fact, being studied by a Dutch group using the Internet (22) for the treatment of posttraumatic stress disorders. For somatic conditions, we know of two papers (23, 24) in which the clinical condition of asthmatic and arthritic patients seemed significantly improved by application of the technique.

We decided to study the effects of writing on the course of a surgical operation rather than on chronic conditions because an operation more definitely constitutes a distressful event requiring cognitive-emotional processing. We chose a relatively minor operation, a bladder papilloma intraurethral resection, because in our view it allowed for an optimal amount of variance in the postoperative course among subjects: it requires a certain number of days before discharge but very infrequently causes major complications that might increase variance excessively. On the other hand, though rather straightforward from a technical point of view, the operation carries high symbolic weight because of the area involved and seems to require intensive emotional working-through.

The first aim of the present study was to assess the effects of the writing technique on the postoperative course in a group of patients undergoing bladder papilloma resection, as measured both by objective health indicators (such as duration of stay in hospital after the operation) and by subjective indicators of well-being (such as a symptom checklist). The second aim was to investigate the interaction of writing with baseline alexithymia levels of subjects, that is, their (non) capacity for cognitive/emotional processing of experience, in the hypothesis that subjects high in alexithymia would show greater benefits from the procedure. The third aim was to confirm the effect of the alexithymia dimension, taken as a whole and in its three component factors, in mediating health consequences of a stressful situation such as a surgical operation. In fact, though relationships between alexithymia and health are well known and demonstrated worldwide (eg, Ref. 8), the dimension was not commonly studied, to our knowledge, in its properties as a "buffer" in respect to an actual stressful situation. In a preceding study of our group (25), alexithymia did in fact predict subsequent incidence of physical disease in a group of subjects who had experienced a major earthquake.

METHODS

Subjects

Subjects were 40 inpatients of the Urology ward of the Policlinico Umberto I, Rome, waiting to undergo resection of a papilloma of the bladder through a transurethral endoscopic procedure. Criteria for inclusion were as follows: education level not inferior to a lower secondary school certificate (8 years of education), to ensure writing capacities; specific surgical risk (Goldman index, Ref. 26) equal to 0, which indicates the total absence of chronic diseases that might influence the postoperative course; and age not higher than 65. Features of the actual group were as follows: 32 males (80%) and 8 females (20%); mean age, 55.75 years; mean years of education, 10.38; 30 married (75%), 3 single (7.5%), 3 divorced (7.5%), and 4 widowed (10%); and 20 working (50%) and 20 retired. All the above-mentioned variables were evenly distributed in the two writing and nonwriting groups.

Measures

General Questionnaire. This questionnaire included sociodemographic information (age, sex, education, occupation, marital status) and information on alcohol, cigarette, and drug use; level of physical exercise; and previous operations of the same kind.

Twenty-Item Toronto Alexithymia Scale (TAS-20). On this 20-item self-report scale (20), each item is scored from 1 to 5. The scale yields a total alexithymia score and scores for three factors: F1, difficulty identifying feelings; F2, difficulty describing feelings to others; and F3, externally oriented thinking. We used the Italian version of the scale (27).

Symptom Check List (SCL-90). On this 90-item self-report scale, each item represents a physical or psychic symptom and is scored from 1 to 5 depending on its presence and frequency in the last week (28). The scale was used in its Italian version (29) to assess the level of distress experienced by the patient during the period of hospitalization.

Postoperative course record. This was taken on a specific form developed for this investigation and included general clinical data (days of stay in hospital, alterations in electrocardiogram, temperature, pressure or hematological data, days until resumption of mouth feeding) and a series of data specific for urological patients (number of days of bladder lavage, presence of anemia and infections, need for transfusion). On the basis of this record the physician in charge gave an overall evaluation of the postoperative course on a four-point scale (poor, mediocre, fair, good).

Testing and Writing Procedure

Time1: Before the operation. The second day after their admittance to the ward all subjects who met the inclusion criteria were asked to participate in a study investigating the experience of a surgical operation through patients' reports. Only five patients (12.5%) among those asked refused to participate. Each subsequent subject was assigned either to the writing or to the nonwriting condition until a total of 20 was reached for each group. Assignment was made in such as way as to ensure the highest possible similarity between the two groups on independent variables such as age, sex, education, occupation, marital status, use of alcohol, cigarettes, and drugs, physical exercise level, and number of previous operations of the same kind. It was also ensured that a subject assigned to the writing condition was never in the same hospital room of a control subject. All participants filled in the General Questionnaire and the TAS-20. Each patient of the writing group wrote for 3 days, 20 minutes a day, in a specific room where quiet and privacy were ensured, about his or her thoughts, emotions, and worries about the operation and the experience of being in hospital.

We used the instructions developed by Pennebaker's group (eg, 10 and 30), translated and adapted[1] for the specific situation: "For the next 3 days, I would like you to write about your very deepest thoughts and feelings about the operation you are about to undergo. All of your writing will be completely confidential. You may write of your experience with hospital life, of present relationships with your family, with the medical staff and with other patients; you may write of the operation, of what you feel and expect about it; these are only examples. The important thing is that in your writing you really let go and explore your very deepest emotions and thoughts. Do not worry about grammar or about using correct Italian: the only rule is that once you start writing, you go on writing until the end of the time period (20 minutes)."

The time between the first writing session and operation ranged from 3 to 4 days. Control subjects stayed in hospital for a similar period, in no case less than 3 days, before the operation.[2] Papilloma resection, as noted above, was performed in all subjects through transurethral endoscopy under epidural anesthesia.

Time 2: After the operation. The different indexes of the postoperative course (see "Measures") were recorded. On the basis of these data, the physician gave an overall evaluation of the course on a four-point scale.

The day before discharge from hospital all 40 patients filled in the SCL-90.

Statistical Analyses

Factorial analyses of variance were performed using alexithymia (above/below the median)[3] and group (writing/nonwriting) as independent variables and the different indicators of the postoperative course as dependent variables: days of stay in hospital after the operation, SCL-90 scores, and overall medical evaluation.

RESULTS

Writing and nonwriting groups did not differ significantly on any of the control measures considered (see Table 1). The same was true for groups constructed by splitting the total group of 40 subjects above or below the median alexithymia score (Table 2).

Writing showed a main effect on both postoperative days of stay in hospital (writing: mean = 3.15, SD = 1.27; nonwriting: mean = 4.50, SD = 1.64; $F = 10.48$; $p < .002$) and SCL-90 scores (writing: mean = 38.50,

[1] The instructions in Italian are available from the authors.

[2] In this ward, subjects are never operated on before at least 3 days of assessment. Therefore, timing of the operation was totally unrelated to writing.

[3] We decided to use this solution instead of classifying subjects along extreme cutoff scores (true alexithymic >61, nonalexithymic <51, intermediate from 51 to 61) since this would have generated three groups, at least one of which would be very small, and this would have strongly reduced the power of statistical analysis. We were also more interested in the general effects of the variable than in the effects of being extremely alexithymic. The same solution was used by Paez et al. (19).

TABLE 1. Sociodemographic and Health Features of Writing and Nonwriting Groups

Independent Variable	Writing	Nonwriting	*F*	*p*
Age (y), mean	54.90	55.25	0.009	.92
Men	16	16		
Women	4	4		
Education (y, mean)	10.50	10.25	0.06	.80
Working	11	9	0.40	.52
Retired	9	11	0.40	.52
Married	16	14	0.53	.46
Not married	4	6	0.53	.46
Alcohol units (mean/day)	1.1	2.3	3.55	.06
Cigarettes (mean/day)	3	7.95	2.66	.11
Physical exercise (min/wk)	147	84	0.97	.33
Number of subjects chronically using drugs for any purpose	13	12	0.10	.74
Mean number of previous resections	0.55	0.85	0.37	.54

TABLE 2. Sociodemographic and Health Features of High and Low Alexithymic Groups

Independent Variable	High Alexithymia	Low Alexithymia	*F*	*p*
Age (y), mean	58	52.15	2.756	.11
Men	16	16		
Women	4	4		
Education (y), mean	10.25	10.50	0.06	.81
Working	8	12	1.600	.21
Retired	12	8	1.600	.21
Married	14	16	0.53	.47
Not married	6	4	0.53	.47
Alcohol units (mean/day)	1.15	2.25	2.942	.09
Cigarettes (mean/day)	6.60	4.35	0.521	.47
Physical exercise (min/wk)	102	129	0.174	.68
Number of subjects chronically using drugs for any purpose	14	11	0.96	.33
Mean number of previous resections	0.50	0.90	0.67	.42

SD = 23.80; nonwriting: mean = 63.55, SD = 41.58; $F = 6.91$; $p < .02$). As to single SCL-90 scores, significantly lower scores in writing subjects were obtained for obsessive-compulsive ($p = .008$), depression ($p < .03$), anxiety ($p < .006$), phobic anxiety ($p < .04$), and psychoticism ($p < .006$), but differences were not significant for somatization ($p < .07$), interpersonal sensitivity, hostility, and paranoid ideation. Only a strong trend was present for overall medical evaluation (writing: mean = 3.45, SD = 0.69; nonwriting: mean = 2.95, SD = 1.00; $F = 3.76$; $p = .06$).

Alexithymia showed main effects on all aspects considered: postoperative days of stay in hospital (high alexithymic group: mean = 4.50, SD = 1.61; low alexithymic group: mean = 3.15, SD = 1.31; $F = 10.48$; $p = .002$); SCL-90 scores (high alexithymic: mean = 63.30, SD = 33.39; low alexithymic: mean = 38.75, SD = 32.49; $F = 6.64$; $p < .02$); and medical evaluation (high alexithymic: mean = 2.85, SD = 0.93; low alexithymic: mean = 3.55, SD = 0.69; $F = 7.73$; $p = .01$). (Notice that the effect sizes of the two variables, writing and alexithymia, are similar). Among single alexithymia factors, only factor 1 (difficulty identifying feelings) showed a significant main effect (high factor 1: mean = 4.35, SD = 1.63; low factor 1: mean = 3.30, SD = 1.42; $p < .05$) on postoperative days of stay in hospital; all other differences were in the same direction as those shown by the entire scale.

Interaction between writing and alexithymia on postoperative days of stay in hospital (Fig. 1) was only close to significance ($F = 2.35$; $p = .13$). However, in post hoc comparisons, the difference between writing and nonwriting subjects proved significant only in the high alexithymic group (writing: mean = 3.50, SD = 1.51; nonwriting: mean = 5.50, SD = 0.97; $F = 12.41$; $p = .002$), whereas it was not significant in the low alexithymic group (writing: mean = 2.80, SD = 0.92; nonwriting: mean = 3.50, SD = 1.58; $F = 1.47$; $p = .23$).

Interaction between writing and single alexithymia factors on postoperative days of stay in hospital proved significant only for factor 2 (difficulty describing feelings to others) (Table 3).

Interaction between writing and alexithymia on SCL-90 scores (Fig. 2) was significant ($F = 7.20$, $p <$

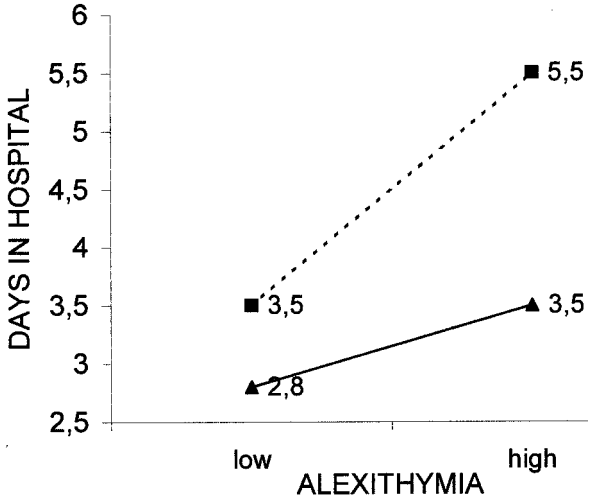

Fig. 1. Interaction between writing and alexithymia on days of stay in hospital. &OV0052; = writing group; &OV0014; = nonwriting group.

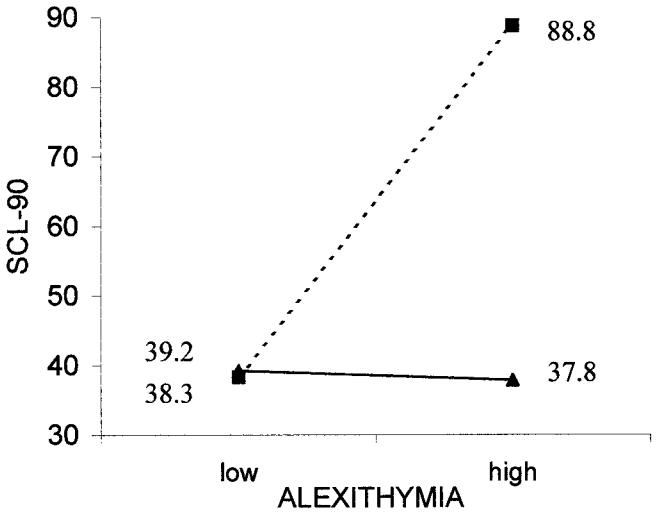

Fig. 2. Interaction between writing and alexithymia on SCL-90 scores. &OV0052; = writing group; &OV0014; = nonwriting group.

TABLE 3. Interaction Between Writing and Alexithymia Factor Scores on Postoperative Days of Stay in Hospital

	Low Factor 1	High Factor 1	*F*	*p*
Writing	2.91 ± .83	3.44 ± 1.67	0.753	.39
Nonwriting	3.78 ± 1.86	5.09 ± 1.22		
	Low Factor 2	High Factor 2		
Writing	3.46 ± 1.51	2.78 ± .83	6.303	.02*
Nonwriting	3.67 ± 1.23	5.18 ± 1.66		
	Low Factor 3	High Factor 3		
Writing	3.09 ± 1.30	3.22 ± 1.30	1.706	.20
Nonwriting	3.78 ± 1.30	5.09 ± 1.70		

TABLE 4. Interaction Between Writing and Alexithymia Factor Scores on SCL-90 Scores

	Low Factor 1	High Factor 1	*F*	*p*
Writing	34.91 ± 30.65	42.89 ± 11.45	0.080	.77
Nonwriting	55.78 ± 36.08	69.91 ± 46.31		
	Low Factor 2	High Factor 2		
Writing	42.64 ± 28.45	33.44 ± 16.77	5.267	.03*
Nonwriting	43.11 ± 35.46	80.27 ± 39.94		
	Low Factor 3	High Factor 3		
Writing	36.00 ± 16.17	41.56 ± 31.61	0.185	.67
Nonwriting	55.33 ± 42.47	70.27 ± 41.60		

.02). Post hoc comparisons showed a highly significant difference in the high alexithymic group (writing: mean = 37.80, SD = 18.16; nonwriting: mean = 88.80, SD = 29.49; $F = 21.69$; $p = .0002$) whereas in the low alexithymic group the difference was nonsignificant (writing: mean = 39.20, SD = 29.41; nonwriting: mean = 38.30, SD = 36.92; $F = 3.64$; $p = .95$).

Interaction between writing and single alexithymia factors on SCL-90 total scores proved significant only for factor 2 (difficulty describing feelings to others) (Table 4).

Interaction between writing and alexithymia, both total score and factors, on the overall medical evaluation was nonsignificant.

On a qualitative, clinical level, reports from high alexithymic subjects seemed to us shorter and showed little reference to emotion; they were mainly a report of what took place in the hospital ward: lists of blood tests and other assessment procedures, accurate descriptions of food distributed in the ward, and complaints of different kinds. Reports from low alexithymic subjects were longer and seemed richer in articulate descriptions of feelings, of personal events happening both inside and outside the hospital, and of their family life. The reports from these two groups dealt with different topics, with patients in the high alexithymic group concentrating on the here and now of their hospital life.

DISCUSSION

All of the hypotheses guiding this study were generally confirmed in our sample.

The writing technique seemed once again to be effective in the new situation investigated, of subjects undergoing a relatively minor surgical operation: Subjects who wrote of their thoughts and emotions about their hospital experience showed a better course from the point of view of both objective evaluation (30% less time in hospital after the operation) and of subjective well-being (about half the symptoms reported). Results are all the more plausible because they were obtained under the same conditions that in Smyth's

(15) meta-analysis seemed to yield stronger effects: writing about a current event, a predominantly male sample, outcome measures that may be labeled as physiological functioning (postoperative stay in hospital as an index of wound healing) and psychological well-being (SCL-90 scores).

Similar results were shown by low alexithymic subjects, that is, subjects who basically showed a good capacity for processing, identification, and verbal expression of emotion. When interaction was considered, high alexithymic subjects who wrote showed a course that was not only much more favorable than that of high alexithymic subjects who did not write but also very similar to that of low alexithymic subjects, whether writing or nonwriting. The latter in fact, as reported by Paez et al. (19) and suggested in our hypothesis, showed little benefit from writing, as if their emotional processing of the experience were already optimal (ceiling effect) and could not be further improved by writing. It may be suggested that these subjects probably processed the experience within themselves or by talking with friends and relatives regardless of whether they were writing or not. On the whole our data once again confirm the importance of emotional processing of a significant experience for subsequent physical and mental health. They also seem to confirm the idea put forward by Pennebaker et al. (17) that the key factor explaining the effects of writing is its capacity to promote translation of the experience and of its accompanying images and emotions into language so that all features of the experience are encoded and stored in a more organized, coherent, and simplified manner.

The results obtained from this investigation support further clinical application of the writing technique in health care, particularly around significant and/or stressful moments. Reduction of hospital stay of an average of 1.5 days is an important result not only as an indicator of easier recovery for patients but also in economic terms since it means a reduction of costs for the health services and of workdays lost.

Psychological support is often supplied for patients with severe pathologies (cancer, HIV infection) or undergoing chemotherapy or radiation therapy. But professional support is not always accepted by all patients, and it is sometimes offered mainly to those showing evident mental distress. This may leave out just those subjects (ie, alexithymic) who are more in need of being helped in their cognitive/emotional processing of the experience. Writing, on the other hand, may be offered to and accepted by most people with little cost and with no need for the patient to consider himself or herself as needing psychological help; the procedure may be presented as a universal practice of the ward or service. It is obvious, though, that cases of apparent mental distress may need specific professional attention.

As for the reasons leading to a shorter stay in hospital after surgery, patients are usually discharged once the wound has reached a satisfactory stage of healing, as shown by the absence of blood in lavage fluid and of symptoms and signs of infection. Earlier wound healing might have been facilitated by better processing of emotion in both writing and low-alexithymia subjects, buffering the stress due to hospitalization and surgery. An adverse effect of stress on wound healing and surgical recovery was in fact reported in literature (31, 32) and attributed to immune and neuroendocrine factors.

An interesting development of this investigation will be the analysis of the relationship between features of reports produced by subjects with different outcomes and with high vs. low levels of alexithymia (this will be the subject of a subsequent paper). Here we present some quotes from our patients' last writing session, in which they spontaneously described the effects on themselves of the experience of writing (bear in mind that the subjects were unaware of our hypotheses on the possible effects of writing):

- "Today I have little to write, it's as if on the other days I had emptied all my anxiety on the paper. It's a nice feeling, disclosure really helped."
- "It's strange but writing helped since it forced me to stop and think of what was happening, though this thinking increased anxiety. Anyway, I now feel calmer in comparison with other operations I have had, and I'm sure I'll soon be home."
- "Just thinking about it, it came to my mind that this writing exercise was very useful to overcome a difficult moment, which took place on the second day (of writing): this makes me think that good psychological care could be very important also for people like me who are dealing with minor neoplastic forms and may be reasonably optimistic with respect to the continuation of life. If I had received a minimal psychological help when I had an operation 20 years ago, I'd have avoided certain consequences which became manifest after the operation, and that I took months to overcome."

Limitations

The number of subjects was not very high; writing and nonwriting groups, though, were similar on a number of control variables.

Our sample consisted mostly of males: results, therefore, are not automatically applicable to female

samples. We believe this may be particularly true not so much regarding the effect of the technique, which has been documented in the literature in a wide range of samples of both sexes, but regarding the specific interaction with alexithymia.

A similar caveat may be expressed about the nature of distress, which we assume to have been buffered by writing. It is possible that the hypothesized ceiling effect for low alexithymics might be apparent in writing about a situation of moderate distress, such as that undergone by subjects of this study, while it might not be present in writing about more traumatic events, which may be more difficult to process/adjust to/make sense of. Maybe in that case the less alexithymic subjects might make better use of the technique.

We are aware that to ensure the highest possible similarity between writing and nonwriting groups on independent variables, assignment was not perfectly random. At the moment of assignment, though, the investigator had no knowledge of any subject features that were the object of the study (test results, etc), so no systematic bias should be present.

We are also aware that similar studies generally used writing on neutral topics as a control for general contact with investigators. We decided to avoid this procedure because it seemed rather awkward to us to ask people waiting for surgical intervention to write about neutral topics; we also thought that in the specific context it would have been difficult to find really "neutral" topics. What we were asking the experimental group for (a report of their daily life) was something that in other studies could have been considered a "neutral" topic: describing the different objects in the hospital room, for instance, would have been anything but neutral in that condition. We considered, on the other hand, that the notion that a neutral writing task was not efficacious at changing health outcomes was well established by previous studies. Placebo effect in the writing group was also reduced by subjects not being told that writing could be in any way beneficial.

It could also be suggested that differences between the writing and the nonwriting group could be due to resentful demoralization in the control group for being excluded from writing. This effect, though, was minimized by avoiding subjects and controls being in the same hospital room.

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