

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/9081450>

Life satisfaction and active coping style are important predictors of recovery from surgery

Article in *Journal of Psychosomatic Research* · November 2003

DOI: 10.1016/S0022-3999(03)00012-6 · Source: PubMed

CITATIONS

31

READS

103

10 authors, including:



Martin Kopp

University of Innsbruck

134 PUBLICATIONS 1,745 CITATIONS

SEE PROFILE



Wolfgang Söllner

Paracelsus Medical University Nuernberg, ...

177 PUBLICATIONS 1,931 CITATIONS

SEE PROFILE



Bernhard Holzner

Medizinische Universität Innsbruck

176 PUBLICATIONS 2,249 CITATIONS

SEE PROFILE



Hansjoerg Schweigkofler

Psychosomatische Ambulanz Krankenhaus...

17 PUBLICATIONS 421 CITATIONS

SEE PROFILE

Life satisfaction and active coping style are important predictors of recovery from surgery

Martin Kopp^{a,*}, Hugo Bonatti^b, Christina Haller^a, Gerhard Rumpold^c,
Wolfgang Söllner^c, Bernhard Holzner^a, Hansjörg Schweigkofler^a,
Franz Aigner^b, Hartmann Hinterhuber^a, Verena Günther^a

^aConsultation Liaison Service, Department of General Psychiatry, Innsbruck University Hospital, Anichstraße 35, A-6020 Innsbruck, Austria

^bDepartment of Surgery, Innsbruck University Hospital, Anichstraße 35, A-6020 Innsbruck, Austria

^cDepartment of Medical Psychology and Psychotherapy, Innsbruck University Hospital, Anichstraße 35, A-6020 Innsbruck, Austria

Received 25 March 2002; accepted 28 October 2002

Abstract

Objective: The objectives of this study were to investigate the influence of psychological factors on the recovery of surgical patients and to explore whether there are any psychological variables other than anxiety that have a significant influence on recovery from surgery. **Methods:** The participants were 112 adult patients undergoing a variety of surgical procedures. On the day prior to surgery, the Freiburg Personality Questionnaire, the State–Trait Anxiety Inventory, a coping schedule and the Questionnaire of Social Support were used to measure psychological parameters including personality, anxiety, coping and social support. The quality of the surgical outcome was rated by two independent and blinded surgeons by the length of hospital stay and analgesia and sedation requirements. The ratings controlled for the diagnosis, type of operation, intraoperative complications, postoperative medical problems and health limita-

tions independent of the surgical procedure. **Results:** Patients who had a complicated recovery were found to have reduced life satisfaction and lower situation-specific self-control expectations. Structural equation modeling revealed direct relationships between recovery from surgery and personality dimensions with the strongest correlations to life satisfaction, extraversion and attainment orientation. **Conclusion:** The data from this study suggests that valid predictions of the course of postoperative recovery need to take into account personality and coping behaviour orientated data as well as clinical variables. No direct influence on recovery could be predicted from preoperative state anxiety, but it seems likely that state anxiety may influence coping behaviour and that it is this that appears to have a significant impact to surgical recovery.

© 2003 Elsevier Inc. All rights reserved.

Keywords: Surgery; Surgical recovery; Personality; Anxiety; Coping

Introduction

Surgical outcome is generally assessed in terms of objective variables that are easily evaluated such as length of hospital stay and postoperative analgesia requirements. These outcome variables are, however, known to vary considerably between patients undergoing very similar surgical interventions, suggesting that the outcome of surgery is influenced by factors other than the size and location of the incision. Such factors may conceivably interact with

behavioural patterns, and one is reminded of the well-known anecdote among surgeons that it is possible to predict the outcome of surgery just by observation of the demeanour of the patients preoperatively. Such witticisms may not be totally unfounded, however, and when the literature is considered, it is found that research over the last few decades has produced evidence of a relationship between personality and health [1–3]. Personality, in this context, refers to characteristics of an individual that are stable over time and not to transient psychological states. There is also a wealth of literature specifically addressing the relationship between psychological factors and surgical outcome, and there appears to be a consensus of opinion that there is a relationship between psychological factors and outcome of surgery [4–7].

* Corresponding author. Tel.: +43-512-504-3636; fax: +43-512-504-4249.

E-mail address: martin.kopp@uibk.ac.at (M. Kopp).

A literature review revealed that the majority of research concerning psychological factors and surgical outcome focussed on two variables: personality [4,8,9] and state anxiety [10–12]. With regard to state anxiety, it was found that there was a broad, though not unanimous, agreement that this variable was positively associated with incidence of postoperative complications [4]. In a metaanalysis of 27 studies, Munafo and Stevenson [13] concluded that there is a reliable association between preoperative anxiety measures and postoperative mood and pain. However, associations with regard to other recovery variables were found to be less reliable, and, therefore, the existing evidence does not rule out the possibility that the results reflect a consistent bias in self-reporting rather than a causal association.

Data regarding the influence of personality traits on surgical outcome is rather more heterogeneous in character than that describing the effects of state anxiety [4]. Some research has described potentially negative effects of depression or introversion on surgical outcome [4]. Other studies, using psychodynamic assessment, report that problems with sexual satisfaction, perfectionistic body ideals, lack of alexithymia and poor frustration tolerance are predictors of poor postsurgical adjustment in patients after pelvic pouch surgery for ulcerative colitis [8,9]. The influence of social support was described in an interesting work by Kulik and Mahler [14]. It is noted that psychological factors (e.g., extroversion) may influence the quality and quantity of a persons social support network, such that social support is arguably itself influenced by more basic psychological variables. In summary, it would appear that there is enough evidence to surmise that psychological factors probably do influence surgical outcome, but the precise role of psychological factors is still unclear, though it is undoubtedly theoretically and clinically important. As there seems to be a substantial agreement that psychological preparation for surgery is beneficial to patients in terms of outcomes such as negative affect, pain, pain medication, length of stay, behavioural and clinical indices of recovery, physiological indices and satisfaction [15], the relevance of detecting the influence and perhaps the pattern of causal structure between psychological variables and surgical outcome also appears to be worthy of investigation.

In the present study, a number of different psychological parameters were measured preoperatively using participants with varying diagnoses who were undergoing a variety of surgical procedures. The psychological factors used in the study were measures of personality, anxiety, coping and social support, and the recovery variables were postoperative requirements for analgesic and psychopharmacological drugs and length of hospital stay. The study attempted to address two main questions:

1. Are there differences in any psychological dimensions between patients having a recovery with complications and patients having an uneventful recovery?

2. Is it possible to detect a pattern of causal structure between psychological and clinical variables and the surgical recovery?

The present study also attempted to answer a question raised in a recent review about anxiety and surgical recovery [13]; that is, whether there are any psychological variables other than anxiety that deserve greater attention with regard to surgical recovery.

Methods

Subjects

The participants were 112 general surgical patients, who had been treated in the Department of Surgery of the Innsbruck University Hospital. Of these patients, 109 completed the study (58 female, 51 male; mean age 46.2 years, S.D. = 16, range 18–78), with one patient dying following surgery and two patients having their operation cancelled. All the patients were adults undergoing elective surgery under general anaesthesia. Participation in the study was entirely voluntary, and participants were informed in writing of the study objectives before being asked to fill out the questionnaires. Of all the patients approached with regard to participation in the study, only three patients refused (one female, two male). The clinical and sociodemographic characteristics of the participants are shown in Table 1.

Psychometric tests

The revised form of the Freiburg Personality Inventory (FPI-R [16]) was used to evaluate the personality traits of the subjects. The FPI-R is widely used in German-speaking populations, and the revised form of the questionnaire consists of 138 items dedicated to the following 12 subscales: life satisfaction, social orientation, attainment orientation, inhibition, self-control, aggression, stress, physical complaints, health concerns, openness, extraversion and emotionality. All items are answered using a Guttman scale (true/not true); the range of Cronbach's alpha is from .71 to .84 [16].

State anxiety was evaluated using the State-Trait Anxiety Inventory (STAI [17]). The STAI consists of 40 items, half of which require the subject to rate how they generally feel ("I am inclined to take things hard") and the remainder how the subject feels at the moment (e.g., "I feel content."). The latter 20 items were used in this study and were answered using a four-point Likert scale; the range of Cronbach's alpha is from .90 to .94 [17]. The sum of the scores from the 20 items is an index of the psychological construct of "state anxiety".

Social support was evaluated with the short version of the Questionnaire of Social Support (SOZU-K-22 [18]), which is a 22-item self-assessment questionnaire and measures the

Table 1
Sociodemographic and clinical characteristics of the study sample

		Groups	
		Recovery with complications, <i>n</i> = 59	Recovery without complications, <i>n</i> = 50
<i>Sociodemographic variables</i>			
Age	mean (S.D.; min–max)	47 (16.5; 18–75)	45.3 (15.7; 18–78)
Sex	female, % (<i>n</i>)	52.5% (31)	52.3% (27)
	male, % (<i>n</i>)	47.5% (28)	47.7% (23)
<i>Clinical variables, % (n)</i>			
Type of operation ^a	minor (e.g., abscess incision)	1.8% (1)	28% (14)
	moderate (e.g., herniotomy)	23.7% (14)	30% (15)
	intermediate (e.g., cholecystectomy)	50.8% (30)	32% (16)
	major (e.g., gastrectomy)	23.7% (14)	10% (5)
Number of previous operations	mean (S.D.; min–max)	3.02 (2.66; 0–12)	3.32 (2.7; 0–10)
Intraoperative complications	yes	10.2% (6)	2% (1)
	none	89.8% (53)	98% (49)
Postoperative medical problems (i.e. wound bleeding, fever, ...)	yes	6.8% (4)	4% (2)
	none	93.2% (55)	96% (48)
Health limitations independent of surgical procedure	yes	29.3% (17)	26.5% (13)
	none	70.7% (42)	73.5% (37)
Length of stay ^b	normal	74.6% (44)	100% (50)
	increased	25.4% (15)	0% (0)
Consumption of analgetics ^b	normal	40.7% (24)	100% (50)
	increased	59.3% (35)	0% (0)
Consumption of sedatives ^b	normal	27.1% (16)	100% (50)
	increased	72.9% (43)	0% (0)

^a This variable was coded by the contributing surgeon HB using the local hospital guidelines.

^b These variables were coded due to the results of the ratings of the two independent and blinded surgeons.

evidence of emotional and practical support as perceived by the subject. The 22 items are answered on a five-point Likert scale and are combined to generate a score for general social support including emotional and practical support. The range of Cronbach's alpha is from .79 to .92 [18].

In addition to these standardised instruments, the investigators designed a seven-item questionnaire to record some situation-specific coping strategies and behaviour expectancies based on the work of Frey et al. [19] (“I try to get as much information as possible regarding my operation and illness”, “I try to shift my attention away from my operation and illness in different ways”, “I’m planning to follow the advices of physicians and nurses”, “I will try to relax without sedatives after the operation”, “I will try to get by with as little analgesia as possible”, “I regularly talk with my family or friends about my anxieties and concerns”, “My recovery is very dependent upon my will”). Although not a standardised questionnaire with known psychometric properties, it was decided to include the items because of their practical relevance to surgical recovery. All these items were answered using a five-point Likert scale.

Procedure

Preoperative data collection

In the afternoon prior to surgery, a clinical psychologist introduced by the surgical team visited each patient in the

ward. The objectives of the study were explained and, if consent was obtained, the clinical psychologist carried out the psychological tests described above.

Postoperative data collection

Patients recovery from surgery were rated on the basis of information contained in the hospital records and surgical notes by two independent surgeons, who had no knowledge of the rating being carried out by the other. The information given to the two surgeons included the following variables: diagnosis, kind of surgery, length of stay in days (mean = 5.73; S.D. = 4.57; min = 1; max = 31), perioperative surgical and anaesthetic complications, postoperative medical problems (i.e. wound bleeding or fever), postoperative analgesia and sedation requirements (name of the drug, dosage and duration), health limitations independent of surgical procedure, comorbidity and prediction of the recovery process from the discharge letter. The two surgeons were not involved in the treatment procedure and were not informed about the results of the psychosocial questionnaires. The postoperative course of patients with greater than expected analgesic and/or sedative consumption and/or patients with unexplained prolongation of hospitalisation was rated as recovery with complications by the two surgeons. The interrater reliability between the two surgeons was high; 96% of the cases was classified identically (K score = .91). In order to control important variables like

rehospitalisation, further surgical interventions, wound healing problems and so on, the ratings of the surgeons were carried out 2 months after the patient's discharge.

Statistics

In order to calculate significant differences between groups, Mann–Whitney *U* tests and chi-square tests were performed. Following Rothman [20] we tried to keep Type II error as small as possible, and, therefore, no alpha adjustment for multiple comparisons was made.

Additionally, “structural equation modeling” (SEM [21]) was employed to investigate the pattern of causal structure between predicting preoperative variables (severity of surgery, number of earlier operations, health limitations, personality dimensions, state anxiety, coping and social support) with surgical recovery as a dependent variable. The dependent variable surgical recovery was established from the dichotomous variables (expected/ increased) length of stay, analgesia and sedation requirements. “SEM is a statistical methodology that takes a confirmatory (i.e. hypothesis testing) approach to the analysis of a structural theory bearing on a given phenomenon. Typically, this theory represents ‘causal’ processes that generate observations on multiple variables. The term ‘SEM’ conveys two important aspects of the procedure: (a) that the causal processes under study are represented by a series of structural (i.e. regression) equations, and (b) that these structural relations can be modeled graphically to allow a clearer conceptualization of the theory under study. The hypothesized model can then be tested statistically in a simultaneous analysis of the entire system of variables to determine the extent to which it is consistent with the data. If the goodness of fit is adequate, the model argues for the plausibility of postulated relations among variables; if it is inadequate, the tenability of such relations is rejected” [21,p3]. The maximum likelihood method was used to examine the covariance matrices of the items, supplementing the traditional χ^2 goodness-of-fit (GFI) statistic with the comparative fit index (CFI), the nonnormal fit index (NFI) and the root mean square error of approximation (RMSEA). Results were considered significant at a two-sided *P* value < .05.

Results

With regard to question no. 1, Mann–Whitney *U* tests revealed significantly poorer life satisfaction, increased inability to cope without analgesia and sedatives and decreased self-control expectancy in patients with a difficult recovery, *P* < .05 (Table 2).

SEM (Fig. 1) revealed that the strongest relationship with recovery from surgery was with the personality dimension life satisfaction (–.87); this relationship was stronger than severity of surgery (.41) and number of previous operations (–.53). Other relevant influences from personality dimen-

Table 2
Results of psychological questionnaires

Variables	Groups	
	Recovery with complications, <i>n</i> = 59 [mean (S.D.)]	Recovery without complications, <i>n</i> = 50 [mean (S.D.)]
<i>Personality (FPI-R)</i>		
Life satisfaction *	4.7 (1.6)	5.6 (1.7)
Social orientation	5.5 (1.5)	5.4 (1.7)
Attainment orientation	5.1 (1.6)	5.1 (1.7)
Inhibition	5.4 (1.8)	5.5 (1.8)
Self control	5.3 (1.8)	4.9 (2.0)
Aggression	5.2 (1.8)	4.8 (1.8)
Stress	5.0 (1.6)	4.5 (1.9)
Physical complaints	5.1 (1.9)	4.7 (1.9)
Health concerns	5.5 (1.6)	5.4 (2.1)
Openness	5.0 (1.9)	4.7 (2.8)
Extraversion	4.5 (1.8)	4.6 (1.7)
Emotionality	4.9 (1.7)	4.6 (2.0)
<i>Coping</i>		
“I try to get as much information as possible regarding my operation and illness.”	3.5 (1.6)	3.4 (1.4)
“I try to shift my attention away from my operation and illness in different ways.”	3.0 (1.5)	2.9 (1.6)
“I’m planning to follow the advices of physicians and nurses.”	4.4 (0.9)	4.4 (1.1)
“I will try to relax without sedatives after the operation.”	4.2 (1.3)	4.4 (1.0)
“I will try to get by with as little analgesia as possible” *	3.5 (1.4)	4.1 (1.3)
“I regularly talk with my family or friends about my anxieties and concerns.”	3.6 (1.6)	3.8 (1.4)
“My recovery is very dependent upon my will” *	4.2 (1.1)	4.5 (1.0)
<i>State anxiety (STAI)</i>	43.1 (12.5)	40.6 (10.4)
<i>Social support (SOZU-K-22)</i>	4.3 (0.9)	4.3 (0.6)

* *P* < .05.

sions on recovery from surgery were attainment orientation (–.58) and extraversion (.43).

Direct influences to the dependent recovery variable could also be displayed to the following coping relevant items (“I regularly talk with my family or friends about my anxieties and concerns”, “My recovery is very dependent upon my will”, “I try to get as much information as possible regarding my operation and illness”, “I will try to get by with as little analgesia as possible”).

No direct influence to the recovery construct could be detected from the state anxiety dimension, but it seems noteworthy that there was an association between state anxiety and items relevant to coping, with the strongest correlation being to the item “I will try to get by with as little analgesia as possible” (–.76).

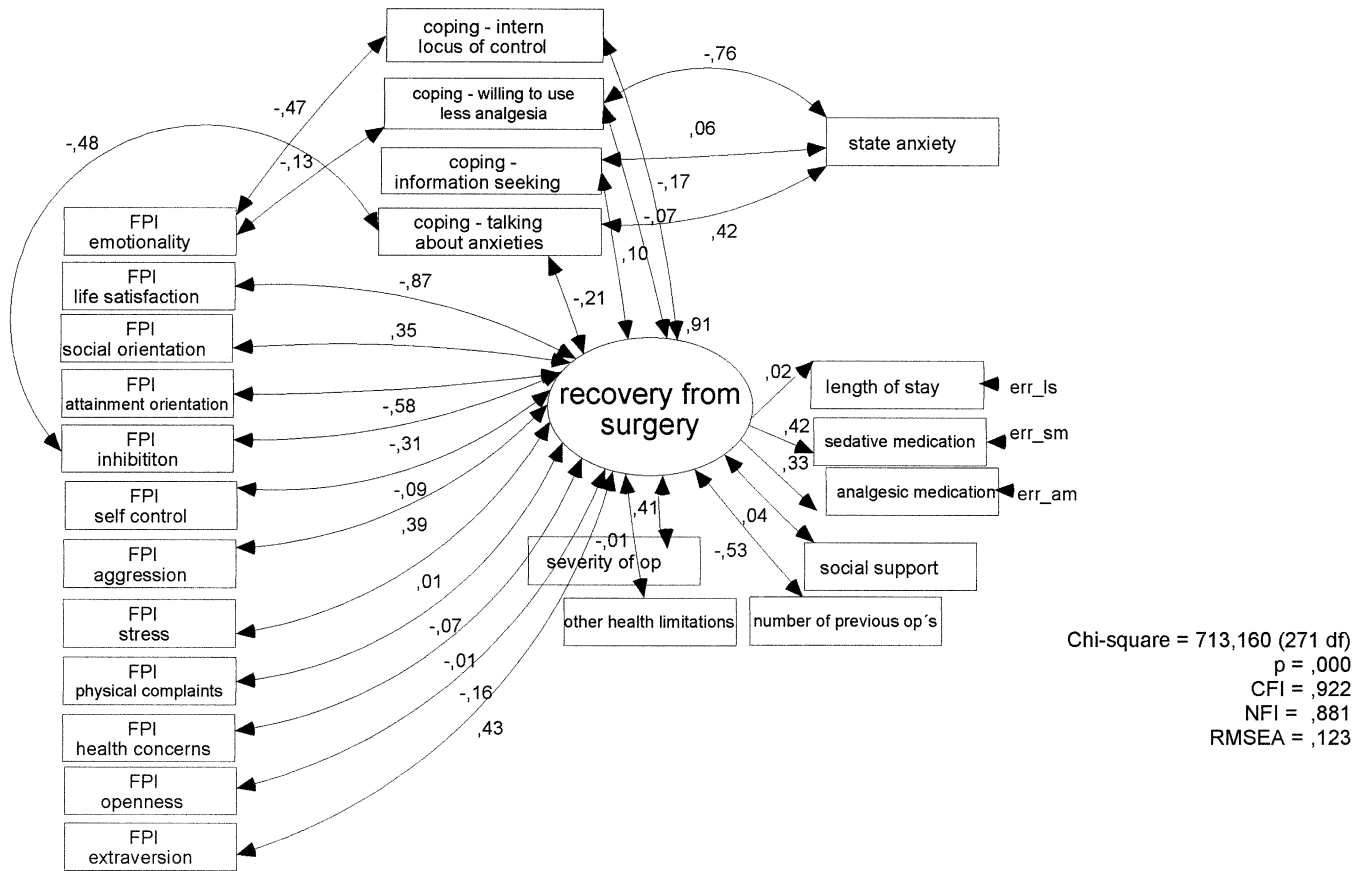


Fig. 1. Model of variables predicting surgical recovery (SEM).

Additionally, our data showed an interesting influence from emotionality to the coping relevant items and specifically to recovery. In our SEM, we found a correlation of $-.47$ between emotionality and the item “My recovery is very dependent upon my will”.

The social support scale showed also a direct relationship to surgical recovery which was significant at the 5% level.

In answering question no. 2, there seems to be a remarkable influence of personality and self-expected coping behaviour on recovery from surgery. Furthermore, self-expected coping behaviour seems to be influenced by both personality and state anxiety.

Discussion

The present study attempted to provide a broad overview of the effects of psychological factors on surgical recovery by assessing the impact of a wide variety of psychological variables, including personality, anxiety state and coping style on patients admitted for general surgery. The use of multivariate analysis allowed the formation of a model of recovery from surgery by means of a SEM. While logistic regression analyses result in seemingly independent predictor variables, SEM allows for the detection of mutual

interactions between predictor variables and their relationship to the target variable.

To increase the goodness of fit of the SEM, recovery from surgery in general—91% of the variance of which could be explained—was chosen as a target variable. This satisfactory result permits the conclusion that the course of events postoperatively is influenced by psychological variables in addition to physical and sociodemographic parameters.

The background personality and actual preoperative coping resources of patients were found to be predictors of surgical recovery rated by postoperative analgesia and sedation requirements and length of hospital stay. Previous studies have described the influence of preoperative psychological condition on mood or quality of life [8,9], but our data suggests that the psychological characteristics of surgical patients also have a marked influence on the clinical outcome parameters commonly used by surgeons. It is noted that in reporting these results our study avoided the potential confounds of individual differences in age, disease process and type of surgery by asking each surgeon to rate each patient individually, taking into consideration all aspects of the disease and the course of treatment.

One limitation of the study arises from the use of participants who had undergone a variety of surgical

procedures such that the results might reflect the bias in the selection of the sample. Such an argument, however, would not take into account the fact that the outcome ratings were compiled by two independent and experienced surgeons who were aware of individual patients' diagnoses when they made their judgements about postoperative outcome. Furthermore, in practical terms, it would seem that as C-L services are frequently confronted with patients undergoing a wide variety of surgical procedures the use of a heterogeneous patient cohort is entirely reasonable if general characteristics influencing the postoperative course of surgical patients are to be discovered.

At present, it is unclear why life satisfaction and the "treatment-oriented" coping style are stronger predictors for the postoperative outcome than anxiety as documented in earlier studies [10,11]. Perhaps the inclusion of different psychological variables generates a shift of the results due to an interaction of different constructs. Fig. 1 shows interactions between emotionality and factors relevant to coping and also interactions between state anxiety and factors relevant to coping. If previous analysis by Mathews and Ridgeway [4] is considered and it is kept in mind that emotionality is described as a construct close to Eysenck and Eysenck's [22] neuroticism, these results might be explained in terms of the fact that both state anxiety and emotionality are closely linked with behaviour relevant to coping specific patterns.

The study of the dimension "life satisfaction" in the used Freiburg Personality Questionnaire suggests that a high degree of life satisfaction is associated with an optimistic view of the world in comparison to the pessimistic views held by people with a low level of life satisfaction. This suggests that the construct of life satisfaction of the FPI-R scale used in the present study is corresponding with the construct of dispositional optimism. If life satisfaction is regarded in this way our results seem to be comparable with the results of studies that have investigated the relationship between scores on the life orientation test (LOT) and the outcome of cardiac surgery [23,24]. Scheier et al. [23,24] have shown that dispositional optimism is a predictor of coping efforts and of surgical outcome, and, more specifically, dispositional optimism (assessed prior to surgery) correlated positively with manifestations of problem-focused coping and negatively with the use of denial.

Furthermore, the results from the univariate analysis with regard to the preoperative coping questions (Table 2) also seem to be noteworthy. Being convinced of playing an important role in the recovery process and having the aim of using as little analgesia as possible seem to be predictors of an uneventful recovery. This finding is consistent with the work of Scheier et al. [23,24], who have found a correlation between active coping style and higher life satisfaction.

On the basis of our results, it is our opinion that future research could usefully address the following two questions: (1) Can the results of the present study be replicated in

homogenous patient groups—i.e. patients with the same diagnosis undergoing the same surgical procedure? (2) Are there different effects of psychological preparation programmes before surgery between patients who differ in life satisfaction and/or coping style in comparison to previous studies [15,25]?

Acknowledgments

This work was supported by grant no. 4707 of the Austrian National Bank.

References

- [1] Scheier MF, Bridges MW. Person variables and health: personality predispositions and acute psychological states as shared determinants of disease. *Psychosom Med* 1995;57:255–68.
- [2] Egbert LD, Battit GE, Welch CE, Bartlett MK. Reduction of postoperative pain by encouragement and instruction of patients. A study of doctor–patient rapport. *N Engl J Med* 1964;270:823–7.
- [3] Linn BS, Linn MW, Klimas NC. Effects of the psychophysical stress on surgical outcome. *Psychosom Med* 1988;50:240–4.
- [4] Mathews A, Ridgeway V. Personality and surgical recovery: a review. *Br J Clin Psychol* 1981;20:243–60.
- [5] Voulgari A, Lykouras L, Papanikolaou M, Tzonou A, Danou Roussaki A, Christodoulou G. Influence of psychological and clinical factors on postoperative pain and narcotic consumption. *Psychother Psychosom* 1991;55:191–6.
- [6] Taenzer P, Melzack R, Jeans ME. Influence of psychological factors on postoperative pain, mood and analgesic requirements. *Pain* 1986; 24:331–42.
- [7] Cohen F, Lazarus RS. Active coping processes, coping dispositions and recovery from surgery. *Psychosom Med* 1973;35:375–89.
- [8] Weinryb RM, Gustavsson JP, Barber JB. Personality predictors of dimensions of psychosocial adjustment after surgery. *Psychosom Med* 1997;59:626–31.
- [9] Weinryb RM, Rössel R. Personality traits that can affect adaptation after colectomy. *Psychother Psychosom* 1986;45:57–65.
- [10] Johnston M, Carpenter L. Relationship between preoperative anxiety and postoperative state. *Psychol Med* 1980;10:361–7.
- [11] Lucente FE, Fleck S. A study of hospitalization anxiety in 408 medical and surgical patients. *Psychosom Med* 1972;34:304–12.
- [12] Kain ZN, Sevarino F, Alexander GM, Pincus S, Mayes LC. Preoperative anxiety and postoperative pain in women undergoing hysterectomy. A repeated measure design. *J Psychosom Res* 2000;49: 417–22.
- [13] Munafò RM, Stevenson J. Anxiety and surgical recovery. Reinterpreting the literature. *J Psychosom Res* 2001;51:589–96.
- [14] Kulik JA, Mahler HIM. Effects of preoperative room-mate assignment on preoperative anxiety and recovery from coronary bypass surgery. *Health Psychol* 1987;6:525–43.
- [15] Johnston M, Vögele C. Benefits of preparation for surgery: a meta-analysis. *Ann Behav Med* 1993;15(4):245–56.
- [16] Fahrenberg J, Hampel R, Selg H. Das Freiburger Persönlichkeitsinventar: 5. ergänzte Auflage. Göttingen: Hogrefe, 1989.
- [17] Spielberger CD, Gorsuch RL, Lushene RE. Manual for the State–Trait Anxiety Inventory. Palo Alto: Consulting Psychologists Press, 1970.
- [18] Sommer E, Fydrich H. Fragebogen zur Sozialen Unterstützung. Berlin: DGVT, 1989.
- [19] Frey D, Havemann D, Rogner O. Kognitive und psychosoziale Determinanten des Genesungsprozesses von Unfallpatienten. Kiel: Unveröffentlichter Abschlussbericht, 1983.

- [20] Rothman KJ. [No adjustments are needed for multiple comparisons. Epidemiology 1990;1:43–6.](#)
- [21] Byrne BM. [Structural equation modeling with AMOS. Mahwah, NJ: Lawrence Erlbaum Associates, 2001.](#)
- [22] Eysenck HJ, Eysenck SGB. [Manual of the Eysenck Personality Inventory. London: Univ. of London Press, 1964.](#)
- [23] Scheier MF, Magovern GJ, Abott RN, Owens JF, Lefebvre RC, Carver CS. [Dispositional optimism and recovery from coronary bypass surgery: the beneficial effects on physical and psychological well-being. J Pers Soc Psychol 1989;57:1024–40.](#)
- [24] Scheier MF, Mathews KA, Owens JF, Schulz R, Bridges MW, Magovern GJ, Carver CS. [Optimism and rehospitalization after coronary artery bypass graft surgery. Arch Intern Med 1999;26:829–35.](#)
- [25] Devine EC. [Effects of psychoeducational care for adult surgical patients: a meta-analysis of 191 studies. Patient Educ Couns 1992;19:129–42.](#)