

Doctor-dependent changes in complaint-related cognitions and anxiety during medical consultations in functional abdominal complaints

A. M. VAN DULMEN,¹ J. F. M. FENNIS, H. G. A. MOKKINK, H. G. M. VAN DER VELDEN
AND G. BLEIJENBERG

From the Department of General Practice and Social Medicine, University of Nijmegen, Department of Internal Medicine and Department of Medical Psychology, University Hospital Nijmegen, The Netherlands

SYNOPSIS This study explored the changes in complaint-related cognitions and anxiety of 110 consecutive out-patients with functional abdominal complaints (irritable bowel syndrome), during a series of consultations. Patients' anxiety, fear of cancer, somatic attribution concerning intestines or stomach and catastrophizing cognitions appeared to diminish significantly during the consulting period. Positive changes in patients' psychological attribution and somatic attribution appeared to be related to doctors' correct perceptions of these attributions. Catastrophizing cognitions diminished significantly more when patients saw the same doctor throughout the consultations. As changes in attributions and catastrophizing cognitions appeared to be related to doctor-patient interaction, it is conceivable that doctors could learn to influence cognitions even more.

INTRODUCTION

Functional abdominal complaints, otherwise known as irritable bowel syndrome, have a high prevalence (Talley *et al.* 1991; Jones & Lydeard, 1992), conventional treatments, such as medication and dietary advice, are of limited value (Klein, 1988) and the prognosis for these complaints is poor (Bleijenberg & Fennis, 1989; Fowle *et al.* 1992). However, complaint-related cognitions and anxiety are known to have predictive value for the course of functional abdominal complaints (Bleijenberg & Fennis, 1989; Fowle *et al.* 1992). Therefore, it can be hypothesized, that changing unhelpful cognitions into prognostically more favourable ones will improve outcome. If this is true and if doctors are able to assist their patients in such changes, this could be an effective principle in the treatment of functional abdominal complaints. Indeed, in patients with chronic pain, a reduction of anxiety and catastrophizing cognitions or an increase of self-efficacy beliefs

could be related to a better outcome (Boston *et al.* 1990; Kores *et al.* 1990; Gaskin *et al.* 1992; Turk & Rudy, 1992). However, in functional abdominal complaints such data are lacking. It is even unknown if changes of this kind happen at all during medical consultations. Moreover, it is unknown if such changes have any relation with doctor- or consultation-dependent factors. Furthermore, it would be important to know if any doctor- or consultation-dependent factors are accessible to modification and if they can be applied intentionally in the treatment of patients. Finally, it will be essential to know if achieved changes in non-somatic complaint dimensions are relevant to the course of the complaints.

In this paper we confine ourselves to the changes in complaint-related cognitions and anxiety that take place in patients with functional abdominal complaints during a series of medical consultations. In particular, the relations between these changes and doctor- or consultation-characteristics are highlighted. Also, attention is paid to factors responsible for the satisfaction experienced by the patient.

Specifically, the following questions were formulated. Do the complaint-related cognitions and anxiety of patients with functional ab-

¹ Address for correspondence: A. M. van Dulmen, Department of General Practice and Social Medicine, 229 HSV, PO Box 9101, 6500 HB Nijmegen, The Netherlands.

dominal complaints change during a series of medical consultations? Which is the direction of these changes? Is there any evidence that the changes are related to doctor- or consultation-dependent factors, such as doctors' perceptions of non-somatic complaint dimensions, seeing the same doctor throughout the consultations, sex-(a)symmetry in doctor-patient interactions, the number of consultations, and the extensiveness of the physical examination? Which factors contribute to patient satisfaction?

METHOD

Subjects and procedures

One hundred and thirty-four consecutive patients with abdominal pain referred by their general practitioners to the out-patient clinic for internal medicine between March 1991 and April 1992 were asked to participate in this study. All patients had to meet the entry criteria of initial referral and had to be able to read and understand Dutch. They also had to be between 15 and 65 years old. They were asked to fill in a questionnaire prior to the first consultation. None of the patients refused to participate in the study.

After verification by two independent internists, 120 patients were diagnosed as suffering from functional abdominal pain. The remainder of this paper relates only to this functional group. One hundred and ten patients, 66 women and 44 men, completed questionnaires after each follow-up consultation. The drop-outs consisted of three patients who did not make another appointment, one patient who was admitted to hospital, and six patients who refused further cooperation after the first consultation. No differences were found in complaint-related cognitions, behaviour, and anxiety, or in any other complaint or patient characteristics between examined patients and drop-outs.

Immediately after each consultation, doctors completed a questionnaire with questions identical to those answered by patients. They had to answer each question according to the way that they thought the patient had answered it. Thirteen doctors participated, six women and seven men, with mean ages of 30 (s.d. 1.5) and 39 (s.d. 7) years ($P = 0.003$), respectively. All female

doctors and four male doctors were (senior) registrars in internal medicine. The other three male doctors were consulting internists.

For the purpose of this study, the following definitions were used: 'doctor-patient similarity' refers to the percentage doctor-patient contacts in which doctors and patients answered a question in the same way; 'consulting period' refers to the period between first and last consultation; the 'last consultation' is the consultation in which the final diagnosis, namely 'no organic explanation', was told to the patient; 'continuity in doctor-patient contacts' means consulting the same doctor throughout the consultations. 'Sex-symmetric consultations' are defined as consultations with a female doctor and a female patient or a male doctor and a male patient. 'Sex-asymmetric consultations' are defined as consultations in which doctor's and patient's sex differed.

Ratings

Before the first and after each follow-up consultation, patients' complaint-related cognitions and anxiety were measured by means of the following instruments. For the purpose of measuring doctor-patient similarity, these variables were dichotomized later.

State anxiety

This was measured using the shortened 10-item version of the Spielberger State Anxiety Inventory (Spielberger *et al.* 1970) (alpha coefficient 0.85). Scores on each item ranged from: (1) not at all; to (2) somewhat; to (3) moderately so; to (4) very much so. A sumscore equal to or above 21 reflects an increased level of anxiety. This standard score was based on the results of a previous study on patients with functional abdominal complaints (Bleijenberg & Fennis, 1989), as well as on normative data from the manual.

Attributions

The nine questions regarding pain attributions (Michela & Wood, 1986) were derived from an earlier investigation (Bleijenberg & Fennis, 1989) in which patients were asked to write down their ideas about what caused the abdominal pain. The scores on each of the nine attributions

Table 1. Item content and factor loadings for the 9 selected Pain Cognition List items for each factor

Item content	Factor 1: 'Self-efficacy'	Factor 2: 'Catastrophizing'
I think psychological factors have something to do with my pain too	0.67	
Through my attitude I am able to cope with my pain	0.50	
When I am doing something intensely, I can forget my pain for a great deal	0.56	
I think I can influence my pain positively	0.78	
Relaxation exercises diminish the pain	0.75	
My thoughts are continuously concentrated on the pain		0.72
It seems as if the pain is becoming more and more prominent		0.79
I often think: 'Why must this happen to me?'		0.69
I feel powerless regarding my pain		0.65

ranged from: (1) total disagreement; to (5) total agreement. Four items were excluded from analysis because of their low frequencies. Three psychological and two somatic attributions remained (Robbins & Kirmayer, 1991) (Table 2). A dichotomy was obtained by joining the scores 'total agreement' and 'agreement' *versus* the scores 'total disagreement', 'disagreement', and 'I don't know'.

Pain-related cognitions

These were investigated using the Dutch Pain Cognition List (Vlaeyen *et al.* 1990). For the purpose of our study, nine items were selected. Factor analysis revealed two underlying factors (Table 1). These were interpreted as self-efficacy cognitions (five items, alpha coefficient 0.68), and catastrophizing cognitions (four items, alpha coefficient 0.71). Scores on each item ranged from: (1) total disagreement; to (5) total agreement. The self-efficacy and catastrophizing sumscores were dichotomized according to comparable normative data (Vlaeyen *et al.* 1990). A score ≥ 16 on the self-efficacy scale reflects a strong belief in the ability to control the pain, whereas a score ≥ 12 on the catastrophizing scale reflects catastrophizing thoughts about the pain.

After each consultation the satisfaction with the visits to the doctor was measured.

The satisfaction scale

This consisted of four questions to which patients could respond on a 5-point Likert-scale

with 'certainly not' and 'certainly' marking the endpoints. These four questions were: 'Did you feel comfortable while visiting the doctor?'; 'Did the doctor give you opportunity to express yourself?'; 'Did the doctor give you clear information?'; and 'Did the doctor take his time to talk with you?'. The sumscore (range 4-20) reflects patients' level of satisfaction (alpha coefficient 0.87, mean 16.19, s.d. 2.88).

Diagnostic tests and investigations

After the final consultation, for each patient the number of the following diagnostic tests and investigations, which were carried out between consecutive consultations and were related directly to the abdominal complaints was counted: blood-, urine- and faeces-tests, endoscopy and colonoscopy, X-rays, and ultra-sound scans (median 4, minimum 0, maximum 8).

Statistical analysis

The Wilcoxon matched-pairs signed-ranks test was used for investigating changes in cognitions and anxiety during the consulting period. The percentages of doctor-patient similarity were used to measure whether doctors perceived patients' cognitions and anxiety correctly, or not. To determine these percentages, scores on cognitions and anxiety, which were measured before the first and after each following consultation, were dichotomized according to the criteria mentioned above. When doctors' and patients' scores were identical, doctor-patient similarity was said to be present. For each patient a change score was calculated by

subtracting scores on cognitions and anxiety after the last consultation from scores before the first consultation. Using these change scores, it was possible to examine the differences in changes between subgroups of patients, defined by either doctor-patient similarity, the continuity in doctor-patient contacts, patients' and doctors' sex, the number of consultations, or the number of diagnostic tests and investigations (dichotomized at the median). These differences were tested using the Mann-Whitney *U* test. Statistical significance for all tests was set at the 5% level.

RESULTS

Number of consultations

Seventy-one of the examined patients visited the doctor at the out-patient clinic twice, 30 patients three times and nine patients four times. In the present study, patients with three and four consultations were joined, because the number of patients with four consultations ($N = 9$) was too small to analyse separately. The period between first and last consultation had a mean duration of 40 days (S.D.25).

Changes in complaint-related cognitions and anxiety

The mean scores on cognitions and anxiety before the first and after the last consultation are presented in Table 2. State anxiety, fear of

cancer, somatic attributions concerning the intestines or stomach and catastrophizing cognitions diminished significantly between first and last consultation. No significant changes were found in the remaining cognitions.

Doctor- and consultation-dependent factors related to changes in cognitions and anxiety

The relationships between changes in cognitions and anxiety and each of the following factors were investigated.

Doctor-patient similarity

The somatic attribution concerning the intestines or stomach appeared to diminish significantly more ($P < 0.001$) in patients whose doctors perceived these attributions correctly at first consultation ($N = 71$) than in patients whose doctors did not perceive these attributions correctly ($N = 35$). Furthermore, the psychological attribution concerning an agitated and busy life appeared to increase significantly more ($P = 0.04$) in patients whose doctors perceived these attributions correctly at first consultation ($N = 88$) than in patients whose doctors did not perceive these attributions correctly ($N = 18$).

Continuity in doctor-patient contacts

Catastrophizing cognitions of patients who visited the same doctor throughout the consultations ($N = 90$), appeared to diminish significantly more ($P = 0.009$) than catastrophizing

Table 2. Means and standard deviations (S.D.) on anxiety and cognitions before the first and after the final consultation ($N = 110$) and level of significance of the differences between first and final consultation (Wilcoxon matched-pairs signed-ranks test)

Variable (range)	First cons. Mean (S.D.)	Final cons. Mean (S.D.)	<i>P</i>
State anxiety (10-40)	20.51 (5.59)	18.93 (5.60)	0.01
Psychological attributions (1-5)			
The abdominal pain has something to do with my agitated or busy life	2.25 (1.15)	2.19 (1.15)	0.54
The abdominal pain is a consequence of problems or stress	2.35 (0.99)	2.52 (1.16)	0.10
I am afraid I might have cancer	2.21 (1.07)	1.81 (0.93)	< 0.001
Somatic attributions (1-5)			
The abdominal pain has something to do with my intestines, stomach, gall or urinary tracts	3.82 (0.87)	3.08 (1.09)	< 0.001
The abdominal pain is a result of not being able to have stools	2.04 (1.23)	1.94 (1.22)	0.28
Catastrophizing (4-20)	10.72 (3.67)	10.02 (3.53)	0.008
Self-efficacy (5-25)	14.38 (3.78)	14.68 (4.07)	0.13

cognitions of patients who did not visit the same doctor throughout the consultations ($N = 20$). Both groups of patients did not differ significantly in initial scores on catastrophizing cognitions.

Sex (a)symmetry in doctor-patient contacts

The self-efficacy score did appear to increase significantly more ($P = 0.03$) in sex-asymmetric consultations than in sex-symmetric consultations. However, initial scores on the self-efficacy scale appeared to be significantly higher ($P = 0.01$) in sex-symmetric consultations than in sex-asymmetric consultations.

Number of consultations and diagnostic tests

The number of consultations and the number of diagnostic tests and investigations did not appear to be related to changes in cognitions and anxiety.

Patients' satisfaction

Patients whose anxiety diminished ($N = 59$) were significantly more ($P = 0.02$) satisfied with the visits to the doctor than patients whose anxiety did not diminish ($N = 49$). Satisfaction with the visits to the doctor appeared neither to be related to the number of consultations nor to the number of diagnostic tests and investigations. Patients consulting the same doctor throughout the consultations were significantly more ($P = 0.05$) satisfied with the consultations than patients who visited different doctors.

DISCUSSION

The present study revealed that the level of anxiety, fear of cancer, somatic attribution concerning the intestines or stomach and catastrophizing cognitions of patients with functional abdominal complaints diminished significantly during the consulting period at an out-patient clinic. This is an interesting finding, because it is well-known that the above mentioned variables influence the course of functional abdominal complaints (Bleijenbergh & Fennis, 1989; Fennis *et al.* 1990; Fowlie *et al.* 1992). Theoretically, reductions of anxiety, fear of cancer, somatic attributions and catastrophizing cognitions could, therefore, lead to a better outcome. These

favourable changes were achieved without doctors deliberately trying to influence patients' anxiety and cognitions. After all, medical consultations are not aimed at behaviour modification. However, there are indications that the changes are related to doctor-patient interactions, as was shown previously within the general practitioners' consultations (Kar van de, 1992). This is important because it would mean that doctors could possibly learn to influence cognitions purposefully.

Doctors' correct perception of the somatic attributions concerning the intestines or stomach appeared to be related to a reduction of these attributions. Correct perception of the attribution concerning an agitated and busy life appeared to be related to an increase of this attribution. Of course the changes in both attributions may be merely the result of the physical examination that has taken place. However, the number of diagnostic investigations did not appear to be related to the mentioned changes. This may indicate that doctors are able to contribute to prognostically favourable changes in complaint-related cognitions and that they may be able to learn to use their influence intentionally. After all, as far as the skill of perception of patients' cognitions and anxiety is concerned, there is much room for improvement (Dulmen van *et al.* 1994).

It may seem inconsistent that changes in cognitions and anxiety, apart from patients' attributions, did not appear to be related to doctor-patient similarity. Yet, this might be explained by the fact that the mean percentage doctor-patient similarity with respect to attributions was significantly higher than with respect to pain cognitions and anxiety, namely 77 and 55%, respectively (Dulmen van *et al.* 1994).

Besides doctor-patient similarity, continuity in doctor-patient contacts appeared to be related to changes in patients way of thinking too, for catastrophizing cognitions of patients who met the same doctor throughout the consultations reduced more than those of patients who did not see the same doctor throughout the consultations. Moreover, continuity in doctor-patient contacts appeared to increase satisfaction, as was also shown in another study (Hammerström, 1993). These findings stress the importance of continuity in doctor-patient interactions. Offer-

ing the patient the same doctor during the entire consulting period is not just a common courtesy, but in fact an important therapeutic condition.

Apart from the above mentioned findings related to doctors' perceptions and to the continuity in doctor-patient contacts, this study revealed some interesting aspects about patients' satisfaction with the consultations. As already mentioned and contrary to expectations, it appeared that patients did not become more satisfied when doctors carried out more diagnostic investigations or when patients visited the doctor more often. The quality and style of communication might prove to be far more important for patients' satisfaction, as has also emerged in previous studies (Stewart, 1984; Klein Buller & Buller, 1987; Bensing, 1991; Bertakis *et al.* 1991).

Our finding that self-efficacy scores increased more in sex-asymmetric consultations seems difficult to explain at first sight. However, this difference can be explained by the fact that the initial self-efficacy scores of patients who would be ending up in sex-symmetric consultations were already higher than the initial scores of patients with sex-asymmetric consultations.

Some methodological issues of this study are worth mentioning. The most important one is that we do not know what has actually happened during the consultations. Our findings indicate that medical consultations contribute to the correction of prognostically unhelpful complaint-related cognitions. Yet, our interpretations remain speculative until further research on the content and process of doctor-patient interaction will confirm them.

It may be wondered whether all doctors gave their patients the same explanations for the complaints. The out-patient clinic for internal medicine in which this research was done has a fairly standard procedure with regard to patients with functional abdominal complaints: explanation and reassurance with respect to the unknown, in any case, non-somatic cause of the complaints. In extreme cases, patients with relapsing complaints can be referred to a behavioural therapist, from whom they will learn to cope with the complaints (Fennis *et al.* 1990). The diagnosis irritable bowel syndrome (IBS) is being avoided, because this term incorrectly supposes the existence of some somatic pathology with clearly definable symp-

toms and, as a consequence, strengthens unfavourable somatic attributions. Yet, we believe that our definition of functional abdominal complaints corresponds to the broad definition of IBS. IBS is also defined more restrictively using the criteria formulated by Manning (Manning *et al.* 1978; Whitehead *et al.* 1988; Drossman *et al.* 1990). Our research finding would not have been different if we had defined IBS more restrictively, because analysis *post hoc* did not show significant differences in changes in anxiety or cognitions between restrictive IBS patients and other patients.

One of our psychological attributions concerned the fear of cancer. This might seem to be a somatic attribution. Yet, factor analysis on the five attributions showed that the three psychological attributions are grouped together in one factor, including fear of cancer, while the other two somatic attributions, could be grouped in another factor. Therefore, we consider the cancer attribution to be a psychological attribution thereby implying that the emphasis in the attribution is the fear rather than the disease. Moreover, as we examined each causal attribution separately rather than an attribution style, categorization has no implications for the results in this study.

As our data were ordinal, we used non-parametric tests to investigate changes in cognitions and anxiety. In line of these non-parametric tests it would seem to be more appropriate to present medians and ranges rather than means and standard deviation. However, medians are not informative, especially not in variables with a restricted number of answering categories. Differences between two measurements may appear to be significant while their medians do not differ. Furthermore, as the frequency distributions of our observations are symmetrical, the means and medians coincide. Therefore, we believe that it is customary and most correct to investigate change in ordinal data by means of a non-parametric test such as the Wilcoxon matched-pairs signed ranks test and show means and standard deviations as illustrations or indicators of the observed differences rather than proofs.

One might assume that the mutual relation between independent variables contributed to changes in cognitions or anxiety. We examined the possibility of confounding using logis-

regression analysis with either a reduction of negative cognitions (or not) or an increase of positive cognitions (or not) as dependent variable. As not a single combination of independent variables appeared to be related to changes in patients' cognitions, confounding did not appear to have distorted the relationships we found between changes in cognitions and doctor- and consultation-dependent variables.

Finally, to keep the questionnaire as short as possible, details of the abdominal complaints (severity and frequency) and patients' secondary complaints, which were measured prior to the first consultation (Dulmen van *et al.* 1994), were not measured after follow-up consultations. Therefore, it was impossible to examine the relationship between changes in cognitions and possible changes in these factors. However, we assume that abdominal and secondary complaints have diminished too. This assumption is based on the fact that some cognitions have predictive value for the course of the complaints (Bleijenbergh & Fennis, 1989; Fowle *et al.* 1992). These are precisely the cognitions that improved within this study. By measuring the abdominal and secondary complaints again 6 months after the patients' first visit to the out-patient clinic, we will know whether the complaints have improved too.

The impact of our finding that doctors contribute to changes in patients' cognitions and anxiety is considerable. Before the first consultation, unhelpful somatic attributions and catastrophizing cognitions existed in, respectively, 66 and 44% of patients with functional abdominal complaints (Dulmen van *et al.* 1994). Standard medical treatment led to an amelioration, but undesirable cognitions continue to exist in one-third of the patients. We feel that more patients would benefit if doctors would systematically consider patients' anxiety, somatic attributions and catastrophizing cognitions through a patient-centred approach (Henbest & Stewart, 1990). Recently, a special course in this direction has been developed at our University Hospital, comparable with a training developed previously (Christensen & Levinson, 1988). We intend to evaluate the effects of this course on the quality of the doctor-patient interaction as soon as a substantial number of doctors has completed the course.

This study was funded by the Centre for Women's Studies, University of Nijmegen, The Netherlands.

REFERENCES

- Bensing, J. (1991). Doctor-patient communication and the quality of care. *Social Science and Medicine* 32, 1301-1310.
- Bertakis, K. D., Roter, D. & Putnam, S. M. (1991). The relationship of physician medical interview style to patient satisfaction. *Journal of Family Practice* 32, 175-181.
- Bleijenbergh, G. & Fennis, J. F. M. (1989). Anamnestic and psychological features in diagnosis and prognosis of functional abdominal complaints: a prospective study. *Gut* 30, 1076-1081.
- Boston, K., Pearce, S. A. & Richardson, P. H. (1990). The pain cognitions questionnaire. *Journal of Psychosomatic Research* 34, 103-109.
- Christensen, J. & Levinson, W. (1988). Implementing a behavioural medicine program in an internal medicine residency: a description of curriculum content, resources and barriers encountered. *Psychology and Health* 2, 349-365.
- Drossman, D. A., Thompson, W. G., Talley, N. J., Funch-Jensen, P., Janssens, J. & Whitehead, W. E. (1990). Identification of subgroups of functional gastrointestinal disorders. *Gastroenterology International* 3, 159-172.
- Dulmen van, A. M., Fennis, J. F. M., Mokkink, H. G. A., Velden van der, H. G. M. & Bleijenbergh, G. (1994). Doctors' perception of patients' cognitions and complaints in irritable bowel syndrome at an out-patient clinic. *Journal of Psychosomatic Research* 38, 581-590.
- Fennis, J. F. M., Bleijenbergh, G. & Hermans-van Wordragen, R. (1990). Psychologic factors in diagnosis, prognosis, and treatment of functional abdominal complaints. *Scandinavian Journal of Gastroenterology* 25 (suppl 178), 13-16.
- Fowle, S., Eastwood, M. A. & Ford, M. J. (1992). Irritable bowel syndrome: the influence of psychological factors on the symptom complex. *Journal of Psychosomatic Research* 36, 169-173.
- Gaskin, M. E., Greene, A. F., Robinson, M. E. & Geisser, M. E. (1992). Negative affect and the experience of chronic pain. *Journal of Psychosomatic Research* 36, 707-713.
- Hammerström, J. (1993). Patients' experiences with a hospital outpatient clinic. Is lack of continuity in the physician-patient relationship an important quality problem? *Tidsskrift for Nordisk Lægeforen* 113, 1600-1602.
- Henbest, R. J. & Stewart, M. A. (1990). Patient-centredness in the consultation. 2. Does it really make a difference? *Family Practice* 7, 28-33.
- Jones, R. & Lydeard, S. (1992). Irritable bowel syndrome in the general population. *British Medical Journal* 304, 87-90.
- Kar, A. van de (1992). Determinants of Consulting the General Practitioner. Dissertation Maastricht University, Maastricht, The Netherlands.
- Klein, K. B. (1988). Controlled treatment trials in the irritable bowel syndrome: a critique. *Gastroenterology* 95, 232-241.
- Klein Buller, M. & Buller, D. B. (1987). Physicians' communication style and patient satisfaction. *Journal of Health and Social Behavior* 28, 375-388.
- Kores, R. C., Murphy, W. D., Rosenthal, T. L., Elias, D. B. & North, W. C. (1990). Predicting outcome of chronic pain treatment via a modified self-efficacy scale. *Behaviour Research and Therapy* 28, 165-169.
- Manning, A. P., Thompson, W. G., Heaton, K. W. & Morris, A. F. (1978). Towards positive diagnosis of the irritable bowel syndrome. *British Medical Journal* i, 653-654.
- Michela, J. L. & Wood, J. V. (1986). Causal attributions in health and illness. In *Advances in Cognitive-Behavioral Research and Therapy* (ed. P. C. Kendall), pp. 179-235. Academic Press Inc: New York.

- Robbins, J. M. & Kirmayer, L. J. (1991). Attributions of common somatic symptoms. *Psychological Medicine* **21**, 1029-1045.
- Spielberger, C. D., Gorsuch, R. L. & Lushene, R. E. (1970). *STAI Manual for the State-Trait Anxiety Inventory*. Consulting Psychologists Press: Palo Alto, California.
- Stewart, M. A. (1984). What is a successful doctor-patient interview? A study of interactions and outcomes. *Social Science and Medicine* **19**, 167-175.
- Talley, N. J., Zinsmeister, A. R., Van Dyke, C. & Melton, L. J. (1991). Epidemiology of colonic symptoms and the irritable bowel syndrome. *Gastroenterology* **101**, 927-934.
- Turk, D. C. & Rudy, E. R. (1992). Cognitive factors and persistent pain; a glimpse into Pandora's box. *Cognitive Therapy and Research* **16**, 99-122.
- Vlaeyen, J. W. S., Geurts, S. M., Kole-Snijders, A. M. J., Schuerman, J. A., Groenman, N. H. & van Eek, H. (1990). What do chronic pain patients think of their pain? Towards a pain cognition questionnaire. *British Journal of Clinical Psychology* **29**, 383-394.
- Whitehead, W. E., Bosmajian, L., Zonderman, A. B., Costa, P. T. & Schuster, M. M. (1988). Symptoms of psychologic distress associated with irritable bowel syndrome. *Gastroenterology* **95**, 709-714.