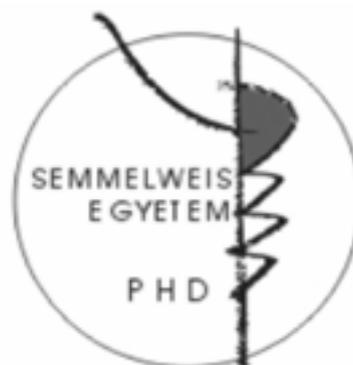


# Psychometric evaluation of gastrointestinal disorders. Contrasting functional and organic disorders

Summary of thesis

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## **INTRODUCTION**

In the last two decades there is a growing interest in the study of functional gastrointestinal (GI) disorders, which is reflected in the increase in the number of publications. This expansion is motivated by the high prevalence of GI symptoms and functional disorders, the lack of knowledge about the exact nature of etiological factors, and the relatively unsatisfactory therapeutic possibilities. According to the biopsychosocial model of GI disorders, the etiological factors, development of the disorder, the clinical picture, outcome and quality of life are related to each other in a circular way. The main goal of the present work was to assess the psychosocial characteristics of Hungarian patients suffering from different functional and organic gastrointestinal disorders. Another aim was to investigate those disorders that are not mentioned in the literature, and to compare functional patients with patients showing similar symptoms, but having organic disorder. As there are no specific questionnaires for the assessment of psychopathological symptoms of gastrointestinal disorder, my last objective was to define the factor structure of the widely used SCL-90-R in this specific group of patients.

## **GOALS**

Assessment of patients suffering from different gastrointestinal disorders. Using both healthy subjects and organic gastrointestinal patients global and more specific differences can be detected between the groups.

Specific aims:

1. Measurement of severity of stressful life events, social support, depressive and anxiety symptoms, dysfunctional attitudes and coping strategies in patients treated at a tertiary care unit because of irritable bowel syndrome (IBS). Our hypothesis was that functional GI patients report more stressful life events and have the same levels of social support compared to patients suffering from inflammatory bowel disorder (IBD) and healthy control subjects. Compared to healthy subjects functional GI patients exhibit more severe depressive and anxiety symptoms, have more pronounced dysfunctional attitudes and maladaptive coping strategies, while compared to organic GI patients they have more pronounced dysfunctional attitudes and maladaptive coping strategies.
2. Assessment of demographic characteristics, psychological distress, severity of gastrointestinal symptoms and level of health-related quality of life in erosive reflux and non-erosive reflux patients presenting for the first time at a gastroenterology

hospital department. According to our hypothesis reflux patients exhibit more severe psychological distress compared to healthy subjects, while non-erosive reflux patients differ from erosive reflux patients on their demographic data and level of psychological distress, but show no difference on severity of GI symptoms and health-related quality of life.

3. Survey of psychopathological symptoms in patients suffering from sphincter of Oddi (SOD) dysfunction. Due to our hypothesis SOD patients are characterized with more severe symptoms as compared to healthy subjects, while compared to depressed patients they have comparable somatization symptoms but less severe global and also more specific psychological distress.
4. Patients referred because of biliary-type pain to a gastroenterology department were assessed for demographic, social and psychological characteristics. Based on our hypothesis the combination of severe environmental stress and psychological distress is associated with functional (sphincter of Oddi dysfunction, SOD) diagnostic outcome. SOD patients as a group are characterised with female predominance, and more severe somatization and anxiety symptoms.
5. Investigation of the factor structure of the Symptom Check List-90-R (SCL-90-R), a widely used inventory for the assessment of global and more specific psychopathological symptoms, and determination of certain special psychopathological profiles in different, functional and organic gastrointestinal disorder subgroups. Our hypothesis was that the original factor structure is not replicable in our sample of GI patients, but one major general distress and a few minor, more specific factors can be identified. The GI groups differ on the newly derived factors from the healthy subjects, and IBS patients are characterized with the most severe psychopathological symptoms.

## **Methods**

### ***1. Psychosocial characteristics of patients suffering from irritable bowel syndrome and inflammatory bowel disorder***

#### *Participants*

Irritable bowel syndrome (IBS) patients (n=46) treated at the MÁV Hospital and Semmelweis University 2<sup>nd</sup> Department of Internal Medicine were involved in the study. Age and gender matched healthy subjects (n=44) and inflammatory bowel disorder (IBD) patients (n=43)

recruited from the MÁV Hospital and Semmelweis University 2<sup>nd</sup> Department of Internal Medicine were included for comparative purposes.

#### *Measures*

1. Social Support Questionnaire
2. Schedule of recent Events
3. Beck Depression Inventory (BDI)
4. Spielberger State-Trait Anxiety Inventory (STAI)
5. Ways of Coping Questionnaire (WCQ)
6. Dysfunctional Attitude Scale (DAS)

#### *Statistical analysis*

Differences among the groups were investigated by General Linear Model (GLM) analysis. Group categories were used as independent variables in the GLM model while the psychosocial measures served as dependent variables.

### ***2. Psychological factors, Quality of Life and Gastrointestinal Symptoms in Erosive and Non-erosive Reflux Disorder***

#### *Résztvevők*

Patients presenting with reflux-like symptoms (n=206) at the Jahn Ferenc Hospital were examined. Based on the presence or absence of mucosal damage patients were categorized as either erosive reflux disorder (ERD) group (examination revealing mucosal damage) (n=103) or non-erosive reflux disorder (NERD) group (examination revealing no mucosal damage) (n=103) patients. Psychological distress (as measured by the SCL-90-R) of healthy subjects (n=407) was used in the analyses for comparative purposes.

#### *Measures*

1. Frequency/fluctuation of reflux symptoms
2. Gastrointestinal Symptom Rating Scale (GSRS)
3. Quality of Life in Reflux and Dyspepsia (QOLRAD)
4. Symptom Checklist-90-R (SCL-90-R)

#### *Statisztikai elemzés*

Mann-Whitney test was used for group comparisons and Spearman rank-correlation coefficients were calculated to determine the level of correlation between variables. Analysis of variance (one-way ANOVA, Kruskal-Wallis test) was used in case of multiple

comparisons. A p value <0.05 was considered as statistically significant. In cases of multiple comparisons the Bonferroni correction was taken into account while interpreting the results.

### ***3. Psychopathological symptoms in patients with sphincter of Oddi dysfunction***

#### *Participants*

Patients suffering from sphincter of Oddi dysfunction (SOD) (n=725) were recruited from the MÁV Hospital, Department of Gastroenterology, Budapest, Hungary. Age and gender matched patients suffering from depression (n=25) were recruited from the Semmelweis University, Department of Psychiatry and Psychotherapy, Budapest, Hungary, normal control subjects (n=25) were members of Semmelweis University, Psychiatry and Psychotherapy Department's medical staff.

#### *Measures*

Symptom Checklist-51 (SCL-51)

#### *Statistical analysis*

Analysis of variance (one-way ANOVA) was used to determine the differences among the groups in terms of their SCL-51 scores.

### ***4. The role of psychosocial factors in the symptom presentation of patients suffering from sphincter of Oddi dysfunction***

#### *Participants*

Patients examined because of biliary type pain (n=85) at the MÁV Hospital entered the study. After the examinations 36 patients were diagnosed as having sphincter of Oddi dysfunction (functional group) and 49 were diagnosed as having other, organic gastrointestinal disorders.

#### *Measures*

1. Level of actual and chronic stress
2. Symptom Checklist-90-R (SCL-90-R)

#### *Statistical analysis*

Relationship between the patients' diagnostic status (SOD, organic) and level of acute and chronic stress and symptom severity as indicated by SCL-90-R subscales was investigated by logistic regression analysis. The diagnostic status was used as a dependent variable in the logistic regression model. Acute and chronic stress, and SCL-90-R symptom severity served as independent variables. Interaction between the independent variables was included in the logistic regression model. Group differences on background and demographic variables were examined by Chi-square analysis (categorical measures) and analysis of variance (continuous

measures). Age and gender were included in the logistic regression model as covariates in order to adjust for any confounding effect resulting from these variables.

### ***5. Factor structure of Symptom Checklist-90-R (SCL-90-R) in different gastrointestinal disorders and differences between the groups***

#### *Participants*

Patients (n=279) treated at the Jahn Ferenc Kórház Gastroenterology Department, Péterfy Hospital Gastroenterology Department and St. Margit Hospital 3<sup>rd</sup> Department of Internal Medicine because of irritable bowel syndrome (IBS) (n=70) and age matched ulcerative colitis (UC) (n=55), non-erosive reflux disorder (NERD) (n=80) and erosive reflux disorder (ERD) (n=74) were examined. For comparative purposes a group of age matched healthy subjects (n=77) was introduced.

#### *Measures*

Symptom Check List-90-R (SCL-90-R).

#### *Statistical analysis*

To determine the empirical factor structure of the SCL-90-R items on the gastrointestinal patient population, a factor analysis based on the correlation matrix of individual items was performed in this sample. The factor structure of SCL-90-R scales was studied by principal component factor analysis with PROMAX rotation. The number of factors were determined on the basis of Cattell's scree-plot. Differences among the four gastrointestinal disorder subgroups in terms of their SCL-90-R profile were investigated by General Linear Model (GLM) analysis. Gastrointestinal disorder subtype categories were used as independent variables in the GLM model while the SCL-90-R factors served as dependent variables.

## **RESULTS**

### ***1. Psychosocial characteristics of patients suffering from irritable bowel syndrome and inflammatory bowel disorder***

No significant differences between the groups were detected on severity of stressful life events and level of social support. IBS and IBD groups showed significantly higher scores compared to healthy subjects, and IBS group showed significantly higher scores compared to IBD group on the depression rating inventory (BDI). When considering the different aspects of depression, IBS patients showed significant differences on negative affect, performance and somatic symptoms subscales of the BDI, while IBD patients exhibited significant differences on the former two subscales but did not differ from healthy subjects on the negative affect subscale of BDI. IBS and IBD groups differed significantly from healthy

subjects on both state and trait scales of the anxiety rating inventory (STAI), but no significant differences were detected between the patient groups. IBS group differed significantly from healthy subjects on global severity of dysfunctional attitudes (DAS scale) and imperatives subscale of DAS, and differed significantly from both IBD and healthy subjects on vulnerability and need for approval subscales of DAS. On the other subscales of DAS no significant differences were detected. IBS and IBD groups had significantly higher scores on escape – avoidance and withdrawal – professional support coping strategies, on the other subscales of WCQ no significant differences were detected.

## ***2. Psychological factors, Quality of Life and Gastrointestinal Symptoms in Erosive and Non-erosive Reflux Disorder***

No significant differences were detected on the severity of gastrointestinal symptoms, health-related quality of life, severity of psychopathological symptoms and frequency/fluctuation of reflux symptoms. Only in the group of erosive reflux disorder patients were detected significant associations between frequency/fluctuation of reflux symptoms and severity of gastrointestinal symptoms and health related quality of life. The severity of actual reflux symptoms showed significant association with the severity of psychopathological symptoms only in the group of non-erosive reflux disorder patients.

## ***3. Psychopathological symptoms in patients with sphincter of Oddi dysfunction***

Depressive patients scored significantly higher compared to SOD patients and healthy subjects on global as well as specific subscales of the SCL-51. SOD patients had significantly higher scores compared to healthy patients on irritability-oversensitivity subscale of SCL-51.

## ***4. The role of psychosocial factors in the symptom presentation of patients suffering from sphincter of Oddi dysfunction***

No significant differences were detected on the severity of actual and chronic stress and severity of psychological distress. In particular, higher acute stress per se (i.e., main effect) was associated with a decreased likelihood of functional (SOD) outcome, whereas the combination of acute stress with chronic stress, and the combination of acute stress with higher severity of global psychopathology (i.e., interaction effect) was related to an increased likelihood of functional (SOD) outcome. We investigated whether the individual subscales of the SCL-90-R scale were associated with an increased likelihood of functional (SOD) outcome. Higher severity of psychoticism in itself was associated with a significant decrease

of likelihood of functional outcome, higher severity of hostility was associated with a marginally significant decrease of likelihood of functional outcome. The combination of acute stress and several psychopathological subscales, like psychoticism, hostility, obsessive-compulsive behaviour, and anxiety was related to a significant increase, and the interaction of acute stress and depression was related to a marginally significant increase in the likelihood of functional (SOD) outcome.

### ***5. Factor structure of Symptom Checklist-90-R (SCL-90-R) in different gastrointestinal disorders and differences between the groups***

Based on the evaluation of scree-plot seven factors were retained for additional analyses. Taken together, the seven factors explained 50.2% of the total variation in SCL90-R scale in this population. The proportion of variance accounted for by the individual factors was 33.1% for factor 1, while factors 2 to 7 accounted for by 4.4% to 2.1% of total variance. Our data are in line with other studies examining the factor structures of the SCL-90-R on other patient populations. Analysis of the item content of the factors shows that items loading on the first factor reflected obsessive-compulsive, depressive and social anxiety symptoms, therefore this factor was labeled as “General distress”. The second factor was a well separated factor containing only symptoms of somatization, therefore this factor was labeled as “Somatization”. The third factor included symptoms of typical for panic and agoraphobia, thus, this factor was labeled as “Panic/Phobia”. The fourth factor, which we labeled as “Paranoia/Hostility”, comprised of items reflecting interpersonal problems due to symptoms of paranoia and hostility. The fifth factor reflected a combination of hostility, sensitivity and depression; accordingly, this factor was labeled as “Irritable depression”. The sixth factor was labeled as “Sleep disturbances” since it contained items related to sleep problems. The seventh factor comprised mainly of items concerning paranoid and psychotic thoughts, and therefore this factor was labelled “Psychoticism”. on SCL-90 Factor 1 (Social anxiety/OCD) the IBS subgroup had a significantly higher score than the other GI disorder and healthy

control subgroups. On SCL-90 Factor 2 (Somatization) three significant contrasts were observed: the IBS subgroup had a significantly higher score than the other GI disorder and healthy control subgroups; the GI disorder subgroups (IBS, UC, NERD, ERD) had significantly higher scores than the healthy control subgroup; the ERD subgroup had significantly higher score than the UC subgroup. On SCL-90 Factor 3 (Panic/Phobia), two differences were detected: the IBS subgroup had a significantly higher score than the other GI disorder and healthy control subgroups; the NERD subgroup had significantly higher score than the healthy control subgroup. On SCL-90 Factor 4 (Paranoia/Hostility) the IBS subgroup had significantly higher score than the NERD, ERD, and healthy control subgroups. On Factor 5 (Irritable depression), the GI disorder subgroups (IBS, UC, NERD, ERD) had significantly higher scores than the healthy control subgroup. On Factor 6 (Sleep disturbance), the IBS subgroup had a significantly higher score than the other GI disorder and healthy control subgroups. On Factor 7 (Psychoticism), the IBS subgroup had significantly higher score than the NERD, ERD, and healthy control subgroups, and the IBD subgroup had significantly higher score than NERD and NC groups. In general female patients exhibited more severe distress as measured by the majority of the SCL-90 factors. Specifically, statistically significant differences (female vs. male) were detected in the case of Factor 2, Factor 5, Factor 6 and Factor 7, a marginally significant difference was obtained in the case of Factor 3 and Factor 4, the difference did not reach a statistically significant level in the case of Factor 1.

## **CONCLUSIONS**

1. Social support and stressful life events by themselves probably do not have significant role in the presentation of psychopathological symptoms in irritable bowel syndrome (IBS) and inflammatory bowel disorder (IBD) patients, these are, at least in part, best explained as consequences of the gastrointestinal disorder. IBS patients are characterized by the presence of dysfunctional attitudes, that can give explanation for

the more severe depressive symptoms compared to IBD patients, and provide support for psychological/psychotherapeutic interventions in this group of patients. Passive, avoidant coping strategies are best viewed as consequences, and not causes of the gastrointestinal disorders. IBS patients, at least at tertiary care centres, should undergo psychiatric/psychological evaluation and treatment.

2. Severity of gastrointestinal and psychopathological symptoms, level of quality of life, and frequency of reflux episodes is not dependent on the presence or absence of mucosal damage. NERD and ERD groups differ on the association of somatic and psychological factors: only in the ERD group is present a strong correlation between frequency of reflux episodes and only the NERD group shows significant association between severity of reflux symptoms and psychopathological symptoms. In NERD patients, as opposite to ERD patients, quality of life and gastrointestinal symptoms are more strongly influenced by psychological factors than the acute or chronic nature of the disorder. Examination psychological and psychophysiological background of enhanced sensitivity to oesophageal stimuli in NERD patients should be further evaluated, and psychological treatment modalities directed towards modification of sensory threshold and dysfunctional interpretation of somatic stimuli should be considered in treatment resistant cases.
3. The more severe psychopathological symptoms diverge depressed patients from SOD patients, the latter group share more features with healthy subjects. Irritability is more pronounced in patients suffering from gastrointestinal disorder, but from the present study it is not clear whether this symptom is specific to the SOD group, or it is a general characteristic. Routine psychiatric screening and intervention in SOD patients is not supported by this study.
4. SOD patients presenting at tertiary care centre are characterized by the presence of high levels of both social and psychological stress. Insufficient coping abilities, the presence of psychopathological symptoms interfere with daily life situations and can lead to symptom presentation. While dealing with functional sphincter of Oddi disorder patients attention should be paid for both external (social) and psychological stressors.
5. Based on the newly derived SCL-90-R factors IBS patients show more severe symptoms and differ from other gastrointestinal disorder patients and healthy subjects. All patient groups, both functional and organic, are characterized with symptoms of irritable depression. We encourage the use of the SCL-90-R rating scale, with our

newly derived factors, as a useful scale for the assessment of general psychological distress and also the more specific psychopathological symptoms in gastrointestinal patient populations.

Results from international studies probably can not be adapted completely to Hungarian patients. The present thesis has new results on both national and international level. We have data on the disease-specific psychosocial characteristics of functional patients as compared to organic patients, we have results on social and psychological stress and its effects on OSD patients. The information and conclusions of the thesis can serve as starting point for future studies assessing precipitating and sustaining factors or examining therapeutic efficacies. With the demonstration of the importance of psychosocial characteristics the attention can be directed to the significance of biopsychosocial aspects, which can in turn lead to a better understanding of patients and more efficient treatment for the disorder.

## **PUBLICATIONS**

### **Publications related to the thesis**

1. **Kovács Z**, Kovács F, Pap Á. (2005) Psychological disturbances in patients with sphincter of Oddi dysfunction. *Journal of Clinical Psychology in Medical Settings*, 12(4):377-381.
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1. **Kovács Z**, Kis R, Dezsényi B. (2003) Állat-asszisztált foglalkozás egy idősök otthonában. *Rehabilitáció*, 13(3-4): 21-25.
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