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Functional dyspepsia impares quality of life in the adult population

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Functional dyspepsia impares quality of life in the adult population

~~Impairment of quality of life in a general population with functional dyspepsia applying the Rome III criteria~~

Short title: Functional Dyspepsia and quality of life

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Abstract

Background: Data on the impact of functional dyspepsia on health related quality of life in the general adult population are scarce.

Aim: To explored the impact of functional dyspepsia applying the Rome III definition on health related quality of life in the general population.

Method: A random sample of an adult Swedish population (n=1,001, The Kalixanda study) was invited to undergo an oesophagogastroduodenoscopy. An extended abdominal symptom questionnaire and Short Form 36 (SF-36) questionnaire, which includes eight domains measuring physical, mental and social aspects of quality of life, were completed at the clinic visit just before oesophagogastroduodenoscopy.

Results: 202 (20.2%) individuals reported uninvestigated dyspepsia (UID), 157 (15.7%) functional dyspepsia (FD), 52 (5.2%) epigastric pain syndrome (EPS) and 122 (12.2%) postprandial distress syndrome (PDS). UID, FD and PDS had a clinically meaningful (a ≥5 point) and statistically significant impact ($p<0.05$) on health related quality of life in all SF-36 domains except for Role Emotional. EPS had a significant impact on Bodily Pain and Vitality. Overlap of FD with irritable bowel syndrome (IBS) had a significant impact on Bodily Pain ($p=0.002$) and General Health ($p=0.02$) while FD overlap with gastro-oesophageal reflux symptoms (GORS) had a significant impact on Bodily Pain ($p=0.02$) compared with FD without any overlap with IBS or GORS.

Conclusions: Functional dyspepsia impacts all main domains describing physical, mental and social aspects of health related quality of life in the general population. Overlap of FD with IBS or GORS impacts the domain related to bodily pain.

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Introduction

In the western world, between 20% and 37% of adult population suffer from chronic or recurrent dyspepsia, although this number is influenced by the definition applied.[1-3] The symptoms of dyspepsia also remain common in the elderly.[4] The most frequently applied criteria to diagnose functional dyspepsia (FD) have been the Rome I and Rome II definitions.[5, 6] Notably, major changes were made in the Rome III criteria for functional dyspepsia (FD) where two distinct syndromes were postulated¸ postprandial distress syndrome (PDS) and epigastric pain syndrome (EPS).[7] A diagnosis of FD requires exclusion of structural disease.

There are a number of outpatient studies suggesting that FD impairs health related quality of life (HRQoL) in patients, and the impact seems to be on all major variables of quality of life, namely mental, social and physical functioning.[8-13] ~~A study from Germany reported that HRQoL in FD was more severely impaired than in chronic liver disease, and co-morbid anxiety and/or depression significantly contributed to impairment of HRQoL.[11] A Swedish case control study found that FD had a greater impact on HRQoL in women than men in terms of their daily activities.[10] A Spanish follow up study of patients with FD observed some improvement of HRQoL after 1 year follow up.[13]~~ Other data suggest that impaired HRQoL in gastro-oesophageal reflux disease might depend on concomitant dyspepsia.[14] In a population-based, nested, case-control study, subjects reporting symptoms of either dyspepsia or irritable bowel syndrome and healthy controls were interviewed and completed questionnaires on psychological measures plus the validated Short Form 36 questionnaire (SF-36); an association between lower mental

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HRQoL and dyspepsia was found after adjusting for psychological covariates, but FD was not confirmed by endoscopy.[15] There are two recently published studies from Asia applying the Rome III definition of functional dyspepsia and focusing on the impact of overlapping FD-irritable bowel syndrome (FD-IBS) and FD-gastro-oesophageal reflux symptoms (FD-GORS) on HRQoL[16, 17] ~~The Korean study was a case-control study excluding all organic reasons of dyspepsia by both upper and lower gastrointestinal endoscopies and concluded that overlapping FD-IBS had more impact on HRQoL than FD or IBS alone had.[17] The Japanese cross-sectional study included Japanese workers being routinely screened for gastric cancer, and the definition of FD and organic dyspepsia was based on a a symptom questionnaire.[16]~~ In the Japanese study FD had a significant impact on HRQoL in all physical and psychological domains of the Short Form 8 questionnaire and overlap with IBS and GORS was associated with significantly worsened HRQoL and the Korean study concluded that overlapping FD-IBS had more impact on HRQoL than FD or IBS alone had.[16, 17]

In a Swedish population-based study assessed by upper endoscopy, we have earlier reported the prevalence of uninvestigated dyspepsia (UID) and FD according to the Rome III definition to be 20% and 16%, respectively.[18] While we have also reported the impact of gastro-oesophageal reflux symptoms on HRQoL in this population and,[18-21] we have not assessed the impact of uninvestigated dyspepsia or FD. Only 5% of dyspeptics present for medical consultation annually[22] and the lifetime consultation rate is 25-50%.[2, 23] Therefore, to optimally define the impact of FD on HRQoL requires a

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general adult population that captures non-presenters where structural disease has been excluded by upper endoscopy; no such data have been published.

Our aim was to explore if HRQoL in a general population sample, using the validated Short Form 36 questionnaire (SF-36), is impaired in FD and among FD subgroups defined according to the Rome III definition.

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Materials and Methods

Setting and participants

The Kalixanda study setting consisted of two neighboring communities in Northern Sweden (Kalix and Haparanda) with 28,988 inhabitants (as of December 1998).[3] Every seventh adult (n=3,000) from the target population (20-80 years of age, n=21,610 in September 1998) was drawn. The sampled subjects were given an identification number (1-3,000) in random order.[3]

Study design and logistics

The original study population (n=3,000) was invited by mail to take part. The invitation letter included the validated Abdominal Symptom Questionnaire (ASQ)[24] to be returned by mail. Of the original study population 2,860 were eligible for inclusion. The overall response rate was 74.2 % (n=2,122) of the eligible study population.[3]

1,001 responders to ASQ were invited in random order to oesophagogastroduodenoscopy and response rate for those eligible for the oesophagogastroduodenoscopy was 73.3 % as described elsewhere.[3] At the visit for the oesophagogastroduodenoscopy, the participants filled in a more comprehensive ASQ.[3]

The study protocol was approved by the Umeå University ethics committee and the study was conducted according to the declaration of Helsinki. Informed consent was obtained from all participants.

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Assessments

ASQ is a questionnaire assessing gastrointestinal symptoms and it has been found to be valid, reproducible and reliable.[24, 25] The questionnaire was designed before the Rome III era but it had been updated to reflect Rome II definition and it now includes all the questions reflecting the Rome III definition of FD except for onset of dyspepsia which we can define to 3 months rather than 6 months.[24] The extended ASQ included the frequency of each symptom during the prior 3 months (monthly, weekly or daily symptoms) and has been revalidated.[25]

The SF-36 is a generic measure of HRQoL that has been widely used in patients having dyspepsia.[10, 11, 26] The validated acute version of the SF-36, which has a 1 week recall period, was used to measure quality of life with the 8 standard domains of:

1. *Physical Functioning* describing the individual's ability to perform physical activities
2. *Role Physical* describing the individual's performances of work and other daily activities
3. *Bodily Pain* describing limitations in life due to physical pain
4. *General Health* evaluating personal judgment of general health
5. *Vitality* measuring personal energy in daily life
6. *Social Functioning* measuring impact of physical or emotional problems on social life
7. *Mental Health* showing impact of nervousness and depression on daily life ~~and~~
8. *Role Emotional* describes problems with work or other daily activities as a result of emotional problems.[27]

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The SF-36 scale is graded 0-100 (the higher the better) in all 8 domains It has been shown previously that a difference in SF-36 score of 5 points or greater in comparison with symptom free individuals is clinically significant[28] as long as such a difference is also statistically significant.[29]

A medical history questionnaire, completed during the clinic visit, asked whether subjects had consulted a doctor regarding gastrointestinal and other symptoms during the past year, and asked also wether they had used any gastrointestinal medications over the past 3 months.

Definitions of symptom groups

Uninvestigated dyspepsia (UID) was defined based on the Rome III definition: weekly bothersome postprandial fullness or early satiation, or epigastric pain and/or epigastric burning (symptom onset 6 months prior the survey was not asked about in the ASQ). Pain and burning were not allowed to be relieved by defecation.[7]

Functional dyspepsia (FD) was defined as uninvestigated dyspepsia without findings of oesophagitis, peptic ulcer, celiac disease or cancer, and no evidence of other structural disease at endoscopy that was likely to explain the symptoms. Further FD, according to the Rome III definition, was divided into:

1. Postprandial Distress Syndrome (PDS) consisting of bothersome postprandial fullness and/or early satiation.

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2. Epigastric Pain Syndrome (EPS) consisting of pain or burning localized to the epigastric area and not generalized or localized to other abdominal or chest regions, and not relieved by defecation. Overlap between PDS and EPS was allowed according to the Rome III definition.[7]

FD only was defined as FD without any overlap with irritable bowel syndrome (IBS) and/or gastro-oesophageal reflux symptoms (GORS).

No dyspepsia was defined as individuals not reporting any type of dyspeptic symptoms.

Organic dyspepsia was defined as individuals reporting any type of dyspepsia with concomitant finding of erosive oesophagitis, peptic ulcer disease (PUD), celiac disease, cancer or other organic disease as the likely reason for dyspepsia.

Gastro-oesophageal reflux symptoms (GORS) were defined as the presence of troublesome heartburn and/or acid regurgitation over the past three months.[30, 31]

Irritable bowel syndrome (IBS) was defined as troublesome abdominal pain or discomfort located at any site plus concomitant bowel habit disturbances.This simple definition has been used previously and shown to produce results reasonably concordant with the validated Rome I criteria for IBS.[32, 33]

Definition of anxiety and depression

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The validated Hospital Anxiety and Depression scale (HADs) was used define anxiety and depression. A score from 11 or more was used as cut off level for both clinically relevant anxiety and depression.[34]

Oesophagogastroduodenoscopy

The upper endoscopies were undertaken by three experienced endoscopists, in the two clinics (Kalix and Haparanda), which gave sole medical cover to the area. The endoscopists were unaware of the symptoms of the subjects before endoscopy.[3]

Statistical analysis

Mean SF-36 scores and standard deviations were determined for non-dyspeptics, uninvestigated dyspepsia, FD and subgroups of FD and for peptic ulcer disease and organic dyspepsia, and tabled (or graphed) to compare with the Swedish mean SF-36 scores. The mean values were compared with mean SF-36 domain scores of non-dyspeptics to identify clinically meaningful (≥5-point) differences. Statistical significance was analyzed using a two sample T-test and Satterthwaite's approximation was used when ever variances in SF-36 scores were tested unequal. The association of UID, FD, EPS and PDS on dichotomized SF-36 domains was also analyzed using multivariate logistic regression model adjusting for anxiety, depression, use of proton pump inhibitors, age and gender. Fisher's exact tests were applied in appropriate analyses. A two sided p-value of < 0.05 was regarded as statistically significant. The STATA 8 program was used for the analyses.[35]

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Results

Endoscopy with biopsy was performed to 1,000 responders and the data reported here are from the 999 subjects who also completed the SF-36 questionnaire. The study population (51% female; mean age of 54 years) was representative of the source population as a whole. Overall 202 (20.2%) out of a study population of 999 individuals reported UID. FD was reported by 157 (15.7%) and of these 52 (5.2%) had epigastric pain syndrome (EPS) and 122 (12.2%) had PDS. EPS and PDS overlapped in 17 (1.7%) cases. FD only (FD without any overlap with IBS or GORS) was reported by 31 individuals (3.1%). In total, 797 (79.7%) reported no dyspeptic symptoms at all. Demographic data are presented in Table 1. Mean SF-36 scores in this study population ranged from 69.3 (general health) to 89.9 (social functioning). The differences of Kalixanda means were clinically meaningful (≥5 point difference) compared with Swedish means only in Role Physical and General Health (Table 2, Figure 1). Of the individuals having UID 5.4% had consulted a doctor due to dyspeptic symptoms the year prior to the study and of the individuals having FD 6.0% had consulted a doctor due to dyspepsia. Respective figures for EPS, PDS and organic dyspepsia were 0%, 7.7% and 3.6%.

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Impact of different dyspepsia groups on SF-36 domains

Subjects with UID and FD reported a clinically meaningful (≥5 point) and statistically significant reduction in HRQoL in all SF-36 domains, except for Role Emotional, compared with non-dyspeptics (Table 2, Figure 1). UID scored lower than FD in every domain of SF-36 aside from Physical Functioning but the differences were small and not clinically meaningful or statistically significant. Women reporting FD had clinically significantly lower mean scores than men in Bodily Pain ~~and Role Emotional~~ and men reporting FD in Role Physical and Role Emotianal, but these differences were not statistically significant (Table 2).

All SF-36 domain scores in PDS, except for Role Emotional, were both clinically and statistically significantly lower compared with non-dyspeptic individuals. Subjects with EPS had a clinically and statistically significant impairment of HRQoL in Bodily Pain and Vitality compared with non-dyspeptics (Table 2).

The results of significance of FD, EPS and PDS on HRQoL stand also when analyzing with multivariate logistic regression adjusting for anxiety, depression and use of proton pump inhibitors, with the exception of Social Functioning in FD and Vitality in EPS (Table 3).

Impact of overlap of FD with IBS and overlap of FD with GORS on HRQoL

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Overlap with IBS had a clinically meaningful impact on the SF-36 domain Role Physical and both a clinically and statistically significant impact on Bodily Pain (p=0.002) and General Health (p=0.02) compared with FD only (FD without any overlap with IBS or GORS) (Table 4).

FD overlap with GORS has meaningful clinical impact on SF-36 domain Role Physical and both clinically and statistically significant impact on Bodily Pain (p=0.02) compared with FD only (FD without any overlap with IBS or GORS) (Table 4). FD overlap with GORS and IBS is presented in Figure 2.

Impact of organic dyspepsia and PUD on HRQoL

Individuals having organic dyspepsia scored lower in every SF-36 domain except for Physical Functioning compared with individuals having FD; the differences were clinically meaningful in Role Physical and General Health but statistically significant in none of the SF-36 domains (Table 2).

Individuals having organic dyspepsia had clinically meaningfully lower scores in all SF-36 domains compared with non-dyspeptics and the difference was statistically significant in all domains aside from Role Emotional (Table 2). The associations of organic dyspepsia with impared HRQoL were confirmed ~~are also shown~~ in multivariate logistic regression aside from Social Functioning (Table 3).

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PUD had a clinically meaningful impact on HRQol compared with FD in the domains Role Physical and Role Emotional but these differences were not statistically significant (Table 2).

PUD had a clinically meaningful and statistically significant impact on HRQoL in all other domains of SF-36 compared with non-dyspeptics except on Mental Health (Table 2). The associations of PUD with clinically meanigfully worsened HRQoL are also shown in multivariate logistic regression (Table 3).

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Discussion

This is the first population-based cross-sectional endoscopic study to our knowledge applying the Rome III definition for FD to study the impact of dyspepsia on HRQoL in a general adult population. The SF-36 domain scores in the Kalixanda endoscopic study population differ from Swedish mean values only for Role Physical and General Health, and their mean values are very near the respective values found in the Finnish general population,[36] noting approximately 20% of the participants were of Finnish origin. The impact of UID and FD on HRQoL appears to be significant both clinically and statistically in all domains with the exception of Role Emotional.

Our findings are consistent with the published literature. A literature review in 2003 found six studies that used a validated questionnaire measuring HRQoL, although none applied the Rome III criteria.[26] There was evidence for impairment of HRQoL in these studies, but none of these examined HRQoL among samples of the general population.[26] A small case control study applied the Rome III definition for dyspepsia and found significantly decreased HRQoL in FD and in both FD subgroups (PDS and EPS) as well as an association of symptoms with abnormal sensory and motor function;[12] however, this was not a population-based sample and may have been subject to serious referral bias. Our results are also in line with the results of Japanese and Korean studies showing a significant impact on HRQoL in physical and pain related SF-36 domains. Both these studies did apply the Rome III definition of FD and the Korean study did also exclude organic reasons of FD by endoscopies but it was a case-control study and the Japanese

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study was not based on the general population, and gastrointestinal endoscopy was not included in the study protocol.[16, 17] Our study shows also that FD overlaps with both IBS and GORS, and the overlap impacts HRQoL. According to expert opinion in persisting dyspepsia the precence of heartburn does not exclude the diagnoses of PDS or EPS and the precence of IBS does not exclude the diagnoses of any of functional gastroduodenal disorders.[7] We therefore believe the approach taken here is suitable.

Our results do not confirm the results from a Swedish case control study where it was shown that women scored lower than men in domains describing physical activity.[10] Women scored only clinically meaningfully lower in our population-based study in the domain describing Bodily Pain, and men had clinically meaningfully lower mean scores in domains describing Physical and Emotional Roles. Further exploration of gender differences in FD would be valuable. Haag et al. suggested that co-excisting anxiety and depression have significant impact on HRQoL in FD.[11] Our results show that FD in a general adult population independently impacts HRQoL regardless of the presence of anxiety or depression.

We report new data on the impact of PDS and EPS on QoL. The impact of PDS is clinically and statistically significant compared with controls except for Role Emotional and the results are consistently the same when analyzing for possible confounders such as anxiety, depression and use of proton pump inhibitors. Subjects with EPS had a clinically and statistically relevant impairment of HRQoL only in two domains (Bodily Pain and Vitality) compared with non-dyspeptics.

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Organic dyspepsia had a more clinically meaningfully impact on quality of life only in the domains Role Physical and General Health compared with FD. Compared with FD, PUD subjects reported lower Role Physical and Role Emotional scores, while the mean level of Bodily Pain, Physical Functioning and Vitality were on the same level as individuals having FD. PUD seems to impact HRQoL significantly even though a remarkable proportion of individuals with PUD in this study were asymptomatic.[37]

~~Our study shows that 5-6% of individuals reporting UID or FD did consult a doctor for dyspepsia the yer prior to the study. This result is in line with earlier studies.[1, 2]~~

The strength of our study is its population-based design with a randomly selected adult population undergoing symptom surveillance and then an endoscopic sub-study of this adult population. We obtained a very high response rate and thus the study is most probably representative of the general adult population in Sweden and in other western countries with similar socioeconomic circumstances.[3] FD was defined by carefully collecting individuals' medical history and by performing an oesophagogastroduodenoscopy with biopsies in all the participants.

One potential weakness is that due to the study design before the era of the Rome III definition for dyspepsia, we could define the symptom onset 3 months prior to the study but not 6 months prior as it should be according to the Rome III definition. Some groups in the study are relatively small and type II errors cannot always be excluded.

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In conclusion, our population-based study applying the Rome III definition for dyspepsia shows that FD has a significant impact on HRQoL in all domains describing physical activity and physical role, and in all other psychological domains but not the domain describing emotional role. PDS seems to impair HRQoL in all SF-36 domains more than EPS, while FD overlap both with IBS and GORS has a significant impact on Bodily Pain.

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Figure legends

Figure 1. Means of SF-36 domains in Sweden and in different dyspepsia groups. The Kalixanda endoscopic population-based study December 1998-June 2001.

Foot notes:

UID=uninvestigated dyspepsia, FD=functional dyspepsia, EPS=epigastric pain syndrome, PUD=peptic ulcer disease

PF=physical functioning, RP=role physical, BP= bodily pain, GH=general health, VT=vitality, SF=social functioning, RE=role emotional, MH=mental health

Figure 2. Overlap of functional dyspepsia (FD) with irritable bowel syndrome (IBS) and gastro-oesophageal reflux symptoms (GORS).

Foot notes:

FD=functional dyspepsia (n=157)

FD only=functional dyspepsia without any overlap with gastro-oesophageal reflux symptoms or irritable bowel syndrome (n=31)

Overlap FD-IBS=overlap of functional dyspepsia with irritable bowel syndrome (n=29)

Overlap FD-GORS=overlap of functional dyspepsia with gastro-oesophageal reflux symptoms (n=39)

Overlap FD-GORS and IBS= overlap of functional dyspepsia both with gastro-oesophageal reflux symptoms and irritable bowel syndrome (n=58)

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Figure1

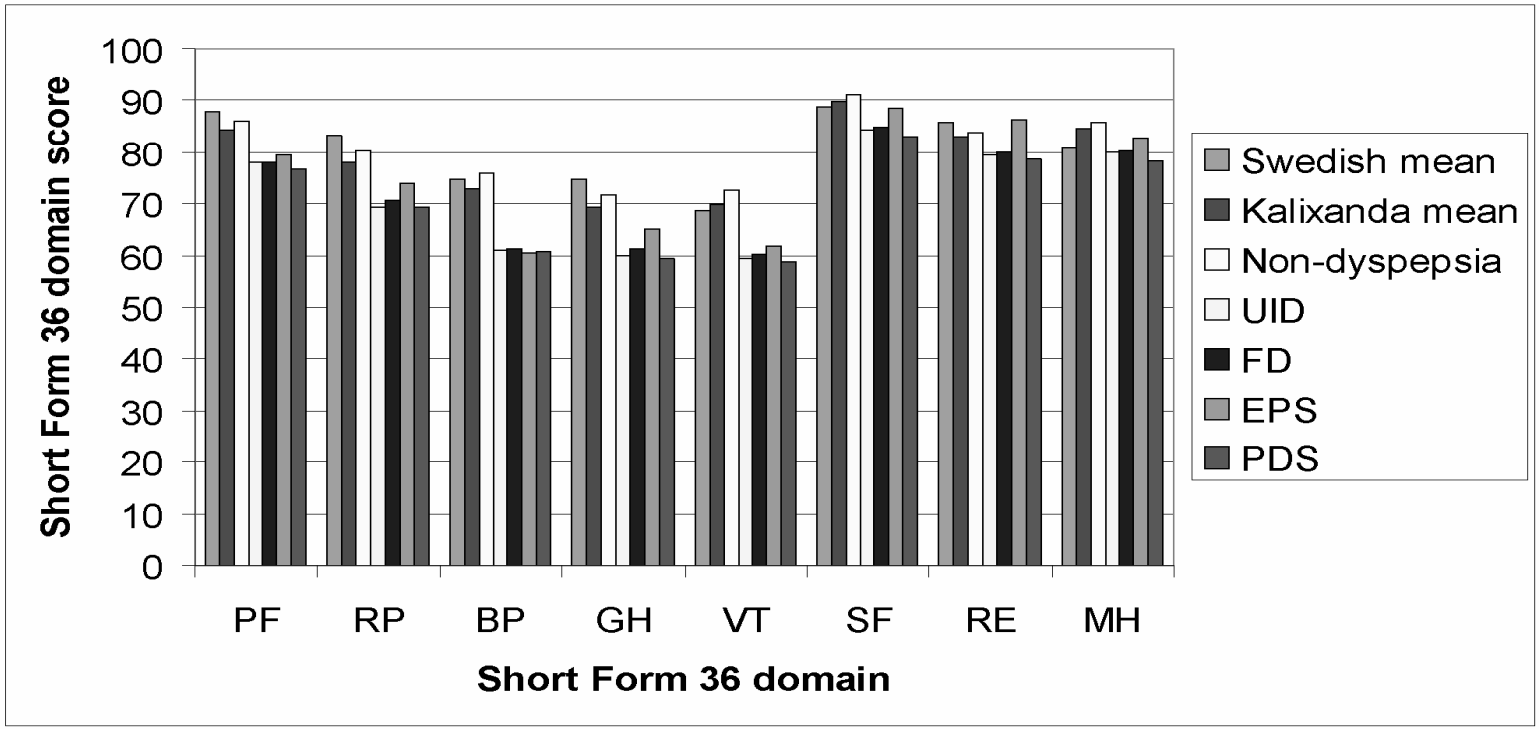
Short Form 36 domain score
100
90
80
70
60
50
40
30
20
10
0
PF
RP
BP
GH
VT
SF
RE
MH
Short Form 36 domain
Swedish mean
Kalixanda mean
Non-dyspepsia
UID
FD
EPS
PDS

Figure 2

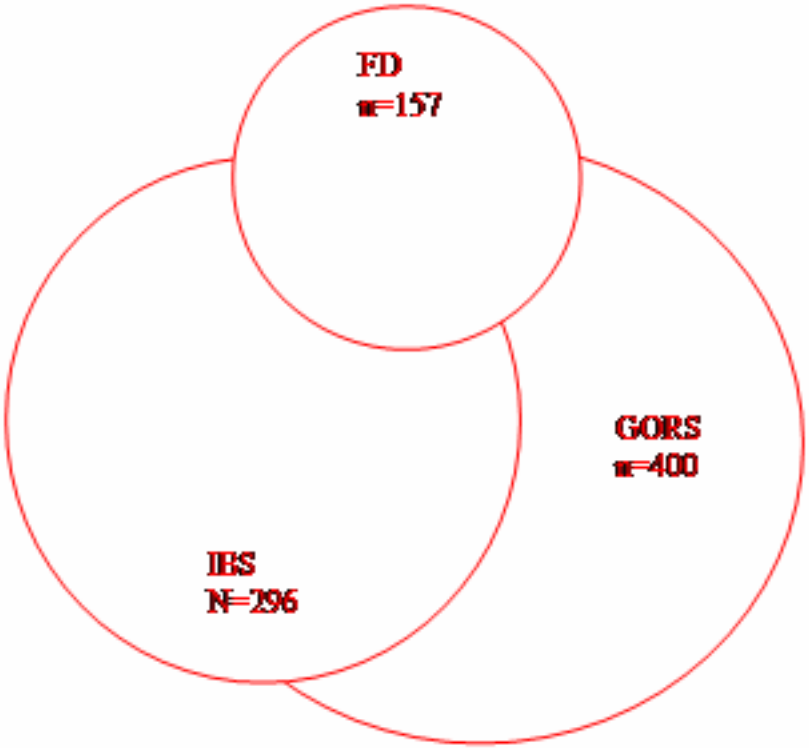

Table 1. Demographic data of the Kalixanda study population (n=999).

Kalixanda population-based endoscopic study December 1998-June 2001

	Males Proportion 95% CI	**H. pylori** Proportion 95% CI	**Low education** Proportion 95% CI	**Mean age** Years SD
No dyspepsia n=797	52.8	33.7	58.6	54.8
(79.7%)	49.3-56.3	30.4-37.0	55.2-62.0	13.9
UID n=202	32.7	34.6	56.9	51.2
(20.2%)	26.2-39.2	28.0-41.2	50.1-63.7	14.0
FD n=157	27.4	33.3	58.6	51.2
(15.7%)	20.4-34.4	25.9-40.7	50.9-66.3	14.4
EPS n=52	17.3	32.7	51.9	51.5
(5.2%)	0.1-13.9	19.9-45.5	38.3-65.5	14.1
PDS n=122	30.3	33.6	59.8	50.7
(12.2%)	22.1-38.5	25.2-42.0	51.1-68.5	14.5

UID = uninvestigated dyspepsia, FD = functional dyspepsia

EPS = epigastric pain syndrome, PDS = postprandial distress syndrome

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Table 2. Mean values of Short Form-36 domains in Sweden, Kalixanda study population and different dyspepsia groups and PUD. Kalixanda population-based endoscopic study December 1998-June 2001

	PF Mean 95% CI	**RP** Mean 95% CI	**BP** Mean 95% CI	**GH** Mean 95% CI	**VT** Mean 95% CI	**SF** Mean 95% CI	**RE** Mean 95% CI	**MH** Mean 95% CI
Swedish mean values	**87.9**	**83.2**	**74.8**	**74.8**	**68.8**	**88.6**	**85.7**	**80.9**
Kalixanda means n=999	84.4	78.0	72.9	69.3	69.7	89.9	83.0	84.7
	83.1-85.8	75.7-80.3	71.2-74.5	68.0-70.7	68.3-71.1	88.7-91.1	80.9-85.0	83.7-85.6
No dyspepsia n=797	**86.1**	**80.3**	**75.9**	**71.7**	**72.4**	**91.3**	**83.9**	**85.8**
	84.7-87.5	**77.8-82.8**	**74.1-77.7**	**70.3-73.2**	**70.9-73.9**	**90.0-92.6**	**81.7-86.2**	**84.8-86.9**
UID n=202	77.9	69.1	61.0	59.9	59.3	84.4	79.4	80.0
	74.4-81.4	63.6-74.6	57.6-64.5	56.7-63.1	55.9-62.7	81.2-87.7	74.6-84.2	77.5-82.5
FD n=157	77.9	70.7	61.2	61.3	60.1	84.9	79.9	80.1
	74.0-81.9	64.5-76.9	57.3-65.2	57.6-64.9	56.4-63.9	81.3-88.6	74.6-85.2	77.3-82.8
EPS n=52	79.4	74.0	60.5	65.2	61.7	88.5	86.3	82.6
	71.6-87.3	62.9-85.1	53.0-68.0	58.4-71.9	54.6-68.8	82.3-94.7	78.3-94.3	77.9-87.3
PDS n=122	76.7	69.1	60.8	59.4	58.8	83.1	78.7	78.2
	72.1-81.3	62.0-76.1	56.3-65.4	55.2-63.6	54.6-63.0	78.8-87.3	72.5-84.9	74.9-81.4
Organic dyspepsia n=45	77.9	63.1	60.4	55.1	56.5	82.8	77.5	79.8
	70.4-85.5	51.1-75.0	53.6-67.2	48.3-61.8	48.5-64.5	75.6-89.9	66.4-88.7	73.8-85.8
PUD n=41	75.5	63.8	60.5	62.0	62.1	82.0	71.7	83.5
	67.6-83.4	50.8-76.9	52.4-68.7	55.5-68.5	54.9-69.3	74.8-89.2	58.8-84.6	78.8-88.2
Women with FD n=114	77.7	72.4	59.1	62.2	58.9	86.0	82.2	80.5
	73.3-82.1	65.2-79.5	54.6-63.5	58.1-66.3	54.6-63.3	81.9-90.2	76.2-88.1	77.3-83.8
Men with FD n=43	78.4	66.3	67.0	58.8	63.3	82.0	73.8	78.9
	69.5-87.4	53.5-79.1	58.3-75.6	50.9-66.7	55.7-70.9	74.3-89.6	62.2-85.4	73.6-84.1

PF=physical functioning, RP=role physical, BP=bodily pain, GH=general health, SF=social functioning, RE=role emotional, MH=mental health, UID=uninvstigated dyspepsia, FD=functional dyspepsia, EPS=epigastric pain syndrome, PDS=postprandial distress syndrome, PUD=peptic ulcer disease

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Table 3. Associations of UID, FD, EPS, PDS organic dyspepsia and PUD with Short Form-36 domains in multivariate logistic regression. Kalixanda population-based endoscopic study December 1998-June 2001

	PF OR 95% CI	**RP** OR 95% CI	**BP** OR 95% CI	**GH** OR 95% CI	**VT** OR 95% CI	**SF** OR 95% CI	**RE** OR 95% CI	**MH** OR 95% CI
UID n=202	2.46	2.80	2.63	2.56	2.11	1.53	1.50	1.87
	1.68-3.61	1.84-4.25	1.85-3.73	1.79-3.65	1.49-2.99	1.03-2.27	1.03-2.20	1.31-2.67
FD n=157	2.34	2.56	2.36	2.25	1.98	1.47	1.57	1.98
	1.53-3.58	1.62-4.06	1.60-3.48	1.52-3.34	1.34-2.92	0.94-2.29	1.03-2.40	1.33-2.95
EPS n=52	1.50	1.99	2.06	1.53	1.69	0.99	1.20	1.59
	0.74-3.04	0.93-4.28	1.09-3.89	0.80-2.91	0.90-3.20	0.46-2.13	0.58-2.49	0.83-3.03
PDS n=122	2.73	2.68	2.62	2.53	2.04	1.75	1.55	2.31
	1.71-4.37	1.62-4.43	1.69-4.05	1.63-3.92	1.33-3.14	1.09-2.80	0.98-2.47	1.49-3.58
Organic dyspepsia n=45	2.74	3.64	3.88	3.72	2.61	1.81	1.43	1.51
	1.35-5.59	1.61-8.26	1.97-7.65	1.88-7.33	1.32-5.14	0.89-3.70	0.70-2.93	0.78-2.96
PUD n=41	2.84	3.41	3.26	2.29	1.93	3.00	2.20	1.10
	1.36-5.94	1.53-7.58	1.67-6.38	1,15-4.57	1.00-3.76	1.50-6.00	1.10-4.42	0.52-2.29

PF=physical functioning, RP=role physical, BP=bodily pain, GH=general health, SF=social functioning, RE=role emotional, MH=mental health, UID=uninvestigated dyspepsia, FD=functional dyspepsia, EPS=epigastric pain syndrome, PDS=postprandial distress syndrome, PUD=peptic ulcer disease

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Table 4. Mean values of Short Form 36 domains in Functional dyspepsia and overlap groups

FD-IBS, FD-GORS and FD- both GORS and IBS. Kalixanda population-based endoscopic study December 1998-June 2001

	PF Mean 95% CI	**RP** Mean 95% CI	**BP** Mean 95% CI	**GH** Mean 95% CI	**VT** Mean 95% CI	**SF** Mean 95% CI	**RE** Mean 95% CI	**MH** Mean 95% CI
FD n=157	**77.9**	**70.7**	**61.2**	**61.3**	**60.1**	**84.9**	**79.9**	**80.1**
	73.0-81.9	**64.5-76.9**	**57.3-65.2**	**57.6-64.9**	**56.4-63.9**	**81.3-88.6**	**74.6-85.2**	**77.3-82.8**
FD only n=31	79.5	78.2	72.4	67.1	59.0	87.5	75.3	80.3
	69.2-89.8	65.1-91.4	61.3-83.4	59.1-75.0	49.0-69.0	79.3-95.7	61.9-88.7	74.9-85.6
Overlap FD-IBS n=29	77.2	62.9	51.4	57.6	55.7	81.9	74.7	78.1
	66.8-87.7	46.0-79.9	42.2-60.7	47.5-67.8	45.0-66.5	72.4-91.4	59.3-90.1	70.8-85.3
Overlap FD-GORS n=39	80.0	67.3	63.1	66.1	63.3	84.9	81.2	82.3
	72.8-87.2	54.5-80.1	55.3-70.9	59.1-73.1	56.2-70.4	76.7-93.0	70.7-91.7	76.0-88.5
Overlap FD-GORS and IBS n=58	75.8	72.8	59.0	56.9	60.7	85.1	84.2	79.5
	69.5-82.2	62.8-82.9	53.4-64.6	51.2-62.7	55.2-66.2	79.3-90.8	76.5-91.9	75.1-83.9

PF=physical functioning, RP=role physical, BP=bodily pain, GH=general health, SF=social functioning, RE=role emotional, MH=mental health

FD=functional dyspepsia

FD only= FD without any overlap with irritable bowel syndrome or gastro-oesophageal reflux symptoms

Overlap FD-IBS=Functional dyspepsia overlapping with irritable bowel syndrome

Overlap FD-GORS=Functional dyspepsia overlapping with gastro-oesophageal reflux symptoms

Overlap FD-GORS and IBS= overlap of functional dyspepsia both with gastro-oesophageal reflux symptoms and irritable bowel syndrome

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