J Pediatr Res 2022;9(3):286-91
DOI: 10.4274/jpr.galenos.2022.64872

Original Article

Monitoring the Quality of Life in Dyspeptic Children with KINDL Scale

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ABSTRACT

Aim: We aimed to evaluate quality of life in functional and organic dyspepsia and its change during follow-up.

Materials and Methods: Children between 4-17 years of age with dyspeptic complaints were enrolled into this study. Organic and functional dyspepsia were differentiated based on clinical findings and the findings of upper gastrointestinal endoscopy, if performed. The Kinder Lebensqualität Fragebogen (KINDL) questionnaire was conducted when the patients were referred to hospital and at their 1st and 3rd month visits, prospectively. Both groups were compared with regard to their demographic data, symptoms and quality of life scores. Factors which affected the KINDL results and any changes in the KINDL scores during follow-up were evaluated.

Results: The study group consisted of 71 functional dyspepsia and 65 organic dyspepsia patients. The mean quality of life scores in the physical wellness and school subscales were higher among the functional dyspepsia patients. The total score of the functional dyspepsia group was higher. There was no relation between the individual's gender, their number of symptoms and their KINDL scores. At the first month visit, the total scores and mean scores of the self-esteem, family, school and friends subscales were higher in the functional dyspepsia group. At the third month visit, the mean self-esteem score was higher in the functional dyspepsia group. Total scores increased significantly during follow-up in both the organic dyspepsia and functional dyspepsia groups. This increase was higher in the organic dyspepsia group.

Conclusion: Quality of life in both functional dyspepsia and organic dyspepsia patients is affected; applying recommendations and treatment increased the quality of life of both groups. A quality of life scale can be used to monitor response to treatment.

Keywords: Children, follow-up, functional dyspepsia, quality of life, organic dyspepsia

Introduction

Dyspepsia is a common upper gastrointestinal clinical symptom group resulting from various causes with a wide range of symptoms and signs. Symptoms such as abdominal discomfort, epigastric pain or burning, postprandial fullness, or early satiety are defined as dyspepsia (1-3). Sometimes bloating, heartburn, or nausea may also be present (4). Dyspepsia may be due to various reasons such as peptic ulcer disease, gastrointestinal lesions due to non-steroid anti-inflammatory drugs, or non-organic non-ulcer functional reasons (1-3).

Quality of life (QoL) is defined as the individual daily life responses to any physical, mental and social impacts of a disease which affect individual satisfaction in certain life conditions. QoL scales are used to identify in which dimensions children with various chronic complaints and

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Received: 11.02.2022 **Accepted:** 15.04.2022

developmental problems are affected by their disease or any therapeutic interventions regarding their condition (5). Dyspepsia is one of these conditions which has a negative impact on QoL. Studies have shown that children with functional dyspepsia (FD) have a lower QoL in comparison to healthy children. However, there is little data regarding their QoL after treatment (6).

In this study, we aimed to monitor the QoL of patients with functional and organic dyspepsia (OD) by means of an age appropriate Kinder Lebensqualität Fragebogen (KINDL) scale during their follow-up and also to evaluate whether there are any differences between these two groups in terms of their QoL.

Materials and Methods

In this study, the QoL of children with organic and functional dyspepsia was evaluated via the KINDL scale before and after treatment. Patients between 4 and 17 years of age with dyspepsia who were admitted into the pediatric gastroenterology outpatient clinic of Dr. Behçet Uz Pediatric Diseases and Surgery Training and Research Hospital between April 2015 and October 2015 and who agreed to participate were enrolled into this study. Pain or burning in the epigastrium, postprandial fullness or early satiety were accepted as dyspeptic complaints (1,2). Those patients with chronic diseases other than dyspepsia were excluded as these complaints might also affect their QoL. A minimum of 64 patients were planned to be included into both the organic and functional dyspepsia groups considering a power size of 80% and an effect size of 50%. A thorough history and physical examination was performed. After clinical evaluation, patients were accepted as having functional dyspepsia if there was no evidence of an organic disease. The diagnosis of FD was made based on a thorough history, examination and by clinical judgment, the presence of alarm signs, and a selection of the appropriate tests based on response to treatment. Upper gastrointestinal system endoscopy was performed if the complaints persisted or relapsed after appropriate treatment, or if there were any alarm symptoms. Unfortunately, consent for endoscopy could not be obtained from all families. If there was gastritis, ulcer or *Helicobacter pylori* infection, the patient was accepted as having OD. The presence and duration of dyspeptic symptoms, other accompanying symptoms, and constipation were investigated. Appropriate management was arranged by a gastroenterologist. Patients were followed up for three months. The functional and organic dyspepsia groups were compared with regard to their demographic data, symptoms and QoL scores. Factors which affected the KINDL results and any change in the KINDL scores during follow-up were evaluated.

Disease appropriate treatment was given to each patient. If the patient was accepted as having FD, proton-pump inhibitors were prescribed to those patients with epigastric pain or burning predominantly. Prokinetic agents were given if there was early satiety or postprandial fullness. More frequent and smaller meals, and the avoidance of caffeine, fatty foods and spicy foods were recommended.

KINDL is a QoL scale used widely in children. It may show both the dimensions which are affected by the disease and the disease effect before and after treatment (7-9). It has different versions for 4-7 years, 8-12 years and 13-16 years of age. It contains six subscales and a total of 24 Likert-scaled items. These are physical well-being, emotional well-being, self-esteem, family, friends and school. Scores, which can vary between 0-100, are calculated for each subscale and for the total (10). Higher scores indicate a better QoL. The Turkish validated version of this scale was used in our study (11). The KINDL questionnaire was applied at their first referral and at the first-month and third-month visits.

Written informed consent was signed by the parents or caregivers who were the legal guardians of each participant.

Statistical Analysis

SPSS (Statistical Package for Social Sciences) 22.0 for Windows program was used for statistical analysis. Significance was accepted as $p<0.05$. The mean, standard deviation and percentage distribution data were used for descriptive data and KINDL scores. The chi-squared test was applied for comparison of alarm symptom distribution and school absenteeism. Independent-samples t-test was used to compare the total KINDL scores and the factors affecting the KINDL scores. Analysis of variance was used for repeated measures in the comparison of the total scores during the follow-up of each group. Ethical approval was obtained from Dr. Behçet Uz Pediatric Diseases and Surgery Training and Research Hospital Ethics Committee on April 9th, 2015 (no: 2015-7229).

Results

During the study period, 214 patients with dyspepsia were admitted into the gastroenterology outpatient clinic. The study group consisted of 136 patients who were eligible and agreed to participate in this study. Of these, 71 were assigned to the FD group and 65 to the OD group. All of the participants completed the study. There were 97 girls

(71.3%) and 39 boys (28.7%). The mean age of the patients in the study was 12.7±3.3 years. The mean age of the OD group was higher (13.8±2.6 years vs. 11.5±3.6 years, p<0.01). There was no gender difference between the two groups (p>0.05). Table I shows symptom distribution and mean duration of complaints in the OD and FD groups. The mean duration of symptoms was similar in both groups (p>0.05). Symptom rates were not different between the OD and FD groups (p>0.05). School absenteeism was also similar (52.3% vs. 49.3%, p>0.05).

Upper gastrointestinal endoscopy (UGE) was performed in 38 (27.9%) patients in the OD group. Of these, 14 patients had severe gastritis according to macroscopic and microscopic findings. One patient also had esophagitis.

The mean scores of the physical well-being and school dimensions were higher in the FD group than that of the OD group (p<0.05). There were no differences between the two groups in the friends, emotional well-being, self-esteem and family dimensions (p>0.05). The mean total score was higher in the FD group in comparison to the OD group (63.9±14.0 vs. 58.7±12.1, p<0.05) (Table II).

Table I. Duration of symptoms in the organic and functional dyspepsia groups

Symptoms (n)	Symptom duration (month) (mean±SD)	p-value
Abdominal pain Functional dyspepsia (71) Organic dyspepsia (65)	 12.1±9.9 14.8±13.9	0.183
Nausea Functional dyspepsia (48) Organic dyspepsia (42)	 11.5±9.4 12.3±12.1	0.723
Bloating Functional dyspepsia (40) Organic dyspepsia (36)	 11.6±8.8 10.7±11.5	0.695
Flatulence Functional dyspepsia (39) Organic dyspepsia (29)	 10.4±9.2 13.4±13.2	0.283
Vomitting Functional dyspepsia (25) Organic dyspepsia (23)	 10.1±10.6 8.3±8.8	0.511
Heartburn Functional dyspepsia (36) Organic dyspepsia (37)	 12.5±10.0 11.3±11.0	0.628
Constipation Functional dyspepsia (7) Organic diyspepsia (3)	 10.1±3.2 16.0±7.0	0.092
Stress Functional dyspepsia (40) Organic dyspepsia (38)	 9.8±5.6 9.4±5.7	0.753
Regurgitation Functional dyspepsia (30) Organic dyspepsia (30)	 12.8±9.2 11.6±8.7	0.625

SD: Standard deviation

A negative correlation was observed between the initial KINDL total score and age in both the OD and FD groups (p<0.05). There was no significant relation between gender and the number of symptoms with respect to the KINDL scores (p>0.05).

The mean scores of the self-esteem, family, school, and friends subscales and the mean total score were higher in the FD group compared to the OD group at the first month visit (p<0.05). There was no difference between the groups in terms of physical well-being (p>0.05) (Table II).

The mean score of self-esteem was higher in the FD group (p<0.05). However, there was no difference between the two groups in terms of the physical well-being, emotional well-being, friends, family and school dimensions at the third month visit (p>0.05, Table II).

During the follow-up, the total QoL scores gradually increased in both groups (Figure 1). There was no difference between the groups in terms of the mean third month total scores (p>0.05). The first and last KINDL scores were significantly different in both groups (p<0.01). However, a higher increase was observed in the OD group compared to the FD group.

Dyspepsia improved in 88 (64.7%) patients while complaints continued in the rest. The KINDL scores in the physical well-being (21.3±3.1 vs. 18.4±2.0) and friends (17.6±2.5 vs. 15.8±1.7) dimensions were higher in those patients whose complaints still persisted during the final visit (p=0.010 and p=0.015, respectively). The final school dimension (19.1±2.1 vs. 18.7±2.8) and the total KINDL scores (11.4±1.2 vs. 10.7±1.5) were higher in those patients whose dyspepsia was resolved (p=0.004 and p=0.001, respectively).

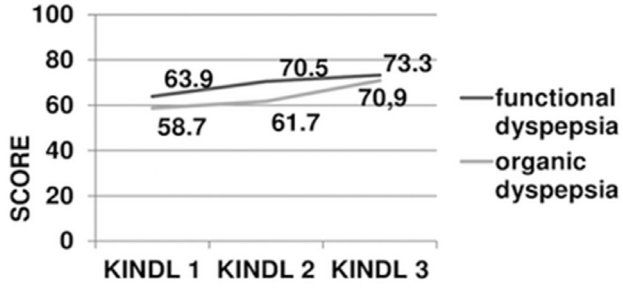

Figure 1. The KINDL total scores in organic and functional dyspepsia groups during follow-up

Discussion

Functional and organic gastrointestinal diseases have a negative impact on QoL. This effect may be more prominent in functional diseases (12,13). However, little is known about QoL after treatment.

Dyspepsia includes symptoms such as early satiety, abdominal pain, epigastric discomfort and postprandial fullness (1,2). Only one third of dyspeptic patients have an underlying organic disorder. This group is classified as OD (1). The rest of the patients have FD. Abdominal pain related functional gastrointestinal disorders are mostly seen in females (14,15). In OD, there is no difference between genders (16,17). Girls constituted the majority of both groups in our study. The mean age of the patients in this study was similar to ages reported in other studies (18,19).

The cause of dyspepsia did not have an impact on the duration or frequency of the dyspeptic complaints. There was no difference between the two groups in terms of dyspeptic symptom rates either. Therefore, we suggest that although there are no organic reasons, complaints in FD might be more frequent and longer lasting, which will affect the QoL.

Gastrointestinal complaints affect children's lives in many different ways. School absenteeism is one of them. School absenteeism is more common in both organic and functional gastrointestinal diseases compared to healthy children. However, in functional and organic gastrointestinal diseases, school absenteeism has been reported at similar rates (20). We also did not note any difference between OD and FD in terms of school absenteeism.

Studies have shown that QoL is affected more in functional gastrointestinal diseases than in organic gastrointestinal diseases (6,12,13,20). In our study, QoL scores were low in both the OD and FD groups. This effect was more prominent in dyspepsia with organic causes. The difference was particularly evident in the physical well-being and school dimensions. We suppose that the complaints of the OD patients may be more severe in our population.

A negative correlation was observed between the initial KINDL total score and age in both groups. It is assumed that as patients grow older, complaints are better perceived and the questions are answered more precisely.

The KINDL scores at the first month visit show that the OD group was still affected more. This effect was present in all dimensions except for the physical well-being dimension. Patients responded similarly after one month of treatment. Except for the physical well-being dimension, as it is a

Table II. KINDL scores at referral, first and third month visits

	Referral		**First month visit**		**Third month visit**	
	Mean±SD	**p-value**	**Mean±SD**	**p-value**	**Mean±SD**	**p-value**
Physical well-being Functional dyspepsia Organic dyspepsia	50.0±25.4 39.9±17.3	**0.008**	60.8±24.3 53.8±19.8	0.066	70.0±23.1 74.3±15.5	0.204
Emotional well-being Functional dyspepsia Organic dyspepsia	67.8±18.3 64.1±20.3	0.272	73.5±18.8 66.8±20.6	0.050	77.2±17.4 79.7±15.5	0.377
Self-esteem Functional dyspepsia Organic dyspepsia	59.4±23.0 52.3±25.5	0.090	66.1±22.7 54.2±22.5	**0.003**	70.2±20.2 59.3±18.9	**0.001**
Family Functional dyspepsia Organic dyspepsia	77.6±22.0 73.6±20.9	0.281	81.3±18.5 74.0±17.7	**0.020**	80.0±17.1 79.2±16.2	0.062
Friends Functional dyspepsia Organic dyspepsia	71.0±21.7 72.0±17.4	0.753	78.8±16.3 67.2±18.4	**<0.001**	80.0±17.1 76.3±16.3	0.203
School Functional dyspepsia Organic dyspepsia	56.8±23.0 48.6±21.7	**0.045**	60.9±22.4 52.5±18.5	**0.025**	56.4±21.6 53.9±16.8	0.467
Total score Functional dyspepsia Organic dyspepsia	63.9±14.0 58.7±12.1	**0.022**	70.5±14.8 61.7±12.8	**<0.001**	73.3±12.6 70.9±10.3	0.215

KINDL: The Kinder Lebensqualität Fragebogen, SD: Standard deviation

more objective finding, we observed improvements in the other dimensions over time. In another study in which the Pediatric Quality of Life scale was used, it was seen that physical health, social functions and school functions were lower in those patients with functional gastrointestinal diseases in comparison to those patients with organic diseases (12). This difference may be due to the different scales used and the social characteristics of the patients in that study. At the third month visit, the difference in the QoL total scores between the functional and organic dyspepsia groups had disappeared. The difference in the subgroup of self-esteem might have been influenced by the current mood of the patients.

A continuous increase was observed in the QoL scores in the OD and FD groups during follow-up. There are many studies about the effects of functional and organic gastrointestinal diseases on QoL. However, there is only one study about the effects during follow-up. That study revealed improvements in the QoL scores of patients with FD in the initial, first and third month visits after treatment (20). Similar increases in the QoL scores were observed in our study. While a gradual increase and significant improvement was observed in the FD group at each follow-up visit, the OD group presented a more distinct improvement after the first month. The improvements in the QoL scores in the follow-up visits indicate that the recommendations and treatment given had successful outcomes.

Improvement in the physical well-being and friends dimensions were significant even in those patients whose complaints persisted. This may indicate that even when there is no complete improvement in complaints, the quality of life may improve due to the proper recommendations. Improvements in complaints led a better QoL in the school dimension. When the total scores were analyzed, QoL improved after treatment in line with recovery as expected.

Study Limitations

This study has some limitations. Firstly, UGE was not performed on all patients, therefore, we might have missed an organic pathology. However, it is an invasive procedure and it is not mandatory in the diagnosis of functional diseases. UGE was recommended in the presence of dysphagia, persistent symptoms or recurrent symptoms after the cessation of drugs (2). We performed UGE in all cases with these recommended indications. The second limitation regards the treatment of FD. There is no one and only proven therapy for functional gastrointestinal diseases. Avoidance of some medications and foods, antisecretory agents and prokinetics may be given according to clinical symptoms (2,21). Tricyclic antidepressants may be recommended in anxious children (3). We treated these patients according to their predominant symptoms and the recommendations in the literature.

Conclusion

Our study showed that the QoL of patients with both functional and organic dyspepsia was positively affected. Therefore, we suggest that appropriate recommendations and treatments should be provided as these may increase QoL. We observed favorable results when OD patients were treated according to their underlying disease. Treatment is important in both disease groups and QoL scales can be used during follow-up to monitor treatment response.

Ethics

Ethics Committee Approval: Ethical approval was obtained from Dr. Behçet Uz Pediatric Diseases and Surgery Training and Research Hospital Ethics Committee on April 9th, 2015 (no: 2015-7229).

Informed Consent: Written informed consent was signed by the parents or caregivers who were the legal guardians of each participant.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Concept: E.K.T., O.T., İ.G., Design: E.K.T., O.T., İ.G., Data Collection and/or Processing: E.K.T., O.T., İ.G., Analysis and/or Interpretation: İ.G., E.E., Literature Search: E.E., O.T., Writing: E.K.T., Ö.B.S., O.T., İ.G., E.E.

Conflict of Interest: The authors declared that there were no conflicts of interest.

Financial Disclosure: The authors declared that this study has received no financial support.

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