

## ⇒ Research Article



# Quality of Life in Children With Chronic Functional Constipation and Their Family Members

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## Abstract

**Background:** Functional constipation (FC) is one of the most common complaints in childhood. The aim of this study was the evaluation of the quality of life in children with chronic FC and their family members.

**Methods:** In this study, 100 children from 2-18 years of age (57 males, 43 females) with chronic FC were selected. The Child Health Questionnaire - Parent Form 50 questionnaire was used for quality of life assessment in children and their family members. Quality of life scores were compared with 100 healthy children from 2-18 years of age. The questionnaire consists of 15 domains, each of which ranges in score from zero to 100. A higher score represents a better quality of life.

**Results:** Quality of life scores in all 15 domains were significantly lower in children with FC than in healthy children ( $P < 0.001$ ). Scores of physical functioning, behavior, and mental health were lower in children with FC and fecal incontinence compared to children with FC alone ( $P < 0.05$ ).

**Conclusion:** FC impacts on quality of life of the affected children and their family members. Practitioners should be aware of its effects on quality of life to improve the disease course with early assessment and treatment.

**Keywords:** Constipation, Quality of life, Children

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## Background

Constipation and fecal incontinence are common concerns in childhood (1). Fecal incontinence, also known as fecal soiling, is among one of the most encountered complications of prolonged constipation (2). In less than 15% of children with fecal incontinence who represent no evidence of constipation, the clinical investigation will reveal underlying constipation (1). In a study in the United States, the quality of life of the children with chronic constipation was lower in social and affectional aspects in comparison with the patients with inflammatory bowel disease and esophagus reflex (3). Also, in the study of Wang et al, which was conducted in China in 2013, children with chronic functional constipation (FC) revealed a poorer quality of life in mental, physical, social, and educational aspects compared to healthy counterparts (4).

Also, the families of children with FC had low quality of life scores in mental, physical, social, cognitive, and communicational dimensions (4). A recent systematic review and meta-analysis on 2344 children with FC verified a compromised quality of life in these children (5). This finding was also supported in a study on the quality of life of children with FC in Australia, in which poorer quality of life in both psychological and physical

aspects with a more pronounced decline in mental and psychological dimensions was reported (6). Faleiros and Machado in their study in Brazil, reported that mean quality of life scores of the patients with chronic FC were 26.3 and 36 in physical and psychological aspects, while these scores were 55 and 53 in healthy children, respectively (7). Also, Clarke et al found a lower quality of life score in children with FC in comparison with the control group (6). In another study in Rajindrajith et al, children with constipation had reduced quality of life scores in all physical, social, emotional, and educational dimensions. In comparison with them, poorer scores were found in those suffering from fecal incontinence, severe abdominal pain, and gastrointestinal symptoms (8).

Furthermore, the results of some studies showed depression, anxiety, focus problems, social, behavioral disturbances, poor educational function, poor family function, anxiety, and lower psychosocial function in children with fecal incontinence compared to the children without fecal incontinence (9-11). In one of these studies, in prolonged cases of constipation which persisted until adulthood, communicational problems were noted in 20% of the patients (10). Additionally, older children with chronic FC and fecal incontinence represented a poorer quality of life in comparison with

their younger counterparts (11). Moreover, in a study carried out by Kianifar et al. in Iran, children with FC showed emotional disturbance (12). In a systematic review by Iraj et al. pooling the investigations of 10 different Iranian provinces, the authors reported that the frequencies of constipation and FC were 1.4-37% and 2.4%-11%, respectively (13).

### Objectives

Considering the high prevalence of FC in Iran, it is important to assess the quality of life of these patients. So, here we aimed to address this issue in a sample population of children with FC.

### Material and Methods

All children from 2-18 years of age with constipation admitted to Imam Reza pediatric gastroenterology clinic in Shiraz from March 2016 to February 2017 were included. After primary physical examination, 100 children diagnosed with FC according to the Rome III criteria were randomly selected. According to Faleiros and Machado (7) and considering the values of  $\alpha = 0.01$ ,  $d = 17.2$ , power of 99% ( $\beta = 0.01$ ), and estimating a withdrawal rate of 20%, the minimum sample size was calculated to be 30 for each control and case group. Finally, 100 children were included in each group.

$$n_1 = n_2 = \frac{(Z_{1-\alpha/2} + Z_{1-\beta})^2 (s_1^2 + s_2^2)}{d^2}$$

According to the Rome III criteria, in order to diagnose a person with FC, two or more of the following criteria must be fulfilled for at least one month. In children < 4 years old, the items included: (a) two or fewer defecation episodes per week, (b) history of prolonged fecal retention, (c) history of painful intestinal movements, (d) the presence of a large fecal mass in the rectum, (e) history of fecal mass with large diameter blocking up the toilet, (f) additional criteria: not meeting irritable bowel disease criteria. The diagnostic criteria for children > 4 years old were the presence of two or more of the following items for at least one time per week, lasting in at least a two-month period of time. The items included (a) fecal defecation two or fewer times per week, (b) fecal incontinence at least one time per week, (c) history of prolonged fecal retention, (d) history of painful intestinal movements, (e) the presence of a large fecal mass in the rectum, (f) history of fecal mass with large diameter blocking up the toilet, (g) additional criteria: not meeting irritable bowel disease criteria (1).

The healthy children were children with no history of gastrointestinal diseases, all of whom were recruited from kindergartens and schools. One hundred age- and sex-matched children were randomly selected. Children with Hirschsprung disease, muscular disorders, history of surgical procedures on the rectum, spina bifida,

mental retardation, hypothyroidism, chronic asthma, cardiovascular and renal diseases, cancer, seizure, chronic allergy, diabetes, skeletal, bone, and joint abnormalities, growth retardation, psychological problems such as autism, depression, anxiety, and sleep disorders, auditory, visual, and verbal problems were excluded. Furthermore, children whose parents had difficulties comprehending Persian or the questions, as well as those who were illiterate or not willing to participate, were not entered in the study. Finally, parents experiencing emotional inflicts such as loss of beloved ones during the past six months were also excluded. The participants were categorized into two age groups, including preschool children (aged 2-6 years old) and school children (aged 7-18 years old). The Child Health Questionnaire – Parent Form 50 (CHQ-PF 50) was used in the present study. We had previously validated the questionnaire. The questionnaire was completed by an experienced gastroenterologist by interviewing the parents. The tool comprised of 50 questions organized in 15 sections, including Physical Functioning (PF), Role/social Health Perception (RP), General Health Perception (GH), Bodily Pain (BP), Role/social – Emotional/Behavioral (REB), Self Esteem (SE), Mental Health (MH), Behavior (BE), Parental Impact-Emotional (PE), Parental Impact- Time (PT), General Behavior (GBE), Change in Health (CH), Family Activity (FA), Family Cohesion (FaC), and General Global Health (GGH).

The scores were assigned from zero to 100 according to the instructions of a textbook entitled “Child Health Questionnaire; A user Manual” (14). Higher scores indicated better quality of life.

Statistical analyses were performed using Statistical Package for the Social Sciences (SPSS) version 22.0 software package, applying independent samples student *t* test (or its non-parametric counterpart; Mann-Whitney U test), chi-squared or Fisher’s exact test, and Pearson and Spearman correlation tests.

### Results

This study was performed on 100 children with chronic FC and 100 healthy children from 2-18 years of age (Table 1). The Frequency distribution of clinical symptoms of studied children is indicated in Table 2.

The mean scores for different quality of life aspects among healthy children and those with chronic FC are represented in Table 3. Significant differences in all aspects (in both facets of physical and psychosocial health function) were found in both groups, with lower scores in children with FC.

Considering the association between quality of life dimensions and demographic variables, children in the age group of 7-18 had better performance than those aged between two and six in the FA dimension (*P* value = 0.03). Sex was significantly associated with GGH, PF, and CH

**Table 1.** Characteristics of Healthy Children and Those With Chronic Functional Constipation

Characteristics	Functional Constipation (n = 100)	Healthy (n = 100)
Gender (male, %)	57	56
Age (years)		
2-6	61	58
7-18	39	42
First child (%)	66	64
Symptoms period (months, mean ± SD) <sup>8</sup>	25.19 ± 12.5	-
Occupation (%)		
Unemployed	16	6
Full time or part-time employee	16	36
Housewife	68	58
Parents' education		
Lower diploma	23	12
Diploma	44	44
Academic education	33	44
Parents' age (mean ± SD)	34.35 ± 5.14	33.86 ± 6.2
Parents' gender (female, %)	95	82

**Table 2.** The Prevalence of Symptoms Associated With Constipation in Studied Children

Symptoms	Percent
Anorexia	63
Perianal erythema	50
Fecal mass	55
Withholding behavior	72
Rectal bleeding	29
Anal pruritus	41
Halitosis	58
Abdominal pain	85
Soiling	40

dimensions, and girls showed a higher quality of life in these dimensions ( $P = 0.01, 0.02,$  and  $0.04,$  respectively). Being firstborn or not was only associated with the REB dimension in which first children showed a significantly lower quality of life ( $P = 0.04$ ). There were no significant associations with these variables and other quality of life dimensions.

In our study, children with soiling showed significantly lower performance in PF, BE, and MH in comparison with their counterparts with no evidence of soiling (Table 4). Children with FC had a significantly lower quality of life in the domain of REB, while other domains were not impacted. The association between quality of life and abdominal pain is depicted in Figure 1. Besides, the correlation between the quality of life and duration of symptoms in children with chronic FC is demonstrated in Table 5. There were significant negative correlations between symptoms duration and quality of life in GGH,

PF, BE, CH, and PE aspects.

## Discussion

The health-related quality of life has been known as a primary and vital assessment in clinical settings since 1993 (15, 16). In the present study, all quality of life aspects were inferior in children with chronic FC in comparison with the healthy children, which is in line with the reports of Wang et al.(4) and Clarke et al (6). According to Faleiros and Machado (7), who used the CHQ-PF 50 questionnaire, all dimensions of quality of life, except the CH dimension, were lower in children with FC in comparison with the healthy children. Furthermore, in

**Table 3.** Comparison of Quality of Life Dimensions Between Children With Chronic Functional Constipation and the Healthy Counterparts

Qualification of Life	Groups	Mean	SD	P Value
GGH	Healthy	90.95	10.24	<0.001
	FC	40.8	26.32	
PF	Healthy	98.01	6.94	<0.001
	FC	81.11	25.99	
REB	Healthy	97.11	8.22	<0.001
	FC	81.2	26.19	
PR	Healthy	98.42	6.09	<0.001
	FC	80.3	17.33	
BP	Healthy	88	11.34	<0.001
	FC	46.5	69.06	
BE	Healthy	84.8	12.89	<0.001
	FC	49.01	23.36	
GBE	Healthy	85.05	12.74	<0.001
	FC	42.11	25.78	
MH	Healthy	84.44	13.37	<0.001
	FC	52.04	19.47	
SE	Healthy	92.85	12.31	<0.001
	FC	67.24	17.9	
GH	Healthy	90.9	10	<0.001
	FC	40.62	17.39	
CH	Healthy	84	17.95	<0.001
	FC	35.5	18.18	
PE	Healthy	86.5	12.76	<0.001
	FC	45.39	55.06	
PT	Healthy	90.81	10.56	<0.001
	FC	50.28	23.42	
FA	Healthy	90.27	10.91	<0.001
	FC	49.12	23.47	
FaC	Healthy	82.95	12.51	<0.001
	FC	46.95	24.77	

Abbreviations: Functional Constipation (FC), Physical Functioning (PF), Role/social Health Perception (RP), General Health Perception (GH), Bodily Pain (BP), Role/social – Emotional/Behavioral (REB), Self Esteem (SE), Mental Health (MH), Behavior (BE), Parental Impact- Emotional (PE), Parental Impact- Time (PT), General Behavior (GBE), Change in Health (CH), Family Activity (FA), Family Cohesion (FaC), and General Global Health (GGH).

**Table 4.** The Association Between Soiling and Quality of Life in Children With Chronic Functional Constipation

Qualification of Life	Soiling	Mean	SD	P Value
GGH	Present	40.37	26.56	0.896
	Absent	41.08	26.38	
PF	Present	72.9	29.23	0.014*
	Absent	86.58	22.20	
REB	Present	76.68	33.09	0.21
	Absent	84.04	20.13	
PR	Present	78.59	21.74	0.46
	Absent	81.45	13.71	
BP	Present	37.84	25.36	0.30
	Absent	52.27	86.57	
BE	Present	43.25	23.58	0.043*
	Absent	52.85	22.59	
GBE	Present	38.02	26.60	0.19
	Absent	44.83	25.07	
MH	Present	45.39	19.58	0.003*
	Absent	57.09	18.07	
SE	Present	62.42	23.25	0.05
	Absent	70.45	12.38	
GH	Present	38.69	18.31	0.36
	Absent	41.90	16.78	
CH	Present	35	17.72	0.82
	Absent	35.83	18.62	
PE	Present	51.09	84.55	0.48
	Absent	41.57	18.01	
PT	Present	47.13	25.13	0.27
	Absent	52.37	22.19	
FA	Present	44.28	26.77	0.09
	Absent	52.35	20.59	
FaC	Present	44.37	26.14	0.39
	Absent	48.66	23.87	

Abbreviations: Physical Functioning (PF), Role/social Health Perception (RP), General Health Perception (GH), Bodily Pain (BP), Role/social – Emotional/Behavioral (REB), Self Esteem (SE), Mental Health (MH), Behavior (BE), Parental Impact- Emotional (PE), Parental Impact- Time (PT), General Behavior (GBE), Change in Health (CH), Family Activity (FA), Family Cohesion (FaC), and General Global Health (GGH).

\* Statistically significant at  $P < 0.05$ .

Youssef et al (3) research, parents of children affected with FC reported lower psychosocial quality of life scores than parents with healthy children. Here, we noted that all aspects of quality of life showed to be lower in the parents of children with FC, which may be due to negligence of the diseases by them and, therefore, delayed seeking of medical care leading to progression of the disease and reduced quality of life. Our results revealed a significant relationship between the quality of life of children with FC and abdominal pain. Accordingly, the children with abdominal pain represented poorer quality of life in physical and other dimensions related to the family

performance (i.e., emotional impacts on parents, family activities, and coherence). In Rajindrajith et al study (8), the researchers also found an inverse link between abdominal pain intensity and quality of life score. This was also observed by Wang et al (4), who described deterioration in the quality of life status in those with abdominal pain. Also, in Youssef et al study, parents of constipated children who also had abdominal pain reported lower emotional quality of life scores. In some studies, abdominal massage was shown to significantly improve the quality of life the patients suffering from constipation (17, 18). This claim is consistent with our findings. This observation may be rooted in the parents' worries regarding organic causes of abdominal pain, which might engage them emotionally and, therefore, impact their perceptions of the quality of life of their children.

There was a significant inverse association between the length of symptoms and the scores of seven aspects of quality of life, which was also shown by Youssef et al (3) and Wang et al (4). In another study and in support of our observation, the presence of intestinal symptoms was associated with poor quality of life in patients with chronic constipation (19). Likewise, irritable bowel syndrome (IBS) patients with digestive symptoms were reported to have a reduced quality of life which highlights the significant impact of this parameter on quality of life of these patients (20).

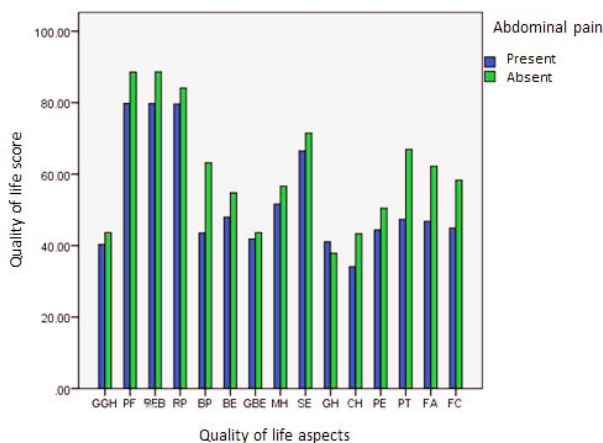
The mean duration of symptoms was 25.12 months in our study. This rather long period before seeking medical

**Table 5.** The Correlation Between the Quality of Life and Duration of Symptoms in Children With Chronic Functional Constipation

Quality of Life Aspects	Correlation Coefficient	P Value
FaC	0.138	0.172
FA	- 0.097	0.339
PT	0.053	0.601
PE	- 0.250	0.012*
CH	- 0.343	0.001*
GH	- 0.200	0.04*
SE	- 0.059	0.56
MH	- 0.28	0.004*
GBE	- 0.142	0.15
BE	- 0.27	0.006*
BP	- 0.07	0.48
RP	0.016	0.87
REB	- 0.018	0.86
PF	- 0.20	0.04*
GGH	- 0.25	0.012*

Abbreviations: Physical Functioning (PF), Role/social Health Perception (RP), General Health Perception (GH), Bodily Pain (BP), Role/social – Emotional/Behavioral (REB), Self Esteem (SE), Mental Health (MH), Behavior (BE), Parental Impact- Emotional (PE), Parental Impact- Time (PT), General Behavior (GBE), Change in Health (CH), Family Activity (FA), Family Cohesion (FaC), and General Global Health (GGH).

\*Statistically significant at  $P$  value  $< 0.05$ .



**Figure 1.** The Relationship Between Quality of Life and Abdominal Pain in Children With Chronic Functional Constipation. Abbreviations: Physical Functioning (PF), Role/social Health Perception (RP), General Health Perception (GH), Bodily Pain (BP), Role/social – Emotional/Behavioral (REB), Self Esteem (SE), Mental Health (MH), Behavior (BE), Parental Impact-Emotional (PE), Parental Impact- Time (PT), General Behavior (GBE), Change in Health (CH), Family Activity (FA), Family Cohesion (FaC), and General Global Health (GGH).

treatment may be related to the children's unwillingness to defecate to avoid disputes with their parents and painful sequela, which in turn results in fecal retention (misinterpreted by the parents as a normal defecation effort) and finally delayed medical appointments.

In our study, 40% of the children with FC had fecal incontinence who represented the lower quality of life scores in physical, behavioral, and psychological aspects compared to the children without soiling. In Kovacic and colleagues' study (11), in which 55% of children with FC suffered from soiling as well, the overall quality of life score was lower in children with concomitant FC and soiling than those with FC alone. Nevertheless, in a recent study, there was no significant difference in the emotional, social, and educational performance of the children with or without soiling (11). Youssef et al, however, did not report any significant difference in the quality of life of FC children with or without soiling (3). In another study, children with FC and soiling showed lower scores of quality of life in all aspects compared to the counterpart children without this condition (8). The inconsistent results between our study and studies performed by others can be due to the fact that CHQ-PF 50 is a general scale with low specificity toward gastrointestinal symptoms.

Considering the role of sex, only one aspect of quality of life in the physical health dimension (i.e. PE) was lower in boys. On the other hand, no significant differences were noted in the six psychosocial parameters between boys and girls.

The family performance was lower in children with FC who were between two and six years old compared to those from 7-18 years of age. It is comprehensible that younger children require more care and surveillance than older children, and this can contribute to lower family

performance.

## Conclusion

Our findings showed that chronic FC greatly reduced all dimensions of quality of life. By educating parents regarding the signs of FC, it is possible to expedite diagnosis and improve their quality of life.

## Authors' Contribution

SMD: Concept, HS: Data collection, IS: Supervising, Critical revisions, AB: Drafting Manuscript, NH: Data collection, AM: Data analysis, AE: Data collection.

## Conflict of Interests

The authors declare that they have no competing interests.

## Ethical Approval

The study was approved by the Ethics Committee of Research Shiraz University of Medical Sciences (Code: ir.sums.med.rec.1395.s127).

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