

## Impact of Functional Constipation on Quality of Life in Children

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### Abstract

#### Background

Pediatric functional constipation (FC) is a common disease and may impair behavioral and psychological functioning and ultimately quality of life (QoL) in children. The aim of this study was to compare four aspects of emotional, social, physical and educational functioning of constipated children with their healthy peers by means of pediatrics health related quality of life questionnaires.

#### Materials and Methods

A total of 184 Iranian children aged 7-12 years, 92 with FC defined as ROME IV criteria referred to pediatric gastroenterology clinic of Rasoul-e-Akram Medical Center in Tehran, Iran, during Apr. 2016 to Dec. 2017 and 92 healthy children as control group, were enrolled in this case-control study. QoL in four aspects of physical, emotional, social and school functioning were assessed and compared in two groups of children with and without constipation.

#### Results

Mean age of children with and without functional constipation was  $9.49 \pm 1.76$  and  $9.49 \pm 1.43$  years, respectively. 61% (66.3) of constipated children, and 40% (43.5) of healthy ones were male ( $P=0.002$ ). There were statistically significant differences in mean QoL scores, as well as all four detailed aspects of QoL between children with and without FC ( $P < 0.001$ ).

#### Conclusion

FC in children aged 7-12 years may impair all four aspects of QoL, so early diagnosis and adequate medical treatment alongside behavioral therapy are necessary for successful outcome and promoting QoL in these patients.

**Key Words:** Children, Constipation, Quality of Life.

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## 1- INTRODUCTION

Functional constipation (FC) is known as a major problem in childhood with a prevalence range of 1 to 30% (median 10.4) worldwide (1). Although FC is rarely accompanied with life threatening complications, its impact on affected children may be considerable. These patients may have a significantly impaired quality of life, and also growth retardation compared with the unaffected population (2). The chronic nature of constipation, especially symptoms such as fecal incontinence, and painful excretion of feces may lead to behavioral and psychological problems in the child and family and adversely impact on the child's quality of life (QoL) in different aspects of emotional, physical, social and school functioning. The chronic course of FC and a maladaptive patient's family functioning may lead to loss of self-reliance, agitation, affective disturbances, deterioration of coping skills, school refusal (3-6).

Study on QoL in adults and children affected by chronic gastrointestinal problems has been performed in some countries. But, to our knowledge, the impact of FC on QoL of children has not been well studied in affected population of school children in Iran. So, authors designed this study to evaluate the impact of QoL on Persian elementary school children, so as to provide scientific evidences for improving different aspects of QoL, by seeking adequate and proper treatment. On the other hand, considering high prevalence of FC in children aged 7 to 12 years, and whereas, the achievement of a good quality of life has always been the authors' desire, the study results may affirm that early diagnosis and treatment of these patients should help to improve the QoL of affected children. Therefore, we aimed to compare four aspects of emotional, social, physical and educational functioning of constipated children with their healthy peers by means of pediatrics

health related quality of life questionnaires.

## 2- MATERIALS AND METHODS

### 2-1. Study design and population

This case-control study was conducted on a total of 184 Iranian children aged 7-12 years, 92 children as case group including all patients with functional constipation selected from patients referred to pediatric gastroenterology clinic of Rasoul-e-Akram Medical Center in Tehran, Iran, during Apr. 2016 to Dec. 2017. As well as 92 children as control group selected from the children's health care clinic clientele at the same hospital aged 7-12 years, simultaneously.

### 2-2. Inclusion and exclusion criteria

Authors used ROME IV classification for definition of FC as inclusion criteria: two or fewer defecations per week, at least one episode of incontinence per week, history of painful defecation, presence of fecal impaction in rectum, history of excessive volitional stool retention, and history of large diameter stools that might obstruct the toilet were diagnostic criteria. Presence of at least two criteria of those mentioned above for at least two months is diagnostic for FC in age group of children studied (7).

Children younger than 7 years old or older than 12 years were not included in this study. Constipated children in whom were detected any organic cause including Hirschsprung's disease, spina bifida, mental retardation, hypothyroidism, hypercalcemia, prior perianal surgery, and also growth abnormalities were excluded from the study. Furthermore, use of antiepileptic, antidepressant, antipsychotic drugs, anticholinergic agents and opioids were considered as exclusion criteria. Patients with other chronic diseases, and neuromuscular or neurodevelopmental disorders that might affect quality of life of children were excluded from the study, too.

### 2-3. Measuring tool

Patients in both constipated and healthy groups filled out the standard form of Persian pediatric quality of life questionnaire (PedsQoL) designed for elementary school children population aged 7 to 12 years. These questionnaires come with four sections: children's emotional, physical, social, and school functioning. Physical activity includes 8 questions and three other sections have 5 standard questions. The questions had 5 answers of never (zero), almost never (score 1), sometimes (score 2), often (score 3), and almost always (score 4), and they have been scored in a reverse manner, meaning zero scores 100 points, 1 scores 75 points, 2 scores 50, 3 scores 25, and 4 scores zero. The validity of the questionnaire has been determined for Persian elementary school children population by Akbari et al., and showed content validity of 0.84 for PedsQoL at all. The correlation coefficient between the PedsQoL and its subscales was acceptable ( $r=0.7$ ). Cronbach alpha coefficients of different categories of the tool ranged from 0.65 to 0.77. The questionnaire had proper internal consistency ( $\alpha=0.82$ ) (8).

### 2-4. Ethical considerations

The protocol of the study was approved by the Ethics committee of Iran University of Medical Sciences by ethical code number of IR.IUMS.REC 1395.9221216318 and conducted in accordance with the Helsinki Declaration. The design and objectives of the study were explained to all participants and written informed consent was obtained from those who were willing to participate in this study and it was clarified that their data would be kept confidential and analyzed anonymously.

### 2-5. Data Analyses

Statistical analysis was presented as mean  $\pm$  standard deviation (SD) for quantitative variables and as percentage for categorical qualitative ones. The comparison of variables between the two groups was done by t-test and Chi-square test or Fisher's exact test. P-value of 0.05 or less was considered statistically significant.

## 3- RESULTS

This study was performed on a total of 184 children aged 7 -12 years, of whom 92 had FC (case group) and 92 were healthy without constipation (control group). Baseline characteristics and some clinical features of two groups are summarized in **Table.1**.

**Table-1:** Baseline characteristics and Clinical Features in Children with and Without Constipation (n=184).

Variables	With constipation	Without constipation	P-value
Mean age	9.49 $\pm$ 1.76	9.49 $\pm$ 1.43	0.999
Male prevalence, no. (%)	61 (66.3)	40 (43.5)	0.002
Mean weight (kg)	23.12 $\pm$ 4.37	28.29 $\pm$ 6.12	0.001
Mean height (cm)	125.23 $\pm$ 10.92	139.88 $\pm$ 15.55	<0.001
Feces incontinence, no. (%)	42 (45.7)	2 (2.2)	<0.001
Allergy history, no. (%)	9 (9.8)	7 (7.6)	0.601

Mean QoL scores for children with constipation were compared with healthy non-constipated children in four aspects of physical, emotional, social, and school functioning. In terms of physical functioning, mean QoL scores in two

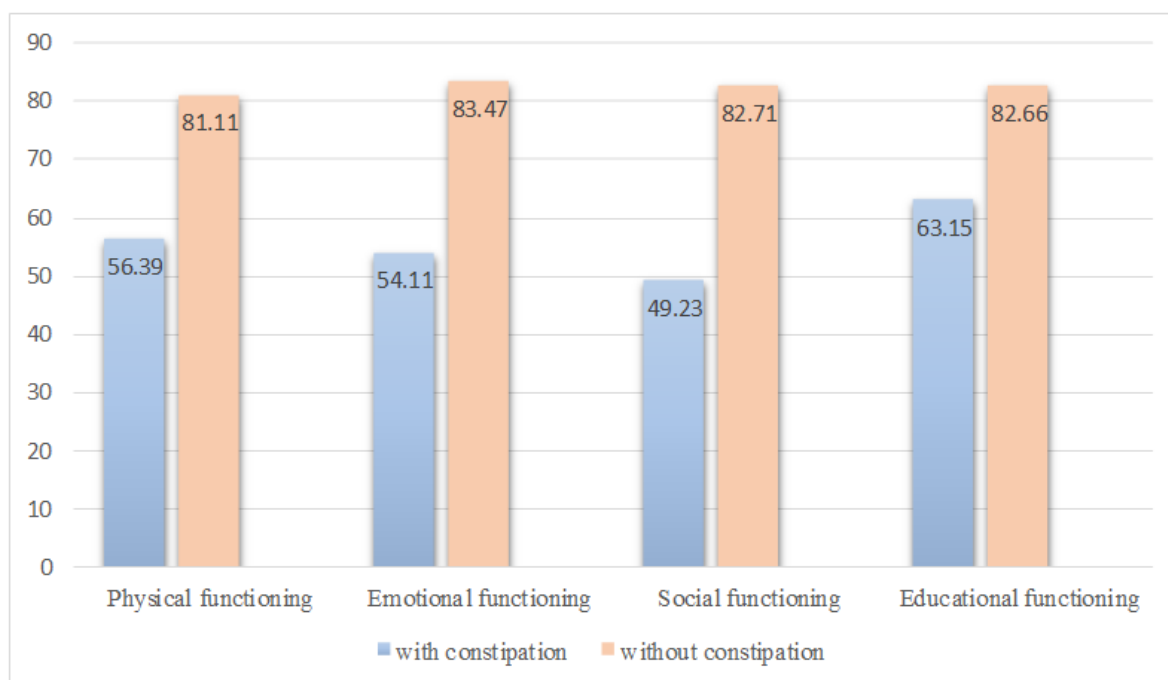
groups with and without FC were 56.39 $\pm$ 3.84 and 81.11 $\pm$ 4.96, respectively; and the difference was statistically significant ( $p<0.001$ ). Mean emotional functioning QoL scores in group of constipated patients were lower than the

control group,  $54.11 \pm 4.65$  against  $83.47 \pm 4.85$ , and a statistically significant difference was found between the two groups studied ( $p < 0.001$ ). Furthermore, mean social functioning QoL scores in constipated and healthy children were  $49.23 \pm 7.22$  and  $82.71 \pm 4.38$ , respectively; and a significant difference confirmed between these two groups ( $p < 0.001$ ). Also, mean school functioning QoL scores

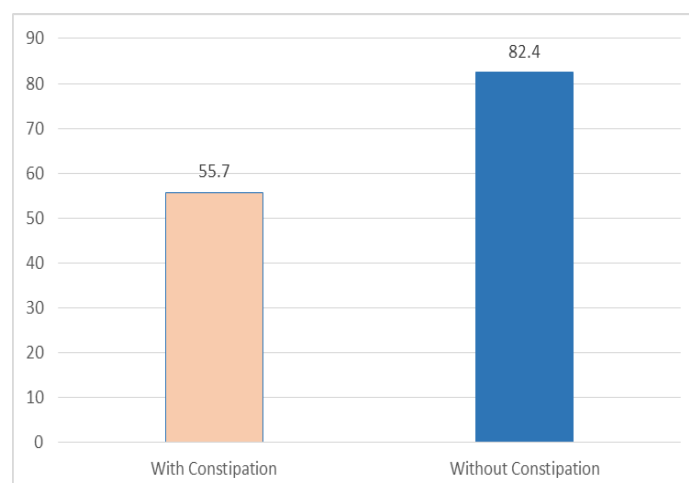
in children with and without FC respectively were  $63.15 \pm 3.97$  and  $82.66 \pm 6.15$ ; and  $p$ -value  $< 0.001$  demonstrated statistically significant difference. Totally, mean QoL scores in children with and without constipation were  $55.72 \pm 1.69$  and  $82.48 \pm 2.36$ , respectively; and a significant difference was found ( $p$ -value  $< 0.001$ ) (**Table.2, Figures.1, 2**).

**Table-2:** Comparison of quality of life of children with and without functional constipation (n=184).

Variables	With constipation	Without constipation	P-value
Physical functioning	$56.39 \pm 3.84$	$81.11 \pm 4.96$	$< 0.001$
Emotional functioning	$54.11 \pm 4.65$	$83.47 \pm 4.85$	$< 0.001$
Social functioning	$49.23 \pm 7.22$	$82.71 \pm 4.38$	$< 0.001$
Educational functioning	$63.15 \pm 3.97$	$82.66 \pm 6.15$	$< 0.001$
Quality of life score	$55.72 \pm 1.69$	$82.48 \pm 2.36$	$< 0.001$



**Fig.1:** Comparison of four aspects of quality of life of children with and without constipation (n=184).



**Fig.2:** Comparison of quality of life scores in children with and without constipation.

#### 4- DISCUSSION

Chronic and prolonged disorders not only impair daily physical functioning of patients, but also have adverse effects on their QoL including social, emotional, and even school/academic performance. FC in children is a common chronic problem, which may influence their growth status, as well as various parts of QoL (2, 9, 10). The aim of this study was to compare four aspects of emotional, social, physical and educational functioning of constipated children with their healthy peers by means of pediatrics health related quality of life questionnaires. The results of this study revealed that children suffering from FC aged 7 to 12 years had a significantly diminished functioning in all four aspects studied, including physical, social, emotional and school performance, compared with healthy group ( $p < 0.001$ ). These findings were generally similar to most of the previous studies (11-18), whereas, some researchers (12, 16) demonstrated that not all four aspects of physical and psychosocial functioning were negatively affected in constipated children. Ozakutan et al. found no behavioral problem in constipated children compared with control group (19). Cox et al. demonstrated that symptoms like anxiety and depression were more common in patients with constipation and

encopresis, and such symptoms were more severe in children who had more social problems, worse school qualifications, and poor family support (20). According to study performed by Yousef et al. in the United States, children with constipation had lower mean health related QoL scores and physical scores than healthy controls and children with gastroesophageal reflux disease (GERD), and inflammatory bowel disease (IBD) (16). In another study conducted in the Netherlands, young adults with constipation from early childhood were assessed, and no significant differences in health related QoL were found between adults with successful clinical outcome and the control group. However, adults with symptoms of constipation continuing from childhood reported significantly lower QoL scores compared to the control group. Those patients with an unsuccessful clinical outcome reported some problems in social contact and intimacy, and negative influences on quality of life (18). In a study conducted on patients with severe chronic constipation findings have revealed that such children avoid school toilet use due to fear of unacquainted toilets, which may result in constipation and therefore, quality of academic performance diminishes (21).

It seems that in spite of racial, economic, and cultural variations throughout the world, some degree of diminished QoL in children with chronic FC is consistently considerable. On the other hand, non-diagnosis and mismanagement of this common disorder may adversely affect all different aspects of QoL to adulthood. Clinical treatment alongside behavioral therapy for controlling symptoms of children with functional constipation may be an effective way of improving the QoL for a large number of children.

## 5- CONCLUSION

In conclusion, duration and characteristics of symptoms of FC adversely influence the quality of life of affected children in all four aspects of physical, emotional, social, and educational functioning, and it may be a source of family agitation. Therefore, early diagnosis and adequate medical and behavioral treatment is necessary for improving the QoL and successful outcome in Iranian Children attending elementary school.

## 6- ACKNOWLEDGEMENTS

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**7- CONFLICT OF INTEREST:** None.

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