

## Journal of Pediatric Gastroenterology & Nutrition:

July 2005 - Volume 41 - Issue 1 - pp 56-60

Original Articles: Gastroenterology

# Chronic Childhood Constipation Is Associated with Impaired Quality of Life: A Case-Controlled Study

**Youssef, Nader N; Langseder, Annette L; Verga, Barbara J; Mones, Richard L; Rosh, Joel R**



### Author Information

Center for Pediatric Functional Gastrointestinal and Motility Disorders, Goryeb Children's Hospital, Atlantic Health System  
Morristown, New Jersey

Received October 4, 2004; accepted April 8, 2005.

Address correspondence and reprint requests to Nader N. Youssef, Center for Pediatric Functional Gastrointestinal and Motility Disorders, Goryeb Children's Hospital, Atlantic Health System, 100 Madison Avenue Box -82, Morristown, NJ 07962. (e-mail: nader.youssef@ahsys.org).

Supported in part by the Joseph P. and Marguerite Goryeb research endowment to the Center for Pediatric Functional Gastrointestinal and Motility Disorders.



### Abstract

**Objective:** The objective of this study was to investigate the effect of chronic constipation on children's quality of life.

**Methods:** From October 2002 to November 2003, 224 children (140 male, 84 female, aged  $10.6 \pm 2.9$  years) and 224 parents were evaluated by a health related quality of life tool during initial outpatient consultation. Children with constipation ( $n = 80$ ) were compared with controls with inflammatory bowel disease ( $n = 42$ ), controls with gastroesophageal reflux disease ( $n = 56$ ), and with healthy children ( $n = 46$ ).

**Results:** Children with constipation had lower quality of life scores than did those with inflammatory bowel disease (70 versus 84;  $P < 0.05$ ), gastroesophageal reflux disease (70 versus 80;  $P < 0.05$ ), and healthy children (70 versus 88;  $P < 0.05$ ). Children with constipation reported lower physical scores than did inflammatory bowel disease patients (75 versus 85;  $P < 0.02$ ), gastroesophageal reflux disease patients (75 versus 85;  $P < 0.05$ ), or healthy children (75 versus 87;  $P < 0.05$ ). Parents of children with constipation reported lower scores than did their children (61 versus 70;  $P < 0.05$ ). Children with constipation had longer duration of symptoms than did the controls with inflammatory bowel disease and gastroesophageal reflux disease (43.8 months versus 14.2 months;  $P < 0.001$ ). Prolonged duration of symptoms for children with constipation correlated with lower parent-reported scores ( $P < 0.002$ ).

**Conclusions:** At initial evaluation, children with constipation have a lower quality of life than do children with inflammatory bowel disease or gastroesophageal reflux disease. Self-reported lower scores may be a reflection of impaired physical ability. Parental perceptions of low quality of life are probably impacted by the duration of their child's symptoms and by family members with similar complaints. Practitioners should be aware of the high level of parental concern and the relatively low self-reported and parent-reported quality of life in children with chronic constipation as they plan therapy.

## INTRODUCTION

Chronic constipation is one of the most common conditions encountered in general pediatric and pediatric gastroenterology offices and is associated with a great deal of underappreciated morbidity<sup>(1)</sup>. Chronic stool retention can contribute to recurrent abdominal pain and urinary tract pathology<sup>(2)</sup>. Fecal soiling occurs in 1.5% to 7.5% of school children 6 to 12 years of age<sup>(3)</sup>. Constipation may contribute significantly to abdominal pain complaints in adolescence<sup>(4)</sup>. The symptoms of chronic abdominal pain and fecal soiling may cause psychosocial difficulties, disruption of peer relationships and familial stress<sup>(5-7)</sup>. Long-term follow-up studies indicate that chronic constipation and associated complaints persist into adulthood in one third of patients<sup>(8)</sup>. Children with constipation may appear quiet, withdrawn, embarrassed and angry during medical evaluation compared with children with other chronic gastrointestinal disorders<sup>(9,10)</sup>. Denial of the symptoms is common in constipated children<sup>(11)</sup>. Despite these published observations, there have been no formal studies comparing the quality of life of children with chronic constipation and their families with children having other chronic gastrointestinal conditions and their families.

## SUBJECTS AND METHODS

After informed consent was obtained, the PedsQL™ (Pediatric Quality of Life Inventory) was administered by a research coordinator in a consecutive fashion at a tertiary pediatric care center to children and their parents in the waiting room as they were registering for their initial evaluation<sup>(12,13)</sup>. The PedsQL™, a health related quality of life tool, was administered before any encounter with the

physician (13). The inventory uses generic core scales derived both from child self-reports and parent proxy reports. The PedsQL™ has been validated in children as young as 5 years of age.

The 23-item PedsQL™ generic core scales encompass physical (eight items), emotional (five items), social (five items), and school functioning (five items). A 5-point response scale is used (0 = never a problem; 4 = almost always a problem). Items are reverse scored and linearly transformed to a zero to 100 scale (0 = 100, 1 = 75, 2 = 50, 3 = 25, 4 = 0) with higher scores indicating better health-related quality of life.

The PedsQL™ was read to children under age 7 by the research coordinator. Parents and their children completed the PedsQL™ separately. Separate reports are used because child self-reports are based on perceptions of internal states, whereas parent reports reflect the child's observable behaviors. It is often the parent's perception of a child's health status that influences health care use.

Study Population

All study patients were children presenting to a pediatric tertiary care center for evaluation of gastrointestinal complaints. Eligibility criteria for entry were a) age 5 to 18 years b) no organic cause of constipation, c) no reported attention deficit disorder, d) no reported cognitive delay and e) good comprehension of the English language. Additional healthy control subjects were recruited from a community-based general pediatric office where they were reporting for routine physical examinations or receiving care for minor acute medical problems. Criteria for chronic constipation included difficulty passing stools for >3 months (straining, grunting, stool getting stuck) and passage of fewer than 3 stools per week (14). During the study, 52 new patients with inflammatory bowel disease (IBD) were identified in our center. Ten of these patients already had an established diagnosis at the time of their initial visit to our center and had been referred for further evaluation and treatment. These 10 patients were not offered inclusion in the study. Gastroesophageal reflux disease (GERD) was defined as biopsy-proven inflammation of the esophagus associated with upper gastrointestinal symptoms.

Outcomes

The primary outcome measure of the study was quality of life in children with chronic constipation (the CONS group) for more than 3 months compared with healthy controls and children with other chronic gastrointestinal disorders with symptoms for more than 3 months. A secondary outcome measure included parental assessment of their child's quality of life. Additional outcome measures were the differences in perception in PedsQL™ between children and their parents.

Data Analysis

Gender, age, and standard error differences among patient groups (CONS, IBD, GERD and healthy controls) were analyzed by  $\chi^2$  test. Total quality of life scores were compared using independent sample *t* tests. All *P* values are two sided with *P* < 0.05 being considered as statistically significant.

The Institution Review Board of Atlantic Health System approved the study.

RESULTS

From October 2002 to November 2003, 224 children (140 male, 84 female, aged 10.6 ± 2.9 years) and 224 parents completed the PedsQL™ before the completion of their initial evaluation. Results from children with chronic constipation (CONS, n = 80) and parents were compared with control patients lacking evidence of chronic constipation. Included as controls were 42 children with IBD, 56 children with GERD and 46 healthy controls. The groups were similar in race, parental marital status and socioeconomic status.

The associated gastrointestinal symptoms of the study population and their duration are listed in Table 1. There was abdominal pain in 89% and fecal soiling in 29% of the CONS children. Family history of constipation was found in 40.2% of CONS versus 8.9% of controls (*P* < 0.05). Fifty-eight percent of CONS children had received no previous treatment for their symptoms despite their chronicity. Only 8% were receiving any treatment at time of evaluation. In the age groups evaluated, urinary incontinence was present in 3 of the 80 CONS patients. No case of Hirschsprung disease was subsequently diagnosed in any CONS patient.

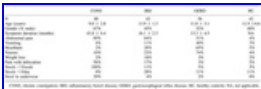


Table 1

Primary Outcome

Table 2 shows the patient self reported and parent proxy scores on the PedsQL™. CONS children had lower mean quality of life self-reported score (70) than children with IBD (84, *P* < 0.05), GERD (80, *P* < 0.05), and healthy controls (88, *P* < 0.05) (Fig. 1). CONS children reported lower mean physical score (75) than children with IBD (85, *P* < 0.02), GERD (85, *P* < 0.05), and healthy controls (87, *P* < 0.05). There was no difference in quality of life between CONS children with or without fecal soiling (70 versus 74, *P* = not significant) (Fig. 1). In the subgroup of children with soiling; there was no difference between the scores of those with and without abdominal pain (69 versus 74, *P* = not significant).

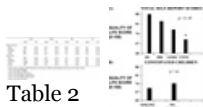


Table 2

Fig. 1

## Secondary Outcomes

CONS parents reported overall lower mean quality of life scores compared to their own children's self reported scores (61 versus 70,  $P < 0.05$ ) (Table 2). Parents of all children with abdominal pain reported lower mean perceived emotional score for their children compared to healthy control parents. The mean score of healthy controls was 83 compared to 55 in CONS ( $P < 0.001$ ), 64 in GERD ( $P < 0.05$ ) and 65 in IBD ( $P < 0.05$ ). In addition, CONS parents reported the lower mean emotional score (55) than GERD (64,  $P < 0.02$ ) and IBD (65,  $P < 0.02$ ). CONS parents reported lower perceived mean social score (67) compared to IBD parents (78,  $P < 0.02$ ), GERD parents (88,  $P < 0.001$ ) and healthy control parents (93,  $P < 0.001$ ). Duration of symptoms for CONS children was associated with lower mean parent reported scores ( $P < 0.002$ ) (Fig. 2).

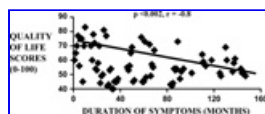


Fig. 2

## DISCUSSION

Health-related quality of life is an important outcome in clinical trials, clinical improvement strategies and population-based health assessment (15). In this study, children with chronic constipation had a lower self-reported quality of life than children with symptoms of IBD and GERD at time of initial evaluation. The impaired quality of life was not limited to patients but was also reported by their parents.

In our study there was no difference in mean overall quality of life score between children with and without fecal soiling. This refuted our suspicion that fecal soiling would be a leading factor in lower self-reported scores. Years of abdominal pain and painful defecation reported by 89% of CONS children may have been the factors leading to the impaired quality of life as reflected in the lower self-reported physical scores, which contained questions regarding ache or hurt. In contrast, only 50% to 66% of children with IBD and GERD reported abdominal pain at initial evaluation, with a much shorter duration of symptoms.

Although constipation is felt to be one of the most stigmatizing and least socially acceptable conditions in childhood and has been associated with lowered self-esteem (7), we found no differences in emotional scores between the children with and without soiling. This is possibly because the PedsQL™ is a generic measure of overall pediatric health (16-18). It is not designed as a specific gauge for intestinal disease. A more sensitive instrument may have appreciated differences.

Parents of constipated children reported lower perceived emotional and social scores for their children compared to parents of healthy children and those with other chronic gastrointestinal diseases. As the families had been dealing with constipation for more than 3-1/2 years, chronicity may be responsible for the low scores given by parents. Another factor contributing to the lowered parental perceptions of their children's quality of life may be the strong family history of constipation among the constipated children. Parents may have been influenced by their own experiences when completing the quality of life questionnaire, as 40% percent had a history of constipation themselves.

Our control children with IBD rated their quality of life as highly as healthy controls. Akobeng et al have reported on the negative impact that Crohn's disease has on children (19). In their study, lowered quality of life in children with Crohn's disease was attributed to depressive symptoms while on steroid therapy, fatigue, pain, unpleasant investigations and lack of understanding of Crohn's disease among friends, teachers, and medical professionals. In fact, their study focus group meetings revealed that children with Crohn's disease initially denied any effect on their lives at all (19). In our study, children's quality of life was measured at a point before a final diagnosis and before investigations and therapies had begun. Timing thus may explain the self-reported results by children. Symptoms present before referral may have been considered minor and consistent with recurrent viral illness. Conversely, parents of children with IBD did appreciate the effect on quality of life, as their scores were lower than those reported by parents of healthy controls.

It should be emphasized that our study defined chronic constipation as difficulty passing stools for >3 months with straining, grunting, or stool getting stuck and passage of stools <3 times/week. Whether our observations would be confirmed with a shorter duration of symptoms is unknown. Further limitations include lack of a control group with similar duration of symptoms to the CONS group. In this study the controls with IBD and GERD had a mean duration of symptoms that was greater than 1 year. Duration of symptoms included the time elapsed from initial symptoms and first evaluation by a primary care physician to the time they were referred to the pediatric gastroenterologist. It is not rare that there is a significant delay between the time the family first presents to the general physician and the time the complaint is referred to a gastroenterologist. Additional factors that may explain the prolonged duration of symptoms reported in our CONS patients include early-onset constipation, painful defecation, treatments involving anal manipulation, coercive toilet training practices and social stressors, all of which could lead to stool withholding and stool retention (20-22).

In summary, children with chronic constipation report an associated lower quality of life, both self reported and by parental assessment, compared with children with symptoms of IBD and GERD at time of initial evaluation to a pediatric gastroenterology office. Lower self-reported quality of life scores by children may be a reflection of associated abdominal pain and painful defecation. Lower perceptions by parents are most likely attributable to the duration of symptoms and family experience with constipation. Recognition of the lowered quality of life in these children and high level of parental concern should recommend more prompt management.

## REFERENCES

1. Loening-Baucke V. Chronic constipation in children. *Gastroenterology* 1993;105:1557-64.

2. Motta ME, Silva GA. Signs and symptoms associated with chronic constipation [in Portuguese]. *J Pediatr (Rio J)* 2000;76:222-6.
3. Loening-Baucke V. Factors determining outcome in children with chronic constipation and fecal soiling. *Gut* 1989;30:990-1006.
4. Hyams JS, Burke G, Davis PM, Rzepski B, Andrulonis PA. Abdominal pain and irritable bowel syndrome in adolescents: a community-based study. *J Pediatr* 1996;129:220-6.
5. Levine MD, Bakow H. Children with encopresis: a study of treatment outcome. *Pediatrics* 1976;58: 845-52.
6. Bornstein P, Balleweg B, McLellarn RW, et al. The bathroom game: A systemic program for the elimination of encopretic behavior. *J Behav Ther Exp Psychiatry* 1983;14:67-71.
7. Bellman, M. Studies on encopresis. *Acta Pediatr Scand* 1966;56:S1-151.
8. van Ginkel R, Reitsma J, Buller H, van Wijk MK, Taminiau JA, Benninga MA. Childhood constipation: Longitudinal follow-up beyond puberty *Gastroenterology* 2003;125:357-63.
9. Goh J, Byrne PJ, McDonald G, Stephens R, Keeling P. Severe juvenile chronic constipation. *Ir Med J* 2001;94:81-2.
10. Dawson P, Griffith K, Boeke K. Combined medical and psychological treatment for hospitalized children with encopresis. *Child Psychiatry Hum Dev* 1990;20:181-9.
11. Streeter BL. Teenage constipation: case study. *Gastroenterol Nurs* 2002;25:253-6.
12. Varni JW, Seid M, Rode CA. The PedsQL: measurement model for the pediatric quality of life inventory. *Med Care* 1999;2:126-39.
13. Varni JW, Seid M, Kurtin PS. PedsQL 4.0: reliability and validity of the Pediatric Quality of Life Inventory version 4.0 generic core scales in healthy and patient populations. *Med Care* 2001;8:800-12.
14. Rasquin-Weber A, Hyman PE, Cucchiara S, et al. Childhood functional gastrointestinal disorders. *Gut* 1999;45 (suppl 2)SII60-8.
15. Treurniet HF, Essink-Bot ML, Mackenbach JP. van der Maas PJ. Health-related quality of life: an indicator of quality of care? *Qual Life Res* 1997;6:363-9.
16. Seid M, Varni JW, Kurtin PS. Measuring quality of care for vulnerable children: challenges and conceptualization of a pediatric outcome measure of quality. *Am J Med Qual* 2000;15:182-8.
17. Varni JW, Burwinkle TM, Seid M, Skarr D. The PedsQL 4.0 as a pediatric population health measure: feasibility, reliability, and validity. *Ambul Pediatr* 2003;6:329-41.
18. Schwimmer JB, Burwinkle TM, Varni JW. Health related quality of life of severely obese children and adolescents. *JAMA* 2003;289:1813-9.
19. Akobeng AK, Suresh-Babu MV, Firth D, Miller V, Mir P, Thomas AG. Quality of life in children with Crohn's disease: a pilot study. *J Pediatr Gastroenterol Nutr* 1999;28:S37-9.
20. Brooks RC, Copen RM, Cox DJ, Morris J, Borowitz S, Sutphen J. Review of the treatment literature for encopresis, functional constipation, and stool-toileting refusal. *Ann Behav Med* 2000;22:260-7.
21. Borowitz SM, Cox DJ, Tam A, Ritterband LM, Sutphen JL, Penberthy JK. Precipitants of constipation during early childhood. *J Am Board Fam Pract* 2003;16:213-8.
22. Fishman L, Rappaport L, Schonwald A, Nurko S. Early constipation and toilet training in children with encopresis. *J Pediatr Gastroenterol Nutr* 2002;34:385-8.

#### Cited By:

This article has been cited **26** time(s).

#### Patient Education and Counseling

Chronic childhood constipation: A review of the literature and the introduction of a protocolized behavioral intervention program  
van Dijk, M; Benninga, MA; Grootenhuis, MA; Onland-van Nietwenhuizen, AM; Last, BF  
Patient Education and Counseling, 67(0): 63-77.

10.1016/j.pec.2007.02.002

[CrossRef](#)

#### Journal of Pediatrics

Health Utilization and Cost Impact of Childhood Constipation in the United States  
Liem, O; Harman, J; Benninga, M; Kelleher, K; Mousa, H; Di Lorenzo, C  
Journal of Pediatrics, 154(2): 258-262.

10.1016/j.jpeds.2008.07.060

[CrossRef](#)

#### Clinical Gastroenterology and Hepatology

A Randomized Controlled Trial of Enemas in Combination With Oral Laxative Therapy for Children With Chronic Constipation  
Bongers, MEJ; van den Berg, MM; Reitsma, JB; Voskuijl, WP; Benninga, MA  
Clinical Gastroenterology and Hepatology, 7(): 1069-1074.

10.1016/j.cgh.2009.06.018

[CrossRef](#)

Journal of Pediatrics

Health Related Quality of Life in Children with Constipation-Associated Fecal Incontinence

Bongers, MEJ; van Dijk, M; Benninga, MA; Grootenhuys, MA

Journal of Pediatrics, 154(5): 749-753.

10.1016/j.jpeds.2008.11.029

[CrossRef](#)

Indian Journal of Pediatrics

Management of Functional Constipation in Children

Srivastava, A

Indian Journal of Pediatrics, 75(): S48-S52.

Pediatrics

Rectal Fecal Impaction Treatment in Childhood Constipation: Enemas Versus High Doses Oral PEG

Bekkali, NLH; van den Berg, MM; Dijkgraaf, MGW; van Wijk, MP; Bongers, MEJ; Liem, O; Benninga, MA

Pediatrics, 124(6): E1108-E1115.

10.1542/peds.2009-0022

[CrossRef](#)

Wcpghan 3: World Congress of Pediatric Gastroenterology, Hepatology and Nutrition

Follow-up of Children with Chronic Functional Constipation: Impact of Treatment in the Physiopathology of the Disease

Torres, MRF; Melo, MCB; Felix, LR; Garcia, IF; Maia, JC

Wcpghan 3: World Congress of Pediatric Gastroenterology, Hepatology and Nutrition, (): 89-92.

Seminars in Pediatric Surgery

Advances in pediatric colorectal surgical techniques

Rangel, SJ; de Blaauw, I

Seminars in Pediatric Surgery, 19(2): 86-95.

10.1053/j.sempedsurg.2009.11.018

[CrossRef](#)

Alimentary Pharmacology & Therapeutics

Systematic review: impact of constipation on quality of life in adults and children

Belsey, J; Greenfield, S; Candy, D; Geraint, M

Alimentary Pharmacology & Therapeutics, 31(9): 938-949.

10.1111/j.1365-2036.2010.04273.x

[CrossRef](#)

Health and Quality of Life Outcomes

Health-related quality of life in young adults with symptoms of constipation continuing from childhood into adulthood

Bongers, MEJ; Benninga, MA; Maurice-Stam, H; Grootenhuys, MA

Health and Quality of Life Outcomes, 7(): -.

ARTN 20

[CrossRef](#)

Journal of Pediatric Surgery

Transanal rectosigmoid resection for severe intractable idiopathic constipation

Levitt, MA; Martin, CA; Falcone, RA; Pena, A

Journal of Pediatric Surgery, 44(6): 1285-1291.

10.1016/j.jpedsurg.2009.02.049

[CrossRef](#)

Immunology and Allergy Clinics of North America

Psychological Impact of Eosinophilic Esophagitis on Children and Families

Klennert, MD

Immunology and Allergy Clinics of North America, 29(1): 99-+.

10.1016/j.iac.2008.09.011

[CrossRef](#)

Acta Paediatrica

Reduced quality of life in children with Gastro-oesophageal reflux disease

Marlais, M; Fishman, JR; Kogmeier, J; Fell, JME; Rawat, DJ

Acta Paediatrica, 99(3): 418-421.

10.1111/j.1651-2227.2009.01613.x

[CrossRef](#)

Pediatric Clinics of North America

Integrative approaches to childhood constipation and encopresis

Culbert, TP; Banez, GA

Pediatric Clinics of North America, 54(6): 927-+.

10.1016/j.pcl.2007.09.001

[CrossRef](#)

Paediatrica Croatica

Health-Related Quality of Life Assessment in Patients With Chronic Disorders, With the Emphasis on Children With Chronic Inflammatory Bowel Disease

Abdovic, S; Kolacek, S



Paediatrica Croatica, 54(2): 89-97.

Journal of Paediatrics and Child Health

Factors associated with childhood constipation

Inan, M; Aydinler, CY; Tokuc, B; Aksu, B; Ayvaz, S; Ayhan, S; Ceylan, T; Basaran, UN

Journal of Paediatrics and Child Health, 43(): 700-706.

10.1111/j.1440-1754.2007.01165.x

[CrossRef](#)

American Journal of Gastroenterology

Epidemiology of childhood constipation: A systematic review

van den Berg, MM; Benninga, MA; Di Lorenzo, C

American Journal of Gastroenterology, 101(): 2401-2409.

10.1111/j.1572-0241.2006.00771.x

[CrossRef](#)

Digestive Diseases and Sciences

Long-term outcome of functional childhood constipation

Khan, S; Campo, J; Bridge, JA; Chiappetta, LC; Wald, A; di Lorenzo, C

Digestive Diseases and Sciences, 52(1): 64-69.

10.1007/s10620-006-9308-9

[CrossRef](#)

Journal of Pediatric Surgery

Quality of life in children with slow transit constipation

Clarke, MCC; Chow, CS; Chase, JW; Gibb, S; Hutson, JM; Southwell, BR

Journal of Pediatric Surgery, 43(2): 320-324.

10.1016/j.jpedsurg.2007.10.020

[CrossRef](#)

Wcpghan 3: World Congress of Pediatric Gastroenterology, Hepatology and Nutrition

Precipitant Factors of Constipation During Childhood: Preliminary Results

Torres, MRF; Melo, MCB; Garcia, IF; Maia, JC; Felix, LR

Wcpghan 3: World Congress of Pediatric Gastroenterology, Hepatology and Nutrition, (): 93-96.

Gut

Rectal compliance and rectal sensation in constipated adolescents, recovered adolescents and healthy volunteers

van den Berg, MM; Voskuil, WP; Boeckxstaens, GE; Benninga, MA

Gut, 57(5): 599-603.

10.1136/gut.2007.125690

[CrossRef](#)

Journal of Pediatric Surgery

Antegrade enemas for defecation disorders: do they improve the colonic motility?

Aspirot, A; Fernandez, S; Di Lorenzo, C; Skaggs, B; Mousa, H

Journal of Pediatric Surgery, 44(8): 1575-1580.

10.1016/j.jpedsurg.2008.11.061

[CrossRef](#)

Journal of Pediatric Gastroenterology and Nutrition

[Quality of Life in Paediatric Gastrointestinal and Liver Disease: A Systematic Review](#)

Maity, S; Thomas, AG

Journal of Pediatric Gastroenterology and Nutrition, 44(5): 540-554.

10.1097/MPG.0b013e3180332dfo

[PDF \(182\)](#) | [CrossRef](#)

Journal of Pediatric Gastroenterology and Nutrition

[Tegaserod Use in Children: A Single-center Experience](#)

Liem, O; Mousa, HM; Benninga, MA; Di Lorenzo, C

Journal of Pediatric Gastroenterology and Nutrition, 46(1): 54-58.

10.1097/01.mpg.0000304454.99799.42

[PDF \(89\)](#) | [CrossRef](#)

Journal of Pediatric Gastroenterology and Nutrition

[Bowel Habits and Toilet Training in a Diverse Population of Children](#)

Wald, ER; Di Lorenzo, C; Cipriani, L; Colborn, DK; Burgers, R; Wald, A

Journal of Pediatric Gastroenterology and Nutrition, 48(3): 294-298.

10.1097/MPG.0b013e31817efbf7

[PDF \(107\)](#) | [CrossRef](#)

Journal of Pediatric Gastroenterology and Nutrition

[Measuring Quality of Life in Pediatric Patients With Inflammatory Bowel Disease: Psychometric and Clinical Characteristics](#)

Perrin, JM; Kuhlthau, K; Chughtai, A; Romm, D; Kirschner, BS; Ferry, GD; Cohen, SA; Gold, BD; Heyman, MB; Baldassano, RN; Winter, HS

Journal of Pediatric Gastroenterology and Nutrition, 46(2): 164-171.

10.1097/MPG.0b013e31812f7f4e

[PDF \(223\)](#) | [CrossRef](#)

**Keywords:**

Constipation; Children; Quality of life

© 2005 Lippincott Williams & Wilkins, Inc.