

Research Paper

Quality of Life for Children With Functional Abdominal Pain and Their Parents Copmared to Healthy Individuals



Hassan Karami^{1*}, Bahareh Lashtoo Aghae² , Jamshid Yazdani Charati³ , Alameh Abedi⁴

1. Pediatric Gastroenterology, Pediatric Infectious Diseases Research Center, Mazandaran University of Medical Sciences, Sari, Iran.

2. Mazandaran University of Medical Sciences, Ramsar, Iran.

3. Department of Biostatistics, School of Health Sciences, Mazandaran University of Medical Sciences, Sari, Iran.

4. Mazandaran University of Medical Sciences, Sari, Iran.



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ABSTRACT

Objectives: Functional abdominal pain (FAP) is a debilitating disorder that has a high prevalence among children. The goal of this study is to evaluate patients' and parents' perceptions of health-related quality of life (QoL) for children with FAP.

Methods: Between April 2018 and June 2019, a total of 200 children (including 100 with FAP and 100 healthy individuals) and 200 parents participated in this study. The participants completed a health-related QoL scale (pediatric quality of life inventory) that is scored on a scale from 0 (poor) to 100 (best). Children with FAP and their parents were compared to a control group consisting of healthy children.

Results: Children with FAP had lower self-report QoL scores (46.97 ± 17.43) compared to their healthy peers (78.69 ± 13.02) and the difference was significant ($P < 0.05$). Parents of children with FAP reported lower QoL scores compared to parents of the control group (45.56 ± 14.19 vs 75.94 ± 15.06 , $P < 0.05$) but it was similar to the scores for their children.

Conclusions: The present study demonstrated that children with FAP and their parents experience a poor QoL compared to their healthy peers.

* Corresponding Author:

Hassan Karami, PhD.

Address: Mazandaran University of Medical Sciences, Ramsar, Iran.

Tel: +98 (?) ??

E-mail: dr_hkarami87@yahoo.com

1. Introduction

Health-related Quality of Life (QoL) is a measurement of health and less attention has been paid to this aspect of children's health. In recent decades, alteration in symptoms of disease and effects of reducing or resolving symptoms on QoL by upgrading the physical, emotional, social, and cognitive status that can improve children's well-being and identify treatment efficacy has become an important issue (1). However, there are prevalent disorders in children without well-accepted treatment that may last for a long time, even into adulthood, and severely affect their health and QoL. Functional abdominal pain disorders (FAPDs) are a type of such disorder (2). FAPD includes irritable bowel syndrome, functional dyspepsia, abdominal migraine, and functional abdominal pain not otherwise specified (3, 4).

FAP is common in the pediatric group with a prevalence rate of up to 25% (5, 6). Although there are no organic and infectious causes or inflammatory, structural, and biochemical processes in FAP, it is a major challenge for the children's parents as FAP deeply affects the lives of children because it may interfere with school, exercise, and daily activities (3). FAP is a debilitating disorder (6). Studies on the health-related QoL of children with FAP showed a significant difference compared to healthy children (2, 7). Complications associated with FAP include sleep difficulties, depression, social phobia, anxiety, and impaired physical ability, such as headaches, dizziness, and fatigue (8). In schoolchildren and adolescents, FAP can lead to school dropout, social withdrawal, and subsequently substance abuse, violence, family disruption in later life, and high rates of health care utilization (8, 9). A national survey on 20 000 adolescents found the risk of depression among adolescents and those with abdominal pain to be 16% and 45%, respectively. Adolescents with frequent abdominal pain had less exercise and school activities. In addition, they experienced more feelings of fatigue, sadness, and loneliness (10).

There were reports of health-related QoL in children with organic gastrointestinal disorders, for example, inflammatory bowel disease (IBD); however, despite the high prevalence of FAP, studies regarding FAP as defined by the Rome criteria are rare (2, 11). Considering that both mental and physical health balance can lead to a higher QoL, especially in children, and their satisfaction from life can positively affect all family members, we have decided to investigate one of the dependent and

important situations. We aim to assess the effects of FAP on QoL among children and compare them to their healthy peers based on health-related, self-report, and parent-perceived QoL.

2. Method

Study Participants

This cross-sectional study was conducted from April 2018 to June 2019 in a pediatric clinic at BuAli Sina Hospital (north of Iran). A total of 200 children from the age of 5 to 14 years were divided into two groups, including 100 children with FAP and the rest as the control group. Meanwhile, the parents of these children participated in the study. All children and their parents separately completed the pediatric QoL inventory (PedsQoL). The sample size was calculated using Equation 1:

$$1. n_1 = n_2 = \frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right)^2 (\sigma_1^2 + \sigma_2^2)}{(\mu_1 - \mu_2)^2}$$

To diagnose FAP, all children were thoroughly examined by a pediatric gastroenterologist.

The eligibility criteria included 5- to 14-year-old children who met the Rome IV diagnostic criteria (the Rome criteria are a set of criteria used by clinicians to classify the diagnosis of a patient with functional gastrointestinal disorders [disorder of gut-brain interaction]). FAP was defined as periumbilical pain in patients who had normal physical examination and biochemical and laboratory test results, in addition to a normal abdominal ultrasonography evaluation with no concomitant chronic illness and history of cognitive delay (12). The control group was randomly selected from a community-based, general pediatrics office at the time of a routine physical examination. They did not have any organ-neurological disorder.

Health-Related Quality of Life

Children's health-related QoL was assessed via PedsQL. This method is used to measure health-related QoL in healthy children and adolescents and individuals with acute and chronic health conditions. The PedsQL can be completed by parents (proxy report) as well as children and young people (self-report). The PedsQL includes 23 items to measure physical (8 items), emotional (5 items), social (5 items), and school functioning (5 items) aspects. Items on the PedsQL generic core scales are inversely scored and transformed to a 0-100 scale. Higher scores indicate better health-

Table 1. Comparison of QoL in FAP and healthy children (children self-report) (n=100)

QoL in Case and Control Groups	Groups	Mean
Emotional	Case	38.64
	Control	72.76
Physical	Case	46.43
	Control	80.25
Social	Case	38.88
	Control	76.95
School	Case	62.95
	Control	84.80

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related QoL: 0 indicates no problem=100, 1 indicates almost never=75, 2 indicates sometimes=50, 3 indicates often=25, and 4 indicates almost always a problem (13). The mean scores are computed as the sum of the items divided by the number of answered items.

Measurements and statistical analysis

The primary objective of this study is to determine the QoL for children with FAP and compare it to the healthy control group. Secondary objectives include parents' assessments of their children's QoL and differences in perceptions between children and their parents.

This study was approved by the Ethics Committee of Mazandaran University of Medical Sciences (IR.MA-ZUMS.REC.91.151). The continuous and categorical variables were expressed as Mean±SD, frequencies, and

percentages, respectively. The Pearson Chi-square test, the Fisher exact test (categorical variables), the student t test, and the Mann-Whitney test (continuous variables) were used to examine and compare the Rome III criteria within and between groups. The P-value of less than 0.05 was considered statistically significant.

3. Results

Overall, 200 children and their parents completed the PedsQL at the time of the evaluation. The children population included 110 (55%) boys (50 with FAP) and 90 (45%) girls (50 with FAP) with Mean±SD age of 8.25±2.21 years. The Mean±SD age for children in the FAP group was 8.15±1.92. In the control group, the Mean±SD age was 8.40±2.11, and 50% were girls. The groups were similar in term of gender (P=0.1) and age (P=0.2).

Table 2. Comparison of QoL in FAP and healthy children (parents' report) (n=100)

QoL in Case and Control Groups	Groups	Mean±SD	SE
Emotional	Case	32.10±17.06	1.71
	Control	71.20±18.63	1.86
Physical	Case	42.92±24.64	2.46
	Control	76.23±18.19	1.82
Social	Case	36.60±20.43	2.04
	Control	75.34±17.54	1.75
School	Case	70.63±17.41	1.74
	Control	80.99±16.80	1.68

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The results for children with FAP and their parents were compared to the results of the control group. Children with FAP had lower QoL scores compared to the control group (46.97 ± 17.43 vs 78.69 ± 13.02 , $P < 0.001$). The FAP group had physical, emotional, social, and school scores lower than the control group (Table 1); the parents of the former group gave the lowest score to their children compared to the latter.

Parents' QoL report showed that the FAP group gave the lowest score to their children compared to the control group (45.56 ± 14.19 vs 75.94 ± 15.06 , $P < 0.001$). They reported lower scores for emotional (32.10 ± 17.06 vs 71.20 ± 1.86 , $P < 0.001$), physical (42.92 ± 24.64 vs 76.23 ± 18.19 , $P < 0.001$), social (36.60 ± 20.43 vs 75.34 ± 17.54 , $P < 0.001$), and school (70.63 ± 17.41 vs 80.99 ± 16.80 , $P < 0.001$) aspects compared to the parents of the control group (Table 2).

The within-group comparison of the total QoL score showed significant differences between parents and children in the FAP ($P = 0.2$) and the control ($P = 0.12$) group. Parents of children with FAP reported higher school scores for their children but lower physical, emotional, and social scores. In total, there were no differences in QoL scores between parents and children in the FAP group.

4. Discussion

The present study indicated that FAP has considerable effects on the QoL of children. Children with FAP experienced lower QoL compared to healthy children in all subscales and total scores. The poor QoL was not limited to children because parents of these children represented the impairment QoL among their children compared to the parents in the control group.

The measurement of QoL is considered a scale for the overall psychosocial health of children suffering from chronic illnesses. It is the main outcome of the effectiveness of treatment interventions (14). Some studies found that up to 50% of children with FAPD experienced psychological disorders, such as anxiety and or depression (15). Therefore, they suffer more from mental and emotional turmoil and experience lower QoL in comparison to healthy children and even children with organic gastrointestinal diseases (2, 5, 7).

One of the main concerns related to FAP is the lack of definite etiology and effective management to control and decrease the pain and symptoms. Accordingly, parents cannot help their children as they suffer; therefore,

the issue of control is a problem for parents and may explain the low QoL in children with FAP from the point of view of children and their families (1).

FAPDs are known as disorders of gut-brain interplay. It is confirmed that concurrent gastrointestinal symptoms with psychological symptoms in children suffering from FAP have suggested a biopsychosocial model for FAP. The gut-brain axis is bidirectional communication between the central and the enteric nervous system. It involves direct and indirect pathways between cognitive and emotional centers in the brain with peripheral intestinal functions and is modified by environmental and anatomical factors (4).

Although FAP is common and leads to limitations in daily life, there is no effective treatment for FAP. However, resolving and or decreasing the pain and promoting the QoL are important and challenging issues for families and physicians (1).

There were several studies regarding the comparison of QoL among children with FAP based on the Rome criteria and children with organic gastrointestinal diseases associated with abdominal pain. Few studies have compared the former group's QoL with healthy children. In a study, the QoL of 494 preschool children with 5 somatic disorders, including neurofibromatosis type 1, wheezing illness, bronchiolitis, functional abdominal complaints, and burns, were compared to 410 healthy children based on the infant/toddler QoL questionnaire. All children with the health disorders had lower QoL scores compared to their healthy peers (16). While it is a parent-report questionnaire, the PedsQL is a patient-reported scale of the QoL and can be completed by parents. A self- and parent-report QoL can help families and children to better understand the symptoms and encourage appropriate behavioral changes for the promotion of QoL in children (2).

Youssef et al. (2) measured the QoL among 3 groups of children: with FAP, with organic gastrointestinal disease, and healthy individuals. The findings indicated that children with FAP had lower QoL compared to healthy children. This result is consistent with our study findings. Meanwhile, the QoL scores were similar to those for children with IBD or gastroesophageal reflux disease. In addition, parents' assessments of QoL in children with FAP showed that parents' perceptions of QoL for children with FAP were lower than their children and this is in contrast to our results. However, there were significant differences between the mean QoL scores in parents of the 2 groups (children with FAP vs healthy

children); this is in line with our results. Varni et al. (11) compared children with irritable bowel syndrome, FAP, and organic gastrointestinal disorders. The QoL in the FAP group did not differ from the others. A study compared children with FAP and other FAPDs, chronic constipation, gastroesophageal reflux, and IBD (689 subjects) with healthy individuals (1,114 subjects) via the PedsQoL. The scores were significantly lower for children and parents for all subscales in patients with FAPDs and organic gastrointestinal disorders compared to the healthy group; this is in line with our results. Also, the PedsQoL scores were significantly lower in patients with FAP compared to the scores with organic gastrointestinal disorders except for parent proxy-report social functioning (17). In an experimental study, the measurement of QoL using the PedsQoL showed that the mean PedsQoL scores were 76 ± 13.66 and 74.33 ± 12.57 that after a web-based psychosocial intervention for children with FAP increased to 81.92 ± 13.28 and 77.42 ± 15.09 in children and parents, respectively. In comparison to the control group, changes in PedsQL scores were 36% vs 11.43% in children and this difference was significant; however, it was 12% vs 11.11% in parents that showed no significant difference (18).

In the current study, children with FAP showed the most difference from control children in the social subscale and compared to their parents, although differences were not significant; they reported lower scores in all subscales except school functioning wherein parents had more scores. A low social score can reflect the child's concern about not communicating properly with his or her peers which may also affect their future relationships. Therefore, social learning plan and parental involvement in solving this concern may play an effective role in improving the overall score of QoL.

Of the limitations of this study, we can mention the lack of measuring the severity of pain in FAP children. It was better if a correlation was calculated between the severity of pain and the QoL score. In case of a significant relationship, they could be divided into subgroups according to the pain intensity, and then each could be compared with a control group, separately. Accordingly, in future research, it is suggested to design clinical trials to compare interventions and treatment plans among children with FAP according to the severity of pain to recognize appropriate treatment by measuring the QoL using the PedsQoL.

5. Conclusion

The present study demonstrated that in addition to pain, FAP affects children's emotional, social, physical, and school functioning aspects from the perspective of parents and children. They reported lower health-related QoL as measured by the PedsQoL in all dimensions compared to their healthy peers. Therefore, the PedsQoL can lead to a thorough understanding of the health and well-being of children with FAP and it can be used as a common instrument to assess therapy programs and identify the appropriate treatment for children with FAP.

Declaration of Patients' Consent

The authors assured that they have obtained all patients' and parents' consent forms. In this form, the patients and their parents have given their consent to complete the PedsQoL and other information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity; however, anonymity cannot be guaranteed.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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Authors contributions

All authors equally contributed to preparing this article.

Conflicts of interest

The authors declared no conflict of interest.

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