Behavioral Changes in Children with Constipation: A Cross Sectional Study in the Lebanese Population

**INTRODUCTION:**

Worldwide, constipation affects 12% of the population and can influence daily activities of individuals. Previous research found that the prevalence of anxiety and mood disorders was much higher in constipated patients than general population (Xinias, I., & Mavroudi, A. 2015). However, many people ignore the effect of this condition. This idea (the effect of constipation on behavior changes) was ever since wildly debated for whether we might be facing a true burden with an increase in people suffering from this disease. In fact, patients with constipation reported low scores for general well-being (mean score, 85.5, compared with 102.9 in a healthy population (Glav, A., & Lindberg, G. 1997). Constipation can be divided to organic “such as Hirschsprung’s disease (HRSC), spinal cord abnormality, hypothyroidism, diabetes insipidus, cystic fibrosis, gluten enteropathy, or congenital anorectal malformation, tumors” (Differential diagnosis: Functional vs, related to IBS (irritable bowel syndrome according to Rome criteria III) or unclassified. The treatment differs according to the type depending on the etiology (tumor removal, surgery, laxatives, fiber supplementation...). No studies were found showing the effect of each type on behavior. This disease being the most common cause of clinical visits to Gastroenterologists, evaluating the effect of constipation on behavioral changes and daily activity became mandatory. International studies have assessed the relationship between quality of life and constipation “prevalence and associated clinical characteristics of behavior problems in constipated children” (van Dijk, M. et al., 2010), “psychological disorders in patients with chronic constipation” (Hosseinzadeh, S. T. et al., 2011), showing that patient affected by constipation generally have an impaired quality of life by causing insomnia, abdominal discomfort, anal fissure, hemorrhoids, compared with general population. In fact, behavioral change is about using evidence and insight to support people to change their behavior whether people stop a particular type of act, or to increase or decrease it. There is no real theory of behavioral changes; it goes from a range of different ideas, including psychology, economics and neuroscience. However, with lack of detailed knowledge on whether the Lebanese population also faces the problem of constipation, an epidemiologic study is needed to enlighten the consequence of constipation, whether if affects negatively our life style by causing behavioral changes or not. Thus, this study was conducted to demonstrate the influence of constipation on daily life, by affecting behavior, academics, communication, and emotions. Our purpose of conducting a more comprehensive study of the Lebanese population is to encourage individuals with constipation to seek medical advice and to encourage the public health community to apply more effort for an earlier management of this disease. Furthermore, an early management can prevent the late consequences of constipation. For example, “some children with chronic and recurrent constipation can develop a problem with bowel leakage (called fecal incontinence), in which liquid stool leaks around the large hard stool in the rectum” (Loening-Bauke, V. 2005).
OBJECTIVES:

Primary objective: To assess the effect of constipation on behavioral changes (physical, emotional, social, and school functioning). Secondary objectives: a) To determine the difference in quality of life between constipated and non-constipated children of the same age range. b) To provide the public health community with a study to identify the need of early management to prevent the consequences of constipation in children aged 8 to 12 years.

SUBJECTS AND METHODS:

Ethical Information: The ethical committee of the Rafic Hariri University Hospital approved the conduction of this study by distributing the questionnaire to the children aged between 8 and 12 years old. Their parents were present while filling the questionnaire and approved their children’s participation in the study. The children or their parents had the right to stop the questionnaire at any time they wished and to skip answering any question they didn’t want to answer.

Study Design: A cross sectional study was conducted in Rafic Hariri University Hospital between December 2017 and April 2018. The patients were chosen consecutively, based on their constipation status by medical students at the Lebanese University. Therefore, our independent variable was constipation, while dependent variables were: physical, emotional, social and school functioning, as well as quality of life.

Study Population: Number of Patients: The study’s sample size was 86 individuals: 44 with constipation and 42 healthy.

Inclusion criteria were: Age between 8 and 12 years old. Both genders. All socioeconomic levels.

Exclusion criteria: Individuals with inflammatory bowel disease. Individuals with known psychiatric problem; Individuals with known autism; Individuals with divorced parents;

Procedures of Data Collection and Measurements: Participants were asked by a validated questionnaire “PedsQL 4.0” 37 about their physical, emotional, and social wellbeing, as well as their school functioning (questionnaire is in Annex 1). The overall quality of life was computed based on all these sub scores. PedsQL questionnaire consists of 23 items that are reverse scored. Physical functioning consists of 8 items, while emotional, social, and school functioning had 5 items each. These items were transformed to a 0 to 100 scale, where higher scores were an indicator of a better quality of life. The Physical Health Summary Score was the mean of the physical functioning items. The Psychosocial Health Summary Score consisted of the mean of Emotional, Social, and School functioning scales. Coding was as follows: Never: 100. Almost never: 75. Sometimes: 50. Often: 25. Almost always: 0.

Statistical Analysis:

SPSS was used to analyze and interpret the data received from our population. Data entry was performed using Excel. Descriptive results first showed the distribution of our sample in terms of constipation groups, their answers to the PedsQL items, and the distribution of the PedsQL subscales and total score. Normality distribution was checked for all the scores. Independent samples T test was performed to check the differences between the constipated and non-constipated patients for the scales normally distributed, while its non-parametric equivalent, the independent samples Mann Whitney U test was used for those that weren’t normally distributed. Statistical significance level was P-value < 0.05.

RESULTS:

Descriptive Statistics: The surveyed children were half constipated half non-constipated (Figure 1).
Figure 1: Constipation Status

The normality tests for the distribution of the PedsQL score and its subscales. Normality tests were statistically significant for the “Physical Functioning Scale Score” and the “School Health Summary Score” meaning that these scores didn’t follow a normal distribution. Thus, the Independent samples Mann Whitney U Test should be used to test the difference between the constipated and non-constipated children for these scales. However, “Emotional Health Summary Score”, “Social Health Summary Score”, and “PedsQL total scale score” were all normally distributed, meaning that we can use the Independent Samples T test to test constipation groups’ differences for these scores (Table 1).

Table 1: Tests of Normality

<table>
<thead>
<tr>
<th>Tests of Normality</th>
<th>Kolmogorov-Smirnov*</th>
<th>Shapiro-Wilk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Health Summary Score = Physical Functioning</td>
<td>0.117 83 0.007</td>
<td>0.954 83 0.005</td>
</tr>
<tr>
<td>Emotional Health Summary Score</td>
<td>0.097 83 0.052</td>
<td>0.983 83 0.343</td>
</tr>
<tr>
<td>Social Health Summary Score</td>
<td>0.074 83 0.200</td>
<td>0.970 83 0.052</td>
</tr>
<tr>
<td>School Health Summary Score</td>
<td>0.163 83 0.000</td>
<td>0.963 83 0.017</td>
</tr>
<tr>
<td>Psychosocial Health Summary Score</td>
<td>0.058 83 0.200</td>
<td>0.991 83 0.854</td>
</tr>
<tr>
<td>PedsQL total scale score</td>
<td>0.078 83 0.200</td>
<td>0.988 83 0.661</td>
</tr>
</tbody>
</table>

Answers to PEDSQL: Physical Functioning: More than half of the non-constipated patients (58.5%) never found it hard for them to walk more than one block, while 25.6% of constipated children almost always faced this issue (Figure 2).

Figure 2: PedsQL Physical Functioning Item 1

The majority of the non-constipated children never (34.1%) or almost never (31.7%) find it hard for them to run, while constipated children often (32.6%) or often always (20.9%) face this problem (Figure 3).
Non-constipated patients never (36.6%) or almost never (34.1%) find it hard to do sports activities or exercise, while constipated patients often (34.9%) or almost always (23.3%) have this problem (Figure 4).

Non-constipated children never (26.8%) or almost never (39%) find it hard to lift something heavy, while constipated children sometimes (39.5%), often (27.9%), and even always (14%) face this problem (Figure 5).

More than half of the non-constipated children (58.5%) never find it hard to take a shower or a bath by themselves, compared to only 39.5% of constipated children (Figure 6).
Figure 6: PedsQL Physical Functioning Item 5
Among non-constipated children, 65.9% never find it hard to do chores around the house, compared to only 27.9% in constipated children (Figure 7).

Figure 7: PedsQL Physical Functioning Item 6
Non-constipated children sometimes (31.7%), almost never (31.7%), or never (29.3%) hurt or ache, while constipated ones sometimes (44.2%), often (27.9%), and almost always (9.3%) suffer from pain (Figure 8).

Figure 8: PedsQL Physical Functioning Item 7
Non constipated children almost never (43.9%) have low energy, while constipated children often (941.9%) do (Figure 9).
Emotional functioning: Among non-constipated children, 30% almost never feel afraid or scared and 35% sometimes do, while only 18.6% of constipated children almost never feel afraid, and 44.2% sometimes do (Figure 10).

Non-constipated children seem to feel sad or blue less frequently than constipated children: non-constipated almost never (35%), sometimes (42.5%), or often (7.5% only) feel sad or blue compared to 11.6%, 44.2%, and 32.6% respectively in constipated children (Figure 11).
Figure 11: PedsQL Emotional Functioning Item 2
The majority of non-constipated children never almost never (35%), or sometimes (32.5%) feel angry, while constipated ones sometimes (27.9%), often (32.6%), or almost always (20.9%) do (Figure 12).

Figure 12: PedsQL Emotional Functioning Item 3
Non constipated children less frequently had trouble sleeping: 42.5% of them never had trouble sleeping, compared to only 20.9% in constipated children (Figure 13).
Non-constipated children seem to worry less about what will happen to them: 42.5% never worry and only 2.5% almost always do, while only 18.6% of constipated never worry and 9.3% almost always do (Figure 14).

Social Functioning: Non-constipated children never (34.1%) or almost never (34.1%) have trouble getting along with other kids, while constipated children sometimes (37.2%) and often (32.6%) (Figure 15);
The majority of non-constipated kids (43.9%) never feel that other kids do not want to be their friends, while 41.9% of constipated children sometimes feel so (Figure 16).

**Figure 16: PedsQL Social Functioning Item 2**

Non-constipated children seem to less frequently claim that other kids tease them: almost half of them (48.8%) say this was never the case compared to only 20.9% of constipated children (Figure 17).

**Figure 17: PedsQL Social Functioning Item 3**

Non-constipated children seem to claim less frequently their inability to do things that other kids their age can do: 26.8% said it was never and 39% almost never the case, compared to only 4.7% and 16.3% respectively in constipated children (Figure 18).
Non-constipated children seemed to find it less frequently hard to keep up when they play with other kids: 34.1% of them never and 34.1 almost never did, while only 2.3% and 23.3% respectively in constipated patients did (Figure 19).

**School Functioning:** Non-constipated children seem to less frequently find it hard to pay attention in class: 41.5% of them almost never face this issue, compared to only 25.6% in constipated children (Figure 20).
More than half of non-constipated children (56.1%) sometimes forget things, while 32.6% sometimes and 32.6% often do in constipated children (Figure 21).

Non-constipated children almost never (34.1%) or sometimes (34.1%) had problem keeping up with their schoolwork, while constipated children reported this issue more frequently: sometimes (39.5%), or often (34.9%), (Figure 22).

Almost half of the non-constipated patients (48.8%) never missed school because of not feeling well, while only 30.2% of constipated never did (Figure 23).
Figure 23: PedsQL School Functioning Item 4

More than half of non-constipated children never missed school to go to the doctor or hospital, compared to only 39.5% of constipated (Figure 24).

Figure 24: PedsQL School Functioning Item 5

Differences between Constipation Groups:

The differences between the constipated and non-constipated patients in terms of total PedsQL score and its subscales. There is a statistically significant difference between constipated and non-constipated children in physical functioning (mean score for constipated patients = 75.9909; mean score for non-constipated = 46.439; P-value < 0.002). Non constipated children also have significantly higher (P < 0.001) Emotional Health Summary Score (65.62; 17.71), Social Health Summary Score (71.58; 14.93), Psychosocial Health Summary Score (71.08; 12.19) than constipated children. Furthermore, the overall PedsQL total scale is significantly higher (P < 0.001) in non-constipated children (72.9; 12.45) compared to the constipated (50.86; 11.23) (Table 2).

Table 2: PedsQL and its Subscales Differences between Constipation Groups
DISCUSSION:

This cross-sectional study mainly aimed to assess the effect of constipation on behavioral changes (physical, emotional, social, and school functioning). It was also destined to determine the difference in quality of life between constipated and non-constipated children of the same age range and to provide the public health community with a study to identify the need of early management to prevent the consequences of constipation in children aged 8 to 12 years. A questionnaire-based survey was conducted in 86 children half of whom were constipated. Results showed a statistically significant difference between constipated and non-constipated children in physical functioning (mean score for non-constipated patients = 75.99; mean score for constipated = 46.44; P-value < 0.002). Non-constipated children also had significantly higher (P-value < 0.001) Emotional Health Summary Score (65.62; 17.71), Social Health Summary Score (71.08; 12.19) than constipated children. These results match with those reported in a study lead in Sri Lanka on 1792 children, among which 7.7% had constipation, which proved that constipated kids had significantly lower HRQoL scores for physical (83.6 vs. 91.4 in controls, P-value < 0.0001), social (85.0 vs. 92.7, P-value = 0.0001), emotional (73.6 vs. 82.7, P-value = 0.0001), school functioning (75.0 vs. 82.5, P-value < 0.0001), and lower overall scores (79.6 vs. 88.0, P-value = 0.0001) 40. Moreover, a literature review found an impairment in both adult and child populations in the mental and physical components of QOL with mental health effects predominating over physical ones and a comparable impact with that of inflammatory bowel disease, musculoskeletal conditions and allergies (Belsey, J. et al., 2010). Furthermore, our study showed that the overall PedsQL total scale was significantly higher (P-value < 0.001) in non-constipated children (72.9; 12.45) compared to the constipated (50.86; 11.23). In fact, published studies consistently showed lower HRQoL in adults and children with constipation (Rajindrajith, S. et al., 2016). A systematic review including 20 studies of 2658, with data for 2344 children found significantly lower pooled total HRQoL scores in children with functional constipation in comparison with healthy ones (65.6 vs. 86.1; P-value < 0.01) (Vriesman, M. H. et al., 2019 Youssef, N. N. et al., 2005). Moreover, children with constipation had lower QOL scores than those with gastrointestinal diseases (inflammatory bowel disease and gastroesophageal reflux disease), and healthy children (Youssef, N. N. et al., 2005). However, this was not discussed in our results since we were only interested in the effects of constipation alone, ruling out other diseases interference. Constipation also significantly negatively affected parents and caregiver’s physical, emotional, social, cognitive, and communication QOL, as well as daily activities and relationships for families (Wang, C. et al., 2013). This study has much strength to report. In fact, even though constipation is a common childhood problem, its global burden was still quite unknown because data from many regions in the world were missing (Levy, E. I. et al., 2017), Lebanon being one of them. This study pointed out original information on this topic that was never discussed previously in Lebanon in this specific pediatric population, to our knowledge. Besides, it was able to prove the significant difference in quality of life between constipated and non-constipated children. We
also evaluated emotional, school, social and physical functioning differences in these children and were able to prove the differences. However, some limitations were present in this work. A lot of factors such as constipation’s duration and symptoms, the child’s relationship with the caregiver, family economic status were known to influence HRQOL (Wang, C. et al., 2013), but weren’t assessed in this work. The current results fail to eliminate confounding factors so further studies are needed to evaluate the confounding factors and those associated with HRQOL in Lebanese constipated children. We weren’t able to determine gender differences due to selection bias caused by the choice of participants based on their constipation status. Furthermore, no academic differences were noted between participants since we were limited to a specific age group where all the subjects have mainly similar levels.

CONCLUSION:

This study showed lower overall QOL in children with constipation, as well as impaired school, social, physical, and emotional functioning. This shows that the overall wellbeing of constipated children is compromised by their disease and needs to be addressed in clinical settings besides the treatment of symptoms of constipation. This study shows the importance of evaluating and tackling all the components of wellbeing by pediatricians so that the constipated kids and their families could get the appropriate care they deserve. However, further studies need to target the associated factors that also affect QOL, such as socioeconomic level, family dynamics, and the child’s relationship with their caregivers, the presence of any abuse notion, the constipation’s duration and symptoms, school arrangements that might be forcing kids to induce constipation. Besides, the public health community needs to recognize the magnitude of constipation in children and its huge impairment in their lives as well as their families functioning. Further studies could also target the evaluation on a nationally representative manner of the prevalence of constipation in different Lebanese subgroups. Finally, guidelines must be issued and followed by pediatricians and general practitioners to routinely assess the quality of life of constipated patients, and to target al.1 the impaired aspects in parallel with treating the physical symptoms and signs of constipation.

REFERENCES: