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Martins G[1], Varghese A[2], Dave S[3], Farhat W[2]
1. University of Brasilia, Department of Nursing, Brazil, 2. The Hospital for Sick Children (Sick Kids), Division of Urology, Toronto, Canada, 3. University of Western Ontario, Division of Urology, London, Canada

IDENTIFYING INDIVIDUAL, FAMILIAL AND ENVIRONMENTAL FACTORS ASSOCIATED WITH THE SEVERITY OF PEDIATRIC BLADDER BOWEL DYSFUNCTION: A BRAZILIAN PILOT STUDY

Hypothesis / aims of study
Bladder bowel dysfunction (BBD) describes a constellation of abnormal urinary symptoms of storage, emptying, or both and abnormal bowel patterns such as constipation and encopresis. Considering that behavioral modification is the first-line treatment for BBD, it is of utmost importance to identify contributing factors related to the severity and presentation of BBD to prevent its onset or to treat it effectively. Therefore, we investigated the relationship between individual, familial and environmental variables and their impact on the severity of BBD, using a validated questionnaire (Dysfunctional Voiding Symptom Score: DVSS).

Study design, materials and methods
A pilot prospective observational study was conducted with a sample of 15 parents and their children with BBD, between September and December 2013, referred to a Brazilian Pediatric Urology Nursing Clinic, at the University Hospital of Brasilia/University of Brasilia, Brazil. Written assents and consents were obtained from all children and their parents. Families were interviewed and assessed by 3 questionnaires. The first questionnaire collected data regarding potential contributing factors for BBD related to the individual, family and environment. The second questionnaire captured a comprehensive history about the child´s bladder and bowel regimen and was used to ascertain the predominant BBD subtypes. The third questionnaire (DVSS) was used to measure the severity of BBD.
Since the first questionnaire assessed several correlated variables, for statistical analysis, multiple correspondence analyses was performed. A priori, we selected 9 groups of variables, each defining a potential aspect of the child, his or her environment and family, which could potentially impact the severity of BBD. A multiple linear regression model was then constructed to identify the relationship of each of these 9 variable groups and the severity of BBD (measured by the DVSS).

Results
Patient demographics showed that 40% of children enrolled in the study were female (6/15), with an overall mean age of 9.7 years (range from 6 to 12). The most prevalent BBD categories were: urgency/overactive bladder (22%), followed by dysuria associated with previous UTI (73%) and holding maneuvers suggestive of OAB (59%). Of the 9 variable groups assessed in our multiple linear regression model, 5 were statistically significant predictors of BBD severity. Children reporting healthy eating habits and those residing in rural areas and who avoid using public washrooms had less severe DVSS scores. Conversely, a positive history of constipation or a family history of urological conditions (overactive bladder, hydronephrosis, nephrolithiasis) was also associated more severe DVSS score. The multiple correspondence analyses allowed us to predict specific combinations of variables; for example, in children older than 10 years, who study in private school and had a report of failing grade, the BBD severity was low. The overall regression model was adequate and could explain 79% (R^2=0.79) of the data variability.

Storage Symptoms (N=15)
- Increased daytime urinary Frequency — 19%
- Decreased daytime urinary Frequency — 5%
- Daytime incontinence — 11%
- Enuresis — 19%
- Daytime incontinence & Enuresis — 8%
- Urgency — 22%
- Nocturia — 16%

Voiding Symptoms (N=15)
- Voiding Symptoms (N=15) — 73%
- Hesitansy — 13%
- Straining — 7%
- Intermittency — 7%
- Dysuria (associated with previous ITU report)

Other symptoms (N=15)
- Holding maneuvers — 59%
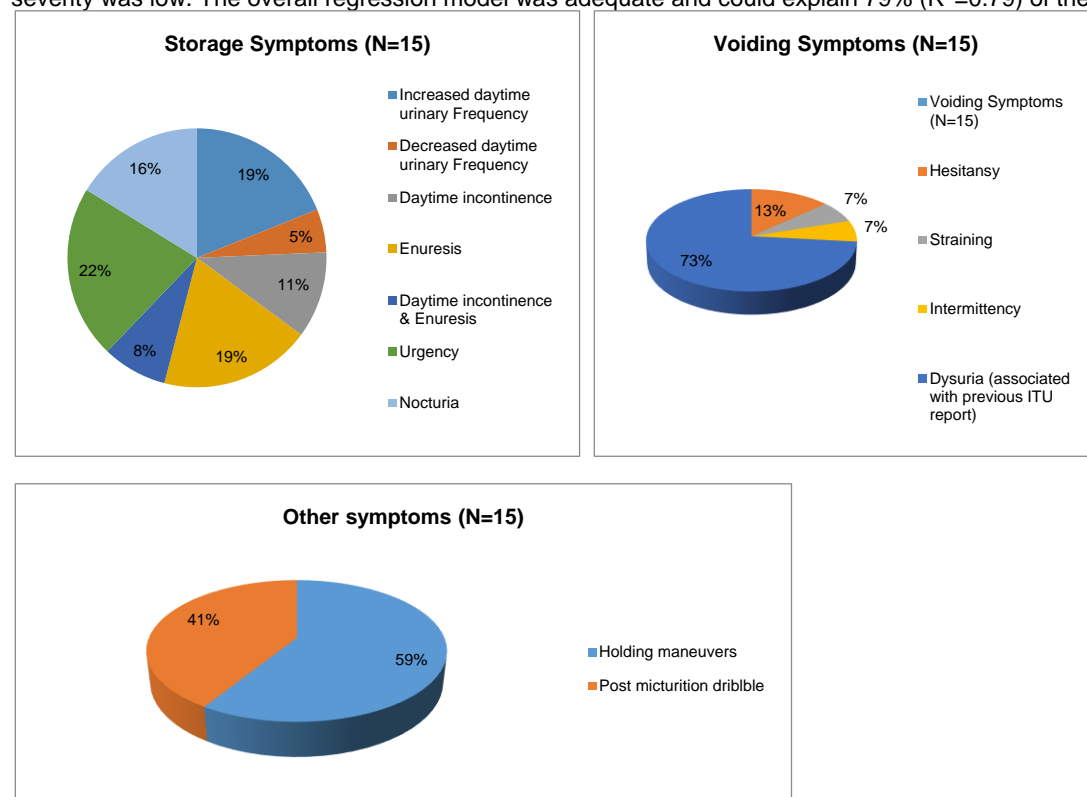- Post micturition driblble — 41%

Table 2. Backward multiple regression analysis of significant contributing factors based on the effect of individual, familial and environment characteristics and the DVSS score. Brazil, 2013.

Variables*	Mean Square	F	Sig.
Intercept	8.40	146.0	<.0001
Factors related to increased LUTS score: History of constipation	0.63	9.2	.001
Family history of bladder issues	1.05	19.3	0.002
Factors related to decreased LUTS score: Children with healthy eating habits	-0.52	12.0	.001
Children who live in rural areas and who avoid using public washrooms	-0.92	7.0	0.03

*R^2 (Sum of squares) =0.79

Concluding message
The severity of pediatric BBD can be potentially affected by several related factors pertaining to the individual patient, his or her family and environment. This pilot study, limited by its sample size shows some potential predictors, which can impact the severity of BBD as assessed by the DVSS score. The factors which increased the severity of BBD were: a history of constipation and family history of bladder issues. Factors associated with a lower DVSS score were: children with healthy eating habits, living in rural areas and avoiding public washroom use. This study may enable pediatric healthcare practitioners to provide a multi-dimensional assessment, in order to identify the key components responsible for triggering BBD and impacting its severity.

References
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