

Nocturnal enuresis in children from Santo Domingo, Dominican Republic: a questionnaire study of prevalence and risk factors

Stephanie Gonzalez Mejias,¹ Kamleshun Ramphul²

To cite: Mejias SG, Ramphul K. Nocturnal enuresis in children from Santo Domingo, Dominican Republic: a questionnaire study of prevalence and risk factors. *BMJ Paediatrics Open* 2018;**2**:e000311. doi:10.1136/bmjpo-2018-000311

► Additional material is published online only. To view please visit the journal online (<http://dx.doi.org/10.1136/bmjpo-2018-000311>).

SGM and KR contributed equally.

Received 12 May 2018
Revised 18 July 2018
Accepted 5 August 2018



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¹Department of Pediatrics, Robert Reid Cabral Children's Hospital affiliated to the Universidad Iberoamericana (UNIBE) School of Medicine, Santo Domingo, National District, Dominican Republic

²Department of Pediatrics, Shanghai Xin Hua Hospital affiliated to Shanghai Jiao Tong University School of Medicine, Shanghai, China

Correspondence to

Dr Stephanie Gonzalez Mejias; spg.gm@aol.com

ABSTRACT

Objective To determine the prevalence of paediatric nocturnal enuresis in Santo Domingo, Dominican Republic.

Design A cross-sectional study was performed using a pretested questionnaire.

Setting Three different schools in Santo Domingo, Dominican Republic.

Participants 700 children aged 5–11 years attending one of the different schools in Santo Domingo, Dominican Republic.

Intervention The study was carried out from November 2017 to December 2017.

Main outcome measures Prevalence of nocturnal enuresis.

Results 700 questionnaires were sent to be filled and 682 were returned. 655 fully filled questionnaires met the requirements of the study. 183 children were identified with nocturnal enuresis among which 88 were boys and 95 were girls. Only 11% of children with enuresis sought medical help. The prevalence of nocturnal enuresis was 27.9%. No statistical significance was found between gender, order in the family, constipation and breast feeding ($p>0.05$). Age, deep sleep and family history of enuresis were strongly associated with nocturnal enuresis.

Conclusions The prevalence of nocturnal enuresis in Santo Domingo was found to be 27.9% and it was higher compared with some Asian countries but lower than Morocco and Jamaica. Only 11% of children with enuresis sought medical help. Nocturnal enuresis is an important problem in the paediatric population of Santo Domingo, but very few children receive treatment due to the financial costs of healthcare in the Dominican Republic.

INTRODUCTION

Nocturnal enuresis is a common condition seen in many young children.¹ It is defined as bedwetting in a child with no history of congenital urogenital defect or acquired defect after the age of 5.² This condition can be distressing for both the child and the parents concerned. It has been acknowledged as a benign condition with multifactorial causes present in different cultures and races. Some studies have suggested that the physiology of sleep, hormonal levels such as antidiuretic

What is already known on this topic?

- Nocturnal enuresis is a common condition seen in many young children of different races and cultures.
- Recent studies have shown that enuresis is a multifactorial condition based on organic causes as well as genetic risk factors.
- The prevalence of nocturnal enuresis in the paediatric population of Dominican Republic is yet unknown.

What this study hopes to add?

- The prevalence of nocturnal enuresis was 27.9% and it is in accordance with reported studies from Congo (26%) and Nigeria (21.3%).
- Girls had a higher prevalence of nocturnal enuresis in this study (29.4%) than boys (26.5%).
- Only 11% of children sought medical help—mainly due to financial concerns.

hormones, electrolyte levels of sodium and potassium and the physiology of the bladder are all potential factors responsible for the pathophysiology of this condition.^{3 4} There have been multiple studies that were carried out for different countries and cultures but the prevalence of nocturnal enuresis in the paediatric population of Dominican Republic is yet unknown.

The main goal of this study was to determine the prevalence of nocturnal enuresis in Dominican Republic and to identify any associated risk factors. Since healthcare in Dominican Republic is not free, the questionnaire also investigated if the cost of treatment was an important factor for refusing medical help in children with enuresis. The outcome of this study will allow both parents and the health institutions to understand the prevalence of nocturnal enuresis in Santo Domingo and provide better solutions for the treatment and cost of treatment of children.

Proper counselling, education and information can also be done following this study.

MATERIALS AND METHODS

Study design and participants

A cross-sectional study was conducted among children attending three primary schools in Santo Domingo, Dominican Republic, from November 2017 to December 2017. The study population was randomly selected to include children aged 5–11, from different social strata among different schools in Santo Domingo, Dominican Republic.

A questionnaire was designed to help detect children with nocturnal enuresis and different risk factors (supplementary file 1) It was first prepared in English and then translated into Spanish (predominant language in Santo Domingo). The questionnaire was assessed for content validity and modified accordingly by several experts. Appropriate drafting and editing was done and the final version was pilot tested with a small batch of 100 students. The questionnaires were sent to be filled in by the parents and data collection in all schools was performed with the help of the Dean and teachers. Parents were also advised to keep a sleep journal for the children to improve accuracy of the data. A contact number was included to answer any questions the parents had while undertaking the questionnaire.

A total of 682 questionnaires were returned and 655 fully filled questionnaires were considered for the study. Children were then further divided into different age groups, namely: 5–7, 7–9 and 9–11 years of age. The questionnaire consisted of a set of 22 questions involving age, sex, order in the family, presence of deep sleep, history of constipation, family history of nocturnal enuresis, breast feeding history and management of the condition by parents.

Statistical analysis

Data were analysed using SPSS V.24.0 (SPSS) for windows and χ^2 test was used to study the associations between categorical variables. Differences were considered significant when $p < 0.05$.

RESULTS

Out of 700 questionnaires distributed among the schools, 682 were returned with a response rate of 97.4%. After meticulous selection, 655 fully filled questionnaires were considered for this study. Twenty-seven questionnaires were excluded as they were not completely filled in. Out of the 655 children, 332 (50.7%) were boys and 323 (49.3%) were girls.

A total of 183 children (27.9%) were identified with primary enuresis among which 88 were boys and 95 were girls. The frequency of enuresis was further subdivided into three age groups. Eighty-six children between 5 and 7 years of age, 65 children between 7 and 9 years of age and 32 children between 9 and 11 years of age were

Table 1 Prevalence and factors associated with nocturnal enuresis in children from Santo Domingo, Dominican Republic

	Enuretic (%)	Non-enuretic (%)	P values
Sex			0.407
Male	88 (26.5)	244 (73.5)	
Female	95 (29.6)	228 (70.6)	
Age (years)			<0.001
5–7	86 (38.2)	139 (61.8)	
7–9	65 (29.3)	157 (70.7)	
9–11	32 (15.4)	176 (84.6)	
First child			0.058
Yes	83 (24.7)	253 (75.3)	
No	100 (31.3)	219 (68.7)	
Deep sleep			<0.001
Yes	121 (45.3)	146 (54.7)	
No	62 (16.0)	326 (84.0)	
Constipation			0.158
Present	38 (23.6)	123 (76.4)	
Absent	145 (29.4)	349 (70.6)	
Family history			<0.001
Paternal			
Present	140 (56.2)	109 (43.8)	
Absent	43 (10.6)	363 (89.4)	
Maternal			<0.001
Present	133 (52.0)	123 (48.0)	
Absent	50 (12.5)	349 (87.5)	
Breast feeding up to age of 4 months			0.365
Present	133 (29.0)	326 (71.0)	
Absent	50 (25.5)	146 (74.5)	

diagnosed with nocturnal enuresis. Eighty-three parents (51%) admitted that the cost of medical treatment was the main reason for avoiding any medical help. Statistical significance between age, paternal history, maternal history, deep sleep and nocturnal enuresis was found in this study, as seen in [table 1](#). Gender, order in the family, constipation and breast feeding were not statistically relevant to nocturnal enuresis.

A total of 163 children (89.0%) who had enuresis did not seek medical help for their condition. The parents opted for self-help strategies among which 134 (82.2%) restricted fluid intake in the child at least 1 hour before bedtime and 122 (74.9%) parents woke up the child to empty their bladder. Twenty children (11%) sought help from a doctor and three children needed further evaluation.

DISCUSSION

This is the first study done in Santo Domingo, Dominican Republic, to determine the prevalence of nocturnal

enuresis among children aged 5–11. The prevalence of nocturnal enuresis was 27.9% and it is in accordance with reported studies from Congo (26%)⁵ and Nigeria (21.3%)⁶ but slightly higher in comparison with India (12.6%),⁷ Finland (8.2%)⁸ and Bangkok (3.9%).⁹ The prevalence in this study was lower than Morocco (35.0%)¹⁰ and Jamaica (50%).¹¹ The differences can be attributed to different sample sizes and selection criteria in terms of age and definition of nocturnal enuresis.

Girls had a higher prevalence of nocturnal enuresis in this study (29.4%) than boys (26.5%) with similar results being reported in Congo,⁵ Turkey¹² and Thailand.⁹ The prevalence of enuresis in this study decreased with increasing age and a statistical significance confirmed the findings of multiple studies.^{5 13–15} Breast feeding is considered important for the first 4 months of life but no statistical significance was found in this study which is in accordance with Gümüş *et al's* study.¹² Singh *et al*¹⁶ found a higher prevalence of enuresis in children who were not breast fed during the first 4 months of life. There was however no control group in their study and further studies should be carried out to understand the relationship between breast feeding and enuresis.

Presence of an enuresis history on the maternal or paternal side has often been associated with a higher risk of enuresis in the child^{17–19} and a similar conclusion was reached in this study. Previous study has shown that regions on chromosomes 8, 12 and 13 were associated with a higher risk of nocturnal enuresis in the child.²⁰ Deep sleep has been linked with nocturnal enuresis in this study and similar findings were reported.⁵ However, proper sleep studies should be performed as suggested by Yeung *et al*.²¹

Healthcare in Dominican Republic is not completely free and easily accessible to everyone. Eighty-three parents (51%) admitted that the cost of medical treatment was the main reason for avoiding any medical help. The Dominican Republic is classified by the WHO as a middle-income country. They, however, noted that there is a major gap between economic classes and the lower class families are most affected. In our study, parents have also expressed concerns about the cost of travelling for treatments. An improvement to the current situation can involve biannual visits by physicians to assess the conditions in schools and provide appropriate care and follow-ups for enuresis for free or at a discounted fee.

The management of nocturnal enuresis in hospitals and health clinics in Dominican Republic involves several steps. A pretreatment evaluation is done by the physician to rule out any history that could raise concern. The initial treatment includes reassurance and starting a diary to monitor fluid intake at night, frequency of bedwetting and any encopresis. In some cases, the parents have to be properly educated that the children are not to be blamed and they should not be punished for bedwetting. Bedwetting alarms are also used in cases of frequent bedwetting and the progress is evaluated by the physician. This usually requires regular follow-ups and in some cases, a

psychological evaluation to rule out any event that might be contributing to the condition is also done. In severe and persistent cases, the physician might consider the use of drugs such as desmopressin. However, their use is not common in Santo Domingo for mild to moderate cases.

The study found out that 20 (11%) children sought medical help and only three children have not responded to bedwetting alarms. Prevention measures adopted by parents who did not seek medical attention included fluid restriction at least 1 hour before sleep (82.2%) and waking the child up to empty their bladder (74.8%). Families in Australia mostly opted for fluid restriction whereas in the USA and New Zealand the majority woke their children up to void their bladder.^{22 23}

Despite some limitations, the current study is the first to investigate the prevalence of nocturnal enuresis in children from Santo Domingo, Dominican Republic. An improvement to the current study and questionnaire would include the annual income of each household. It can provide an insight on the financial cut-off for seeking medical help. This concept was included in our initial set of 100 questionnaires. Only 13% of the parents reported their annual income and it was removed from the final draft used as parents in Dominican Republic were not willing to share that information. It is, however, strongly encouraged to be included in other studies, if the parents are willing to share. A broader study in the population of Dominican Republic through different cities will be helpful to identify children who are at risk for severe enuresis and proper education and prevention can be provided to parents to better help the children concerned.

Acknowledgements The authors thank all the parents and children who participated in the study and the deans and teachers who helped in collecting the data.

Contributors SGM, the corresponding author, contributed in collecting the data, organising the study, and takes final responsibility for the decision to submit for publication. KR was involved in the set-up of the study, the statistical analysis of the data and writing of the article.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent Parental/guardian consent obtained

Ethics approval The ethics committee of each school read and approved the research.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement All the data in the study are available to researchers via a data request to the corresponding author.

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