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## Prevalence of enuresis among primary school children in Port Harcourt

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**Abstract Background:** Enuresis is a common problem among children and adolescents. It can lead to important psychosocial disturbances. Knowledge of the prevalence and types of enuresis in a community would guide early intervention.

**Objectives:** To determine the prevalence of enuresis among primary school children aged 6-12 years in Port Harcourt (PHC) and the types of enuresis among these children.

**Methods:** A cross sectional study of enuresis among school children in 13 primary schools in three school districts in PHC was performed. Pretested questionnaires completed by parents/guardians and augmented by history obtained from the children were used to collect data from 922 school children. Descriptive statistics and chi-square test were used for data analysis.

**Results:** A total of 922 school children, consisting of 463 (50.2%) males and 459 (49.8%) females were studied. The response rate was 82.2%. The overall prevalence of enuresis was 23.2%. Enuresis was notably more common in boys (male: female ratio 1.4:1), and the prevalence rates decreased with increasing age. Of all enuretic children, 92.1% had nocturnal enuresis, 0.9% had diurnal and 7.0% had nocturnal-diurnal enuresis.

**Conclusion:** Enuresis is a common problem among school children in PHC, is more common in males. The predominant type is the primary nocturnal enuresis.

**Key Words:** Prevalence, Enuresis, Primary school-children, Port-Harcourt

### Introduction

Enuresis, also known as bed-wetting, is the involuntary and undesirable repeated discharge of urine into clothes or beds beyond the age of anticipated bladder control, usually after five years, by night or day.<sup>1-3</sup> Day-time bed-wetting is referred to as Diurnal.

Enuresis (DE) while nighttime bed-wetting is referred to as Nocturnal Enuresis (NE). Combined day and night-time bed-wetting is referred to as Nocturnal/Diurnal Enuresis. NE may be primary or

secondary.<sup>4</sup> Primary nocturnal enuresis (PNE) occurs when a child has never achieved a six month period of continuous nighttime bladder control while secondary nocturnal enuresis (SNE) refers to a child who has experienced a minimum six month period of continence before the onset of bed-wetting.<sup>4</sup> Enuresis is seen worldwide in all cultures and races.<sup>1,2</sup> The true incidence of enuresis is unknown because of under-reporting and imprecise definitions.<sup>1,2</sup>

Enuresis is frequently diagnosed among school children and is an important psychosocial problem for both parents and children. It places a child at risk of being a target for name-calling and teasing

from peers, behaviour that can damage a child's self esteem and place him or her at risk of rejection.<sup>4-6</sup> The presence of enuresis can place a limit on participation in highly desirable social experiences such as holiday camps and sleepovers. These children are commonly punished and are at significant risk of emotional and physical abuse.<sup>6</sup> Feeling of embarrassment, inferiority and anxiety; loss of self-esteem; negative effects on self perception, interpersonal relationship and school performance have been reported in children with enuresis.<sup>5-8</sup>

Epidemiological studies of enuresis across the world report varied prevalence rates of 4-40% amongst school children.<sup>1,4,9-16</sup> In the United States of America (USA) it ranges from 5-25% in children aged 4-10 years.<sup>4</sup> It is reported to be 3.88%, 12.9%, and 18.9% in Turkey, Italy and Australia respectively,<sup>10,11,15</sup> while it ranges from 6-9% in most Asian countries.<sup>1,2,9</sup> A prevalence of 35% was reported in Moroccan children.<sup>12</sup>

There is a dearth of literature about the prevalence of enuresis in Nigeria among primary school children. Two studies on this subject reported prevalence of enuresis of 17.6% and 21.3% among children in Igbo-Ora, a rural community in South West Nigeria and in Ehor community, Edo state respectively.<sup>13,14</sup> The sample size of these studies were relatively small. Anochie and Ikpeme reported a prevalence of enuresis of 25.3% among secondary school students aged 10 - 19 years in Port Harcourt<sup>16</sup>.

There is evidence that effective intervention by motivational therapy, behavior intervention and use of drugs can reduce the duration of the problem and help to improve the lives of these children and their families.<sup>17</sup> Studies<sup>17-19</sup> have shown restoration and new sense of confidence, improvement in self esteem and academic performance.

This study was conducted to determine the prevalence of enuresis and its types among school children in Port-Harcourt city. It also seeks to determine the age and sex distribution of enuresis in these children. It is envisaged that information from the study will assist health workers in planning appropriate intervention in this regard.

## Subjects and Methods

The study was carried out among 922 primary school children aged 6-12 years in thirteen different schools selected by multi-stage stratified random sampling, between November 2008 and March 2009 in Port Harcourt, Nigeria. The State Ministry of Education and the Research and Ethics Committee of the

University of Port Harcourt Teaching Hospital (UPTH) approved the study protocol. Informed written consent was obtained from the parents or guardians. In each selected school 90 pupils (15 from each arm of class) aged 6- 12 years were recruited by selecting all odd numbers using the class register. Children whose parents/ guardians refused consent for the study were excluded from the study.

A pre-tested questionnaire was used to get information on socio-demographic data and enuresis data. The questionnaires were distributed to the pupils with a written consent letter explaining the aims and procedure of the study in an enclosed envelop to the parents. The questionnaires were completed by the parents at home and returned to the investigator. The information obtained from the questionnaires was augmented by history obtained from the children. In this study, a child is said to have enuresis if he/she is incontinent of urine at night or day for at least once a month. The obtained data were analyzed using the computer program EPI INFO version 6 and Statistical Package for Social Sciences (version 16.0). Statistical significance at 95% confidence interval was  $p$  value  $< 0.05$ . Different groups were compared by means of  $\chi^2$ . All enuretic children were given a written referral to the paediatric Nephrologists in UPTH for further evaluation and treatment.

## Results

One thousand one hundred and seventy questionnaires were given to pupils, nine hundred and sixty two completed questionnaires were returned giving an overall response rate of 82.2%. Forty questionnaires were excluded because of incomplete and inconsistent data; therefore 922 questionnaires were included in the final analysis. Of these 922 children, 463 (50.2%) were males while 459 (49.8%) were females, giving a male female ratio of 1:1. The mean age of the study group was 8.6years $\pm$ 1.9years. The age and sex distribution of the study group is shown in Table 1. More females 87(64.0%), and males 39 (60.9%) were represented among children who were eight years and eleven years old respectively.

**Table 1:** Age and Sex distribution of the study population

| Age(yrs) | Males (%)  | Females (%) | Total |
|----------|------------|-------------|-------|
| 6        | 70 (46.4)  | 81 (53.6)   | 151   |
| 7        | 95 (54.6)  | 79 (45.4)   | 174   |
| 8        | 49 (36.0)  | 87 (64.0)   | 136   |
| 9        | 83 (49.4)  | 85 (50.6)   | 168   |
| 10       | 72 (56.7)  | 55 (43.3)   | 127   |
| 11       | 39 (60.9)  | 25 (39.1)   | 64    |
| 12       | 55 (53.9)  | 47 (46.1)   | 102   |
| Total    | 463 (50.2) | 459 (49.8)  | 922   |

### Prevalence of Enuresis

The prevalence of enuresis was 23.2%. The prevalence of enuresis was significantly higher in males than females (27.4% versus 19.0%,  $\chi^2=9.29$ ,  $p=0.002$ )

### Prevalence of enuresis by age

The highest prevalence rate of enuresis was seen at the age of 6 years and lowest at 11 years. The difference in the prevalence of enuresis in any of the age groups compared with the rest of the study group was only significant with respect to the 6 year age group as shown in Table 2. Generally, the prevalence of enuresis decreased as the age increased and the trend was statistically significant. ( $\chi^2$  for trend=3.98,  $p=0.045$ ).

**Table 2:** Prevalence of enuresis by age

| Age yr       | no         | Enuretic(%)       |
|--------------|------------|-------------------|
| 6            | 151        | 49 (32.5)         |
| 7            | 174        | 38(21.8)          |
| 8            | 136        | 36(26.5)          |
| 9            | 168        | 31(18.5)          |
| 10           | 127        | 24(18.9)          |
| 11           | 64         | 9(14.1)           |
| 12           | 102        | 27 (26.5)         |
| <b>Total</b> | <b>922</b> | <b>214 (23.2)</b> |

### Types of Enuresis

Among the enuretic children, 197(92.1%) had nocturnal enuresis, 2(0.9%) had diurnal enuresis, while 15 (7%) had nocturnal-diurnal enuresis (Table 3). Out of the 197 with nocturnal enuresis, 181(92.0%) had primary nocturnal enuresis (PNE), 14(7%) had secondary nocturnal enuresis (SNE) while in 2(1%) the type of nocturnal enuresis was not known.

**Table 3:** Classification according to type of Enuresis

| Type of enuresis  | Male (%)   | Female (%) | Total (%)   |
|-------------------|------------|------------|-------------|
| Nocturnal         | 115 (90.6) | 82 (94.3)  | 197 (92.1)  |
| Diurnal           | 1 (0.7)    | 1 (1.1)    | 2 (0.9)     |
| Nocturnal/Diurnal | 11 (8.7)   | 4 (4.6)    | 15 (7.0)    |
| Total             | 127        | 87         | 214 (100.0) |

### Discussion

The prevalence of enuresis of 23.2% in primary school children aged 6-12 years in Port Harcourt found in this study falls within a wide range of 4% to 40% reported in earlier studies.<sup>1-4,13-21</sup> Specifically, it is similar to the 21.3% prevalence reported by Iduoriyekemwen et al<sup>13</sup> in Edo State Nigeria among children aged 5-16 years and 25% reported by Famuyiwa<sup>20</sup> among school children in Lagos. It contrasts with the lower prevalence rates of 7.6%, 9.2% and 12.9% reported from epidemiological studies in India, Korea, and Turkey respectively.<sup>1,2,9</sup> The different definitions of a case of enuresis as was used in this study compared with the earlier studies may explain the lower prevalence rates obtained. For example, the Indian study defined enuresis as bedwetting for at least two nights a week in children aged 6-12years.<sup>2</sup> This stricter definition of enuresis when compared to the present study will result in a lower prevalence of enuresis in the Indian study. Differences in the age of the study population may also contribute to this lower prevalence. For example the Korean study by Lee et al<sup>9</sup> excluded children who were 6 year old, and since prevalence of enuresis reduces with increasing age, a lowered prevalence is not surprising. Many studies from Asia<sup>1,2,9</sup> showed a lower prevalence of enuresis. Genetic predisposition to enuresis is a known fact but racial relationship is uncertain.

This present study showed that enuresis was more prevalent in males and in the younger age group, with a decreasing prevalence as the age increases. This finding is similar to that observed in previous studies.<sup>1-16</sup> This higher prevalence in males may be due to delayed functional maturation of the reported central nervous system (CNS) in males when compared to females<sup>4,21</sup> which reduces the ability of the child to inhibit bladder emptying at night.

The preponderance (92.1%) of nocturnal enuresis and low prevalence of diurnal enuresis reported in this study is similar to that reported by Iduoriyekewen NJ et al<sup>14</sup> in Ehor community, Edo state, who reported 91% for nocturnal enuresis and no strict case of diurnal enuresis. The difference in the prevalence of combined nocturnal/diurnal enuresis in this study of 15% and 9% in Ehor study respectively may be due to the smaller sample size of 300. Primary nocturnal enuresis constituted 92.0% of all nocturnal enuresis and this is similar to findings from other studies.<sup>12,14,15</sup>

In conclusion, the study has shown that enuresis is common in primary school children aged 6-12 years in Port Harcourt City. It was commoner in males than females and the prevalence decreased with increasing age. Primary nocturnal enuresis is the predominant type of enuresis in the study population. It is recommended that greater attention should be paid to the early identification and management of this condition by health professionals.

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