Texila International Journal of Public Health
ISSN: 2520-3134
DOI: 10.21522/TIJPH.2013.10.01.Art002

Socio Demographic Profiles of Enuresis among Primary School Children

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Abstract

Enuresis is defined in many different ways, but the common thread to all involves a lack of bladder control after 5 years of age, an age when most children would be expected to have achieved bladder control. Nocturnal enuresis is best regarded as a condition with different etiologies. Many aetiological theories have been proposed, with the cause of nocturnal enuresis now regarded as heterogeneous. This was a cross-sectional, descriptive study of primary school children aged between 6-12 years. The study was conducted in Borno State in the northeastern part of Nigeria, West Africa. The sample size is 560, with 260(52.1%) males and 239 (47.9%) females. The ages of the respondents ranged from 6 to 12 years, with a mean age of 9.47 years and a Standard Deviation (SD) of ±1.85. Nine variables, namely age, gender, home environment, maternal education/occupation, paternal education/occupation, family size, and family history of enuresis among siblings at 95% CI were considered. The variables that have a significant relationship with enuresis when the chi ^{2} test was used were further subjected to logistic regression analysis. The children's sex, age group, family history, fathers' education, and occupation were found to have statistical significance in predicting bedwetting among children. Health educators and primary care health staff should obtain detailed history not to miss patients with enuresis, and parents should be informed about the psychological effects of Enuresis and to seek appropriate treatment for their children.

Keywords*: Children, Demographic, Enuresis, Nigeria, Socio-demographic.*

Introduction

Enuresis is defined in various ways, but the most common definition is a lack of bladder control after 5 years of age, an age when most children would be expected to have achieved bladder control [1]. Diurnal enuresis, on the other hand, is defined as wetting while awake after the age of 3 years here the bedwetting occurs all the time, while asleep or awake.

The disorder is a source of concern to many pediatricians, as the cause is difficult to explain to the parents of these children [2], many among them would even hesitate to accept primary nocturnal enuresis as a disorder, thus some people view enuresis as simply an additional milestone to be achieved by the child [2].

The aetiology of enuresis is multi-factorial, with the most prominent factor being a maturational delay of the central nervous system and psychosocial factors. Some studies show that enuresis may accompany other organic conditions such as diabetes mellitus, urinary tract infection, spina bifida, sickle cell disease [3], or chronic renal failure [4].

DSM 1V gave a similar criterion for the diagnosis of enuresis with added clarity if the behaviour is clinically significant as manifested by either a frequency of bedwetting of twice a week for at least 3 consecutive months or the presence of clinically significant distress or impairment in social, academic, or occupational areas of functioning in the child, to make a diagnosis of the disorder. The behaviour should also not be due to the direct physiological effect

Received: 25.12.2021 ***Accepted: 05.01.2022*** ***Published on:30.03.2022***
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of drugs such as diuretics or a general medical condition such as diabetes, spina bifida or seizure disorder [5].

Enuresis is a common disorder and is known to cause some difficulty and distress to children and their parents [6, 7]. Some of the affected children may develop low self-esteem [8]. Enuresis can also cause important social and psychological disturbances among school children, and previous studies have shown bedwetting children to be socially maladjusted emotionally unstable with poor academic performance [9].

Children who bed wet experience different effects such as feeling cold on waking up, sleep disturbances, being teased by siblings or punished by parents, and having high emotional stigmata [10]. Although historically, it was believed that physical punishment by parents like spanking was the normal way of making the older children to stop bedwetting, punishments like teasing, public humiliations, and restrictions, whether actual or done to threaten the child, are counterproductive [10]. Rather, the use of encouragements of self-reliance helps the child's own natural and native development to acquire the ability to sleep dry successfully at night. Experts agree that if parents understand bedwetting as not the child's fault increases the child's willingness to take part in dealing with the problem [11].

Nocturnal enuresis has disturbed humans for centuries. It was known as a problem in the *Papyrus Ebers*, 1550 B.C. Then the concept of nocturnal enuresis rarely exists except in a few medical texts of the time; pronouncing the concept brought merit to its problematic nature. Glicklich, in 1951, described the various cruel methods of treatments used in the past that are barbaric with ultimate futility [12].

In Jordan, Hazza and Tarawneh in 2002 reported a prevalence of 23.8%, the disorder was commoner in boys than girls, with associated family history among 50.5% and low socio-economic status among 67.3% [13] In the same location, other scholars reported prevalence rates of 8% and 15% [13].

In Turkey, a prevalence rate of 12.4% was reported by [2], they found a statistical relationship between enuresis and the child's age, and also a relationship between Enuresis and the number of family members. They reported a higher prevalence in females than males. This gender predilection was attributed to the fact that girls in Turkish families were assigned more responsibilities at home than boys. A prevalence of 13.7% (of which 51.1% were males, and 48.9%. were females) was reported by [14] in the same environment, indicating a male preponderance. This is attributed to the low educational level of parents of these children.

The prevalence of the disorder among children in Taiwan was reported to be 6.8%, with male to the female prevalence of 8.0% and 5.5%, respectively. The prevalence at 6years was 12.5% and 2.0% at 12 years of age; this figure is similar for both urban and rural areas and is closely related to the reports seen in some western countries [15]. In Australia, [16] reported prevalence of 18.9% for nocturnal enuresis, among this, only 34% have sought proper treatment from a health worker, rather, the problem was being managed mainly within the family.

In the Netherlands the prevalence of nocturnal enuresis was 15% in the 5–6-year-old group and 1% in the 13–15-year-old group [17]. A Strong relationship is seen between age and the prevalence of the disorder. Prevalence of 7.2% among 6-year-old children and 2.8% among 9-year-old children was also reported by Trombetta in 1997. Generally, the disorder decreases with age [6].

The prevalence of enuresis was higher in families of low socio-economic class [18]. Parental low educational status, both maternal and paternal educational status, were found to be associated with nocturnal enuresis [2]. Mono symptomatic Enuresis was more common in the children of unemployed mothers, while diurnal

enuresis was more common in children of unemployed fathers [2].

The prevalence of enuresis was associated with the mothers' social class [19]. Low maternal education has been reported as the main risk determinant among subjects with enuresis by several studies, also large family size was also found to be associated with nocturnal enuresis [20].

Aetiology and Risk Factors

Nocturnal enuresis is a condition with multiple and or different etiologies [21]. Patho-physiological mechanisms such as genetics, maturational delay, role of sleep, anti-diuretic hormone (ADH), bladder capacities, psychosocial problems, and diet have been postulated [22]. Many aetiological theories have been proposed, with the aetiological factors now regarded as heterogeneous [22].

A new model termed 'The Three Systems' has facilitated a greater clinical understanding of the disorder and identification of the appropriate intervention [23]. The three-system model proposes that enuresis results from excessive night-time urine production and/or bladder over-activity, coupled with an inability to wake up from sleep following full bladder sensations [23].

Genetics

A high incidence of primary nocturnal enuresis (bedwetting) exists in children whose parents were enuretic when compared to families with no parental history [24].

The identification of a gene marker has confirmed the hereditary cause of PNE, the existence of a dominant gene located on chromosome 13 and another gene on chromosome 12 were also suggested [24, 25]. In most studies, fathers were more often affected than mothers, which is consistent with the fact that nocturnal enuresis is more common in boys than girls [24, 25].

Recently identified genes EnuR1 and EnuR2 further indicate that enuresis may be inherited [25]. An ENUR3 gene was also identified on chromosome 22. Presumably, the identification of these genes may help in identifying risk for developing enuresis in these children or may indicate children who will need attention to urinary function prior to bedtime [23] in the case of PNE, a single recessive gene is suspected [25]. If both parents had enuresis; the child has 77 % chance of having the condition, if one parent had enuresis; the child has a 44% chance of developing the condition [26].

In Sweden, a study of the inheritance patterns of the disorder among 392 children with primary nocturnal enuresis, showed 168 (43%) of the children had an affected parent; 37 (9.4%) had an affected sibling, taken to indicate the presence of an autosomal recessive inheritance [27]. Genetics play a major role in the expression of the disorder since the disorder is significantly greater in first-degree relatives. Although no specific gene locus has yet been identified, the identification of this gene marker certainly lifts the burden of guilt from children who have enuresis and helps to dispel the theory that enuresis is behavioral in origin [9].

Reduced Bladder Capacity

Children with nocturnal enuresis show frequent uninhibited bladder contraction and a lower functional bladder capacity as indicated by Urodynamic studies [28]. Although these findings have been disputed by other researchers [29], some parents report symptoms suggesting a small bladder capacity in children with enuresis, and this condition is usually accompanied by daytime bedwetting, bladder ultrasonography, and voiding cysto urethrography can be done to further evaluate for PNE and urinary bladder infection [30]. Other studies revealed that only 15% of those with isolated nocturnal enuresis had reduced bladder capacities, while the rest, 97% had both nocturnal and diurnal enuresis [31].

Most sleep studies using sleep cytometries could not link nocturnal enuresis with unstable bladder contraction or a decrease in bladder

capacity [32]. An increase urge to urinate with less quantity of urine in the bladder was seen in some children with enuresis who have a normal bladder capacity than in children without enuresis. Bedwetting occurs more in the presence of high levels of the anti-diuretic hormone at night [32].

Abnormal secretion of the antidiuretic hormone at night may be a significant factor in the aetiology of nocturnal enuresis in some children, although studies of gene markers do not correlate with abnormalities of antidiuretic hormone function [25].

Maturational Delay

The most commonly accepted cause of nocturnal enuresis, but also the most difficult to prove, is delayed functional maturation of the central nervous system, which reduces the child's ability to inhibit bladder emptying at night [30]. The child's bladder will fill, but the sensory output resulting from the stretching of the bladder is not perceived or is not sent to the brain, and thus, central cortical control over the urinary sphincter contraction does not occur. Failure of the arousal mechanism may also contribute to the inability to inhibit micturition [30].

Role of sleep

Children with nocturnal enuresis suffer from alteration in arousal from sleep in response to the sensation of a full bladder [33]. A transition from one sleep stage to another during deep sleep has been postulated. This presumption was based on the theory that enuretics demonstrate a lack of cerebral inhibitory control of reflex voiding during deep sleep [34]. [35] found that deep sleep was significantly more frequent among enuretic children compared with non enuretics. Others dispute this position but hold the view that enuresis does not appear to be related to a specific stage of sleep or time of the night rather bedwetting appears randomly [36].

In general, the quality of their sleep is normal, but some evidence however indicates that children with enuresis sleep more soundly than other children [34].

Enuresis with Obstructive Sleep Apnoea Syndrome

Nocturnal enuresis has also been associated with children who have upper airway obstruction and surgical relief of the obstructive lesion such as those seen following tonsillectomy, adenoidectomy, or both adenotonsillectomy was reported to diminish nocturnal enuresis in up to 76 percent of patients [37, 38].

Endocrine Factors

Urine output follows a circadian rhythm in normal individuals, resulting in the decrease of urine production at night. Non enuretics show an increase in their night-time plasma levels of antidiuretic hormone arginine vasopressin (ATV) [39]. This hormone is normally excreted from the pituitary gland, and its function is to enhance water reabsorption, thereby leading to the production of a smaller volume of concentrated urine at night. Lower nocturnal secretion of serum antidiuretic hormone (ADH) is seen in children with nocturnal enuresis when compared to controls. These children have lower mean nocturnal urine osmolarities and higher mean urinary excretion rates [32].

Psychological Factors

Nocturnal enuresis was once thought to be caused by psychological conditions. It now appears that psychological problems are the consequences of enuresis. Children with nocturnal enuresis have been found to have an increased incidence of emotional problems. For most children, bedwetting is not an act of rebellion [40]. Psychosocial stressors are also seen to be more in children and adolescents with disruptive behaviours and enuresis [41].

Werry and Cohrssen in 1965 stated that, among children with primary nocturnal enuresis, the incidence of psychopathology was relatively infrequent and that there is no convincing evidence that most of these children suffered from psychoneurosis [42]. Schmitt, in 1997

stated that the onset of secondary enuresis may be brought about by emotional or psychological disturbances in the family, for example, divorce, death, illness, emotional or physical trauma, or the birth of a new sibling [43]. Psychosocial stressors appear to precipitate enuresis in a subgroup of children with the disorder. In young children, the disorder has been particularly associated with the birth of a sibling, hospitalization between the ages of two and four, the start of school, the breakup of a family because of divorce or death, and a move to a new home [43].

Many medical studies state that the psychological impact of bedwetting is more important than the physical considerations [44]. It is often the child's and family members' reaction to bedwetting that determines whether it is a problem or not [44]. Psychological theories through the 1960s placed much greater focus on the possibility that a bedwetting child might be acting out, purposely getting back at parents by soiling linens and bedding.

More recent research and medical literature state that this is very rare [40]. Studies showed that punishing or shaming a child for bedwetting will frequently make the situation worse. Doctors describe a vicious cycle where a child punished for bedwetting feels shame and a loss of self-confidence. This can cause increased bedwetting incidents, leading to more punishment/shaming, with "an escalating cycle of wetting accidents and shame." [40]. Other factors associated with aetiology are the presence of attention deficit hyperactivity disorder and diet. Esperanca and Gerard, in 1969, noted that some children benefited from eliminating certain foods such as caffeine, sugar, citrus fruits, juices, dairy products, artificially coloured foods, drinks, and chocolates especially in the afternoon [45].

Despite numerous studies on primary nocturnal enuresis, its aetiology remains elusive. The condition appears to be multi factorial, thus further complicating the therapeutic approach [30].

Treatment

Clear history obtained in the initial voiding stage may give clues about the best choice of treatment. The child who frequently voids during the day (seven times or more), voids small amounts, has few or no dry nights during the week and wets the bed more than once a night is more likely to have low functional bladder capacity [46]. This child may benefit most from the use of a bedwetting alarm. On the other hand, the child who has a normal voiding pattern during the day voids large amounts at night and wets only one to two nights per week may have nocturnal polyuria and therefore may be an appropriate candidate for Desmopressin therapy.

A child who fails one treatment modality may benefit from another treatment. The following evidence-based interventions have been found to be helpful:

1. Enuresis Alarms
2. Dry Bed Training
3. Positive Reinforcement System
4. Tricyclic Antidepressants
5. The use of Desmopressin

Relevance of the Study

In Nigeria, physical punishment and shaming of children with enuresis has been a common practice. A similar practice was found in several other studies, 61% of American parents view bedwetting as a significant problem, and about one-third of these parents dealt with it by punishment [47]. Historically Punishment and public humiliation were very common [47]. Unfortunately, parents still punish their children for wetting the bed. The present study will provide important information on the socio-demographic profiles of enuresis among primary school children in Maiduguri. The general objective of this study is to: Assess the socio-demographic correlates of enuresis.

Methodology

This was a cross-sectional, descriptive study of the socio-demographic profile and the risk

factors among primary school children aged between 6-12 years.

Study Location

The study was conducted in Borno State in the northeastern part of Nigeria, West Africa; the State has borders with Niger, Chad, and Cameroon, and similar cultural heritage with the Chad Republic. The state has a total population of about 4 million.

The prevalence rate of nocturnal enuresis in Nigeria among 6–12-year-olds was reported to be 17.6% in Igbo Ora, a rural community in southwestern Nigeria [48].

Thus, the sample size was calculated using 17.6% as the prevalence for this environment and at a confidence rate of 95% as follows [49].

$$N = \frac{z^2 pq}{d^2}$$

N = the desired sample size
Z = standard normal deviation set at 95% confidence interval = 1.96
p = prevalence of the disorder in the target population = 17.6% = 0.176, Approximately = 0.18
d = degree of accuracy desired set at 5% = 0.05 q = 1.0- p = 1 – 0.18 = 0.82 N = 226.7

$$N = \frac{n}{A_r}$$

n_s = compensated sample size
n = calculated sample size = 226.7
a_r = anticipated response rate set at 80% = 0.8

Therefore, ns = 227/ 0.8= 284 approximately 280 students. However, because of the very large numbers of students in the Government schools compared with the private and Islamiyya schools in some of the wards, it was anticipated that the number of students selected in the Private schools and Islamiyya schools would be too small for analyses, especially parametric statistical analyses. To improve the precision and the power of estimate, the total sample size was doubled to 560.

Sampling Procedure

A multi-stage sampling method was used. Maiduguri Metropolitan Council (MMC) is divided into fifteen (15) political wards**.** Appendix 1 contains the list of the wards in Maiduguri.

The total number of primary schools in Maiduguri Metropolitan Council is one hundredth and forty-four (144), comprising of:

1. Thirty-six (36) Government Primary Schools.
2. Forty-two (42) Islamiyya Primary Schools.
3. Sixty-six (66) Private primary Schools.

The total numbers of pupils in Maiduguri Metropolitan Council are as follows:

Government primary	-	45,357
Islamiyya schools	-	18, 136
Private primary schools	-	27,720

The ratio of the overall student populations, therefore = 5:2:3.

Therefore, in order to ensure proportional representation of students from the various types of schools, the sampling proceeded as follows:

Stage 1

This involved selecting the wards within Maiduguri for the study. One-third of the wards were selected randomly. The five wards selected were: Bolori 11, Fezzan, Gwange1, Lamisula, and Maisandari wards.

Stage 2

In this stage, the selection of schools for the study was conducted. One Islamiyya School, one Government primary school, and one private primary school were selected from each ward. The total sample size was divided into five, and an equal number of samples was allocated to the five wards. The table below contains the list of all the schools in each selected ward and their student populations. Among them, only the students at the underlined schools participated in the study.

The sample was allocated in a ratio of (5) for Government schools, (2) for Islamiyya Schools,

and (3) for Private schools. Thus, the total desirable sample of 560 was made up of 280 subjects from Government schools, 112 subjects from Islamiyya schools, and 168 subjects from private primary schools. There are more private schools than government or Islamiyya schools in each ward, even though the average number of students in each private school is small.

Stage 3

This involved the selection of pupils from the schools selected in each ward. A total of 115 pupils were sampled from each ward allocated in the ratio of 5 for Government school, to 2 for Islamiyya School to 3 for Private school. This yielded 57 pupils from each Government school, 23 from each Islamiyya, and 35 from each Private school. Thus, the total desirable sample of 560 was made up of 280 subjects from Government schools, 112 subjects from Islamiyya schools, and 168 subjects from private primary schools.

In each school, the class registers of pupils from classes 1-6 and arms A-E were obtained. Subjects were selected from the class registers using a sampling interval computed as follows:

The pupils were selected irrespective of their gender.

$$\text{The sample interval} = \frac{\text{Total no of students in the school register (class } 1-6 \text{ A} - \text{E)}}{\text{Total number of subjects required}}$$

Procedure

The selected schools were visited by the researcher for introduction to the school authorities the purpose of the study. Consent and permission were obtained from the school authorities and the parents of the selected children prior to the interview. The purpose of the interview was clearly explained to all. A parent consent form was given to all the selected children to take home to their parents for approval.

The children were then interviewed on a one-to-one basis individually. They were assured of the confidentiality of their identity and responses, and the interview was conducted in the school premises. Forty-one percent 41% (204) parents have also interviewed, for example, those parents that accompanied their children to school, parents of selected children who work in the school premises as (teachers, cleaners etc.,) and those parents who responded to the consent request form and came. The interview was conducted only on school days, using the following instruments.

Socio-demographic and Clinical Variables Questionnaire

A socio-demographic and clinical questionnaire was designed to gather relevant information concerning the children such as the name and type of school they attend, their age, sex, presence of similar problems among their siblings, frequency of bedwetting, whether they are living with both parents or not, their parent's background (educational status, income, and occupational status). Number of family members, their parents' awareness of the problem and the methods of treatment used so far. The occupational status was coded using the ILO (ISCO-08) (ILO Geneva, 1990).

Clinical interview

A short structured clinical interview (eliciting a history of enuresis voiding pattern, associated factors such as dysuria, frequency, sleep patterns, family history, and the child's clinical state) was done. Adequate clinical examination was done to rule out severe physical conditions such as spina bifida, severe urinary tract infection, and diabetic Mellitus. Urine analysis for glucosuria and urine microscopy (for blood) urine culture and sensitivity were conducted on all the suspected cases.

The Schedule for Affective Disorders and Schizophrenia, Present and Lifetime (KSADS-PL Version 1.0)

The Schedule for Affective disorders and Schizophrenia, Present and Lifetime version 1.0

Oct 1996 (K-SADS-PL) is a semi-structured diagnostic interview schedule [50] designed to assess current and past episodes of psychopathology in children and adolescents (between the ages of 6-18 years) according to DSM 111–R and DSM-IV criteria.

It was modified from the K-SADS, which itself is developed from the revision of the adult's Schedule for Affective disorders and schizophrenia (SADS) for use in children and adolescents [50]. It is divided into five diagnostic supplements.

The K-SADS-PL uses a scoring scale that ranges from 0-2. A score of 0 indicates that no information is available; a score of 1 suggests that enuresis is not present; a score of 2 represents bed wetting present. It has been used extensively in various cultures, including Nigeria, with demonstrated reliability and validity. It is administered by interviewing the parent(s) or the child and finally achieving ratings which include all the sources of information (parent, child, school, chart, and others [51].

Data Management and Analysis

The data obtained were entered using micro soft Excell and analysed using the Statistical Package for Social Sciences, version sixteen (SPSS-16), software.

The children were separated into two groups.

1. Those diagnosed as enuretic by KSADS, and
2. Those not so diagnosed by the KSADS.

The two groups were then compared on the various socio-demographic, and clinical variables indicated earlier. Results were presented using descriptive statistics, the mean age of subjects were obtained and subjected to t-test. Each variable was subjected to a Chi-square test to see the level of significance at a P-value of 0.05.

Results

Out of a total of the targeted 560 primary school children, 499(89%) were interviewed. Despite the adequate sample size, the respondent rate was low among the Islamiyya pupils because they operate in the evenings to allow some of the children to attend western schools in the morning.

Socio-Demographic Profile of the Subjects

Gender and Age

The study population was made up of a total of 260 (52.1%) males and 239 (47.9%) females. The ages of the respondents ranged from 6 to 12 years, with a mean age of 9.47 years and a Standard Deviation (SD) of ±1.85. The respondents within the age bracket of 6-9 years were 236(47%), while 263(53%) were aged 10-12years of age. See Figure 1. Most of the children were living with their both parents, as seen in 119(26.4%) of the children with enuresis and 331(73.6%) of those without enuresis, 7(53.8%) live with either their mother alone or with their grandparents, the disorder is slightly lower among those living with their father alone with 9(90.0%) of them non enuretic, and 1(10%) were enuretic, generally, living with both parents has not shown to be of statistical significance with (χ^2=10.4, P= 0.11). See Table 1.

Parental Educational and Occupational Status

Islamiyya education was commoner among mothers of children with enuresis, as seen among 58(27.4%) of them, while secondary and tertiary education was seen among 29(23.2%) and 18(27.7%), respectively, those that had no education at all were 15(32.6%).

Similarly, 51(29.5%) of fathers of the children with enuresis had only Islamiyya education, while secondary education and tertiary education were seen among 39(28.1%) and 19(19.2%) of the fathers, respectively. This association of enuresis with father's education was found to be statistically significant (χ^2=15.1, df = 6, p=0.02). When the occupational status of the parents was classified into the high occupational status and low occupational status according to professionalism and skills the rate

of enuresis among children of mothers with high occupational status and those with low occupational were similar. The rate was 21(29.6%) for children whose mothers had high occupational status and for children of mothers with low occupational status the rate of enuresis was 116(27.2%). Most of the women were service and sales workers in market and shops 60(43%), and only 8(5.8%) were professionals.

Mother's occupational status was not found to be statistically significant at (χ^2=1.8, p=0.39). The relationship between paternal occupation and child's bedwetting is statistically significant (χ^2=16.8, df = 13 and p=0.02).

Among children of fathers with high occupational status, enuresis was seen to be 26(19.3%) and 109(80.7%) were non enuretics, while among children whose fathers were of low occupational status, enuresis was 111(30.5%).

Table 1. Gender, Age and Home Environment as Socio Demographic Correlates of Enuresis (N=499)

Socio demographic Variables	**with Enuresis n (%)**	**without Enuresis n (%)**	χ^2	**P value**
Gender				
Male	89(34.2)	171(65.6)	11.8*	<0.001**
Female	48(20.1)	191(79.9)		
Age in years				
6-9	103(43.6)	133(56.4)	57.4*	<0.001**
10-12	34(12.9)	229(87.1)		
Home environment of child with whom the child is living				
Both parents/ Either parent	119(26.4)	331(73.6)	3.3	*0.2*
Mother only	7(53.8)	6(46.2)		
Father only	1(10.0)	9(90.0)		
With Grandparents	7(43.8)	9(56.2)		
Aunt	2(40.0)	3(60.0)		

Statistically significant **

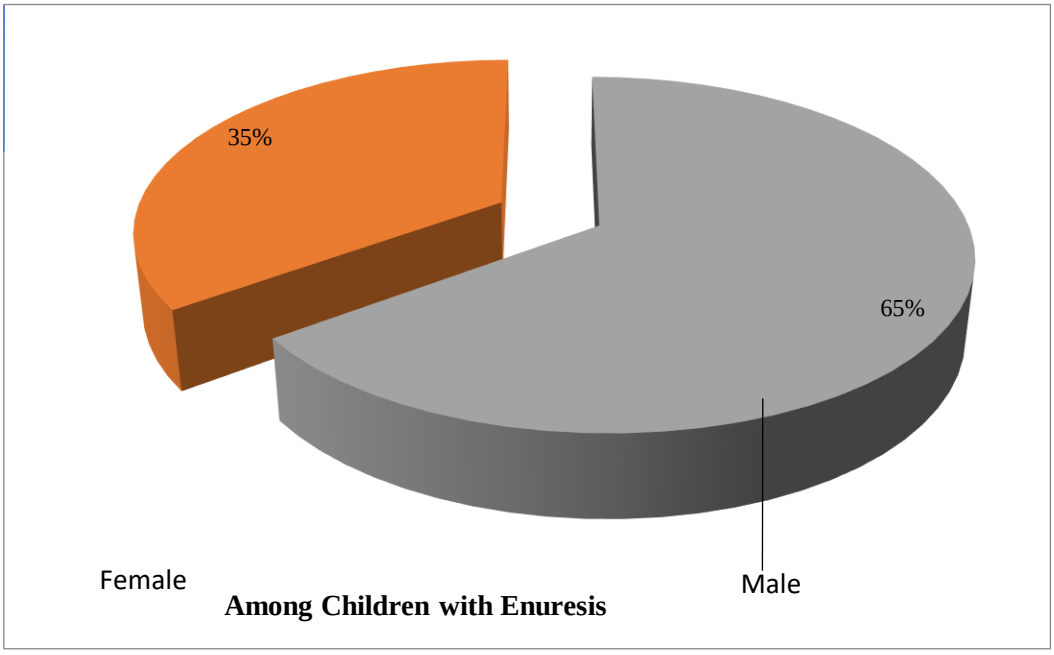

Figure 1. Sex Distribution Among Children with Enuresis

Table 2. Family History, Family Size, and the Type of School in Relation to Enuresis (N=499)

Socio demographic Variables	with Enuresis n (%)	without Enuresis n (%)	χ^2	P value
Family History				
No Family History	24(18.4)	105(81.4)	6.6	0.01**
Positive Family History	112(30.4)	257(69.6)		
Family size				
0-10	114(29.1)	278(70.9)	2.4	0.5
11-20	17(21.3)	63(78.8)		
21-30	4(26.7)	11(73.3)		
41-50	0(0)	1(100)		
School type				
Private primary school	119(26.4)	117(73.6)	2.0	0.4
Islamiyya school	29(23.6)	98(76.4)		
Government school	66(30.4)	151(69.6)		

Statistically significant **

Religion, Type of School and Parents' Wellbeing

Four Hundred and fifty-nine of the respondents (92%) were Muslims, while only 40 (8%) were Christians. Most of them were from public schools representing 217 (43.5%), followed by Private Schools with 159 (31.9%) and Islamiyya schools with 123 (24.6%). Four hundred and fifty respondents (90.2%), live with both parents and 466 (93.4%) have both parents alive and well. Parents were divorced in about 12 (2.4%) of them, and 21 (4.2%) had at least one parent deceased.

Parents Educational and Occupational Status

Most of the children's parents had only Quranic or Islamiyya education, as seen among 212(42.5%) of all the mothers and 173(34.7%) of all fathers, followed by secondary education with 125(25.1%) for the mothers and 139(27.9%) among the fathers. See Table 1.

Mothers with tertiary education were only 65(13%), while 33(6.6%) had no education at all. Among the children's fathers, those with tertiary education were 99(19.8%).

The occupations of the children's parents were similar; 192(38.5%) of the mothers were housewives with elementary occupation, 159(31.9%) were service and sales workers in the markets, shops, and at homes as traders, or cooks, only 23(4.6%) were professionals.

Most of the fathers, too, were service and sales workers, representing 198(39.7%); 28(5.6%) were professionals, and 17(3.4%) were in the armed forces. When the parental occupational status was divided into low and higher occupational status, there was a marked difference among the three types of schools. Parents of children attending government schools had the highest level of low occupational status with 181(83.4%). Similarly, the parents of children attending Islamiyya schools had 91(74%) low occupational status. High number of parents with higher occupational status, 67(42%) was seen among parents of children attending private schools. See Table 1.

Family History and Family Size

Positive history of bedwetting among first degree relations was found among 112(30.4%) of the children with enuresis and 257(69.6%) among children with no history of bedwetting, for those with no family history of bedwetting, 24(18.6%) had enuresis, and 105(81.4%) had no enuresis. This association of enuresis with family history was statistically significant (χ^2=6.6, and P=0.01). The odds of having

enuresis were significantly higher for children with a positive family history of bedwetting among their siblings. (OR=1.9, 95% CI, 1.1-3.1).

Among all the children interviewed (N=499), there was a positive family history of enuresis in 369 students (73.9%), with more students reporting a positive history among male siblings then among female siblings. Younger brothers' bedwetting among 191(38.3%), 21(4.2%) reported older brothers bedwetting and 92(18.4%) and 3(0.6%) said younger sisters and senior sisters' bedwetting respectively.

Among the 204(41%) parents interviewed, past history of bedwetting was seen only among 20(4%), 119(23.8%) of the parents had no history of childhood enuresis, while 349(69%) of the children reported having no knowledge of their parents past history of bedwetting.

The number of family members of the children were classified into those with 0-10 family members (among them 114(29.1%) were enuretic, and 278(70.9%) were non enuretics).

Those with 11-20 family members (among these groups, 17(21.3%) were enuretic, and 63(78.8%) were non enuretic). Those with 21-30 family members 4(26.7%) were enuretic, and 11(73.3%) were non enuretic), and one person without enuresis was from a family with 41-50 members. Family size was not found to be of statistical significance (χ^2=2.4, and P=0.5). See Table 2.

Factors Predictive of Enuresis among the Children

After a review of the socio-demographic and clinical correlates of enuresis, nine variables, namely age, gender, home environment, maternal education/occupation, paternal education/occupation, family size, and family history of enuresis among siblings at 95% CI were considered. The variables that have a significant relationship with enuresis when the chi ^{2} test was used were further subjected to logistic regression analysis. The children's sex, age group, family history, fathers' education, and occupation were found to have statistical significance in predicting bedwetting among children. See Table 3.

Table 3. Linear and Logistic Regression Analysis for variables significantly associated with Enuresis

Variable	β (Beta co-efficient)	Odds Ratio	95% C. I	SE (St. Error)	P-Value
Male sex	-775	0.48	(0.32-0.73)	0.23	0.01**
Age group	- 1.60	0.19	(0.12-0.3)	0.23	0.00**
Family History	0.67	1.90	(1.16-3.13)	0.27	0.02**
Fathers Education	0.12			0.07	0.08**
Fathers' occupation	0.54	1.84	(1.14-3.0)	0.27	0.02**
Constant	0.53			0.69	0.45

Statistically significant **

Discussion

The socio-demographic variables tested here in relation to Enuresis are age, gender, ethnicity, family size, family history of enuresis, parents' educational status, and occupational status. In Jordan Hazza and Tarawneh, reported the prevalence of enuresis among 6-year-old to be 48.9%, 21.1% among 7-year-old and 8.4% at 8 years of age, they acknowledge the prevalence to be greater than that prevalence obtained from other Asian or European countries, they attributed these occurrences of high prevalence to the low socio-economic status of parents in Jordan [13].

Strong association exists between enuresis and family history of bedwetting, the occurrence of enuresis is even higher with a positive history of the disorder among siblings. Several studies showed that association to be of statistical

significance. In this study, 74% of the total respondents had a family history of bedwetting among their siblings; and 30.4% of the subjects with positive family history were enuretic. Similar results were seen in the Ehor community study in Nigeria. That found a strong association of enuresis with a family history of the same morbidity among siblings, with statistical significance.

Heredity was showed to be a strong causative factor for Primary nocturnal enuresis, with the confirmed identification of a gene marker on chromosome 13 [25]. In several of these studies, affectation is more with the children's father than the mother, which is consistent with the fact that nocturnal enuresis is more common in boys than girls.

However, no specific gene locus has yet been identified. The identification of this gene marker in children who have enuresis helps to dispel the theory that enuresis is behavioural in origin. Perhaps this will encourage more parental commitment in seeking the appropriate medical care for these affected children.

More than two-thirds (83%) of the children in Government (public) schools have fathers with lower occupational status, similar to those in Islamiyya schools, while about half (42%) of the fathers of the children in Private schools have higher occupational class. Several reports have shown a strong association of enuresis with low socio-economic status. The report of the increased prevalence of bedwetting children in Jordan is due to the low socio-economic status of their parents [13]; also, other studies have found a similarly high prevalence of enuresis in families with low socio-economic class [18].

Father's educational status was also found to be a significant factor among children of the 3 different types of schools. Tertiary and secondary education were found among 36.5% and 37.7% of fathers of children in Private schools, while for those in Government (public) schools their fathers mostly (45.6%) had Quranic/Islamiyya education; 28.6% had secondary education and 11.5% had no education at all. Parents of the Islamiyya school children stand in between these two; greater percent (49.5%) had Quranic/Islamiyya education, 18.6%, and 13.8% had tertiary and secondary education, respectively.

The relationship of the father's occupational/educational status with the significant association found with enuresis may be a reflection of the socio-economic status of the families rather than a direct causal effect. This is because; the majority of the mothers are housewives, with the fathers predominantly serving as the breadwinners.

Parental low occupational status affects the children in several ways, including lack of a conducive academic environment. For example, the population of children per public (Government schools) was between the range of 700-6000, with 50-100 pupils per class. The class levels extend up to K, L, and sometimes M. Inspite of regulations by the financial supporter UBE (universal basic education) scheme of UNICEF, to limit the number of pupils per class to, less than 50. There are a few public schools (precisely 36), in a densely populated environment. This is not so among private schools. There are more than 65 within the metropolis, and their student concentration per school is within the range of 400-900, with 30-40 children per class. Most parents cannot afford the cost, leaving them with the few government schools to rush their children to. There was a remarkable enthusiasm among these children to be interviewed. This eagerness would no dough have enhanced their truthfulness in providing answers to the questions. The Child Right Acts of Borno State, although yet to be fully enacted, stipulate that child less than 14 years should not be interviewed without the consent of the parent. The researcher had to wait until the parent's consent was obtained before interviewing these children. A Study [19] showed that the prevalence of enuresis was associated with the mother's social class. Low maternal education has been reported as the main risk determinant among subjects with enuresis by several studies

[19], a similar picture is seen in Iran and Turkey [52] and [14]. This was not found in this study. Maternal education was not statistically related to enuresis because 85% of all the mothers had low educational status, 42.5% had only Quranic education, while only 13% had tertiary education. The World Bank Report of Gross National Income and Female Education rate was reported to be lowest in the north-eastern part of Nigeria, the location of the present study. With a Girl-child education enrolment rate of 20% for the northeast, 25% for the northwest, 75% for the southwest, and 85% for the southeast. This shows the glaring difference between the rate of the study location and the rest of the country [53].

Maternal education, home environment, and family size have been described as risk factors for enuresis in several other studies. Hanafin found that, in large families, nocturnal enuresis was quite prominent. This was not found to be statistically significant in this study. This could probably be attributed to the fact that most of the children in this study. (Those with enuresis and those without enuresis) reported large numbers of family size, ranging from 1-10, 10-20, 21-30, and up to 40. As a result, no difference or significance was observed between the two groups. The association of enuresis with large family size, as described by other scholars, is also striking [20].

This could be linked to the fact that having more children in the household might make it more difficult for parents to give individual attention and monitoring, including toilet training to these children. The application of Logistic regression analysis to all the clinical variables obtained showed a significant relationship between enuresis and lower age, male sex, paternal education, and occupational status, and positive history of bedwetting among siblings. The Odds that enuresis will occur more common among boys than in girls was 0.48, using the risk estimate analysis also, those with a positive history of enuresis among siblings have 1.907 increase predispositions to the disorder. See Table 3. Several horrific methods of dealing with the disorder exist, such as punishment and public humiliation as seen in a study of enuresis by Miller in Philadelphia in 1993, hence family education about the problem is crucial. Optimism about the potential for improvement in bedwetting from the physician can help and at the same time giving the child the responsibility of achieving nighttime bladder control.

In this study, the results showed that 19% of the parents do nothing about bedwetting as a problem, 10% resort to traditional medications, 4.2% employed punishment for the child. Only 2.4% seek for proper medical treatment. Health education program in primary health care settings is necessary to inform parents about the proper treatment of the disorder.

Enuresis, as an entity, can result in psychological and interpersonal distress in the individual, and the idea that bad children wet their beds deliberately is a myth [43].

Conclusion

Often children with primary nocturnal enuresis are labelled, punished, and even teased. The humiliation they feel may be exhibited in behaviours that may lead to labelling the child wrongly. Despite these children's attempts (successful or otherwise) to hide the fact that they wet the bed, they are usually emotionally affected by the problem to some degree at some stage in their development. Therefore, health educators and primary care health staff should be educated to get a full history not to miss patients with enuresis, psychological effects, and information about treatments available should be explained to these parents.

Acknowledgement

I am happy to make this dream a reality; I appreciate these children who volunteered to work with me to make this article a reality.

Conflict of Interest

Author declares that there is no Conflict of interest in the study.

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