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Original research
Published by OJS
Doi: doi.org/10.4314/tmj. v31i1.325
OPEN ACCESS JOURNAL

# Nocturnal enuresis among children in Morogoro region in Tanzania: A cross-sectional survey

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**Abstract**

***Background***
Enuresis is common childhood disorders which affecting quality of life of children and causing significant psychosocial disturbances to children and their families. This condition has been widely reported globally with increasing data from sub-Saharan African region. In Tanzania there is no reports on its magnitude and therefore this study was carried out with the aim of determine the prevalence of this condition among children in Tanzania.

***Methods***
This was a community based cross-sectional study conducted among children aged between 5 and 14 years recruited from 12 streets in Morogoro Municipality in Tanzania. Standardized Swahili questionnaire was used to collect data including socio-demographic details of parents, children and presence of enuresis. Socio-demographic data included age of the child, sex, level of education of the parents, education of the child, presence of bed wetting, history of enuresis in the family.

***Results***
Five hundred and ten children were recruited into this study out of which 271 (53.1%) were females and mean age of study participants was 9±2.8 years. Enuresis was noted in 19% (97/510) of children, 68% (66/97) and 32% (31/97) had primary and secondary enuresis respectively. Significantly higher prevalence rates of enuresis were noted for children aged below 8 years 26.4% (43/162) and those with family history of enuresis 47% (18/38) with p values of 0.01 and < 0.001 respectively. Forty-one (42.3%) out of 97 respondents whose children had enuresis reported to have punished their children and only 21.4% (20/97) reported to have sought treatment for their children.

***Conclusions***
Enuresis is common among children in Tanzania particularly those with positive family history. Punishment to children with enuresis was noted in this study and only one in five parents/guardians sought treatment for their affected children. Therefore, there is a need for initiatives for raising community awareness about enuresis in Tanzania

***Key words:*** Enuresis in children, prevalence of enuresis in Tanzania, factors affecting enuresis in children.

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## Background

Enuresis is common conditions which result in significant social and emotional distress to affected children and their families. It is involuntary passage of urine during sleep and according to Diagnostic and Statistical Manual for Mental Health (IV) at least twice weekly bed-wetting for three consecutive months defines enuresis. [1] There are two forms of enuresis (primary and secondary), primary enuresis is bed wetting in a child aged 5 years or above who has never been dry, while secondary enuresis occurs in children who have attained continence. Primary enuresis is the most common form of enuresis accounting for about 60-80% of all cases. [2,3].

Prevalence of this condition has been reported to range between 8% and 30% in children. [2-6] Higher prevalence rates have been reported in children with other comorbid conditions including sickle cell anaemia. Esozobor et al and Eneh et al reported prevalence rates of 49.4% and 31.4% respectively, for children with sickle cell anaemia in Nigeria. [3, 5]

The exact cause of primary enuresis is largely unknown, however several factors have been reported to contribute; these include nocturnal polyuria, abnormal circadian release of growth hormone and vasopressin, small bladder capacity, and impaired arousal to full bladder when sleeping. [7-10] Attention deficit hyperactivity disorder (ADHD) and obstructive sleep apnoea are reported to contribute. [10] Enuresis is also linked to psychosocial factors including dysfunctional families, living with parents with health problems and poor socio-economic status. [11-14]

There is scarcity of data on this condition in sub-Saharan Africa, affecting resource allocation for appropriate treatment and addressing accompanying psychosocial effects on affected children. Timely and appropriate treatment for enuresis is influenced by several factors including parents' understanding on disorder and availability of treatment as well as knowledge and skills of health care providers, both of these factors are informed by knowledge of the magnitude of this disorder. [15]

This study was conducted to determine the burden of enuresis and its associated factors in Morogoro, Tanzania.

**Methods**

This was community based cross-sectional study conducted in 12 streets located in three wards (Kihonda, Chamwino and Bigwa) in Morogoro municipality in Tanzania. Four streets were selected from each ward and a total of 510 children were recruited from households located in the selected streets between August and September 2014. Ethical approval and permission for conducting this study were provided by Muhimbili University of Health and Allied Sciences (MUHAS) Institutional Review Board and Morogoro Municipality respectively. Informed consent was sought from parent/guardian of each participant prior to recruitment. Children with chronic debilitating neurological, urological and renal disorders were excluded from this study.

Standardized Swahili questionnaire was used to collect data, which included socio-demographic details of parents, children and presence of enuresis. Socio-demographic data included age of the child, sex, level of education of the parents, education of the child, presence of bed wetting, history of enuresis in the family. Other information included birth weight of the child, birth order and school performance of children. In this study enuresis was defined according to DSM (IV) criteria [1]

Collected data were entered into Statistical Package for Social Sciences (SPSS) version 20, data cleaning was carried out before data analysis, and data were summarized into frequency distribution tables, association between categorical variables was determined using Chi-square test and p-value of <0.05 was considered statistically significant.

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## Results

### *Socio-demographic characteristics*

A total of 510 children were recruited, out of which 271 (53.1%) were females. Sixty-seven children (13.1%) were aged 7 years, while 62 (12.2%) and 63 (12.4%) were aged 8 and 10 years respectively. The mean age of study participants was 9 ± 2.8 years. Majority of children 328 (91.6%) were delivered with normal birth weight and 155 (30.6%) were first born. Four hundred and fifteen children (81.4%) were attending school. Majority of respondents 281 (74.7%) in this study were parents. (**Table 1)**

### *Prevalence of enuresis*

Enuresis was noted in 19% (97/510) of all study participants, 68% (66/97) had primary enuresis while 32% (31/97) had secondary enuresis. Among children with enuresis 49 (50.5%) were males, **Figure 1**.

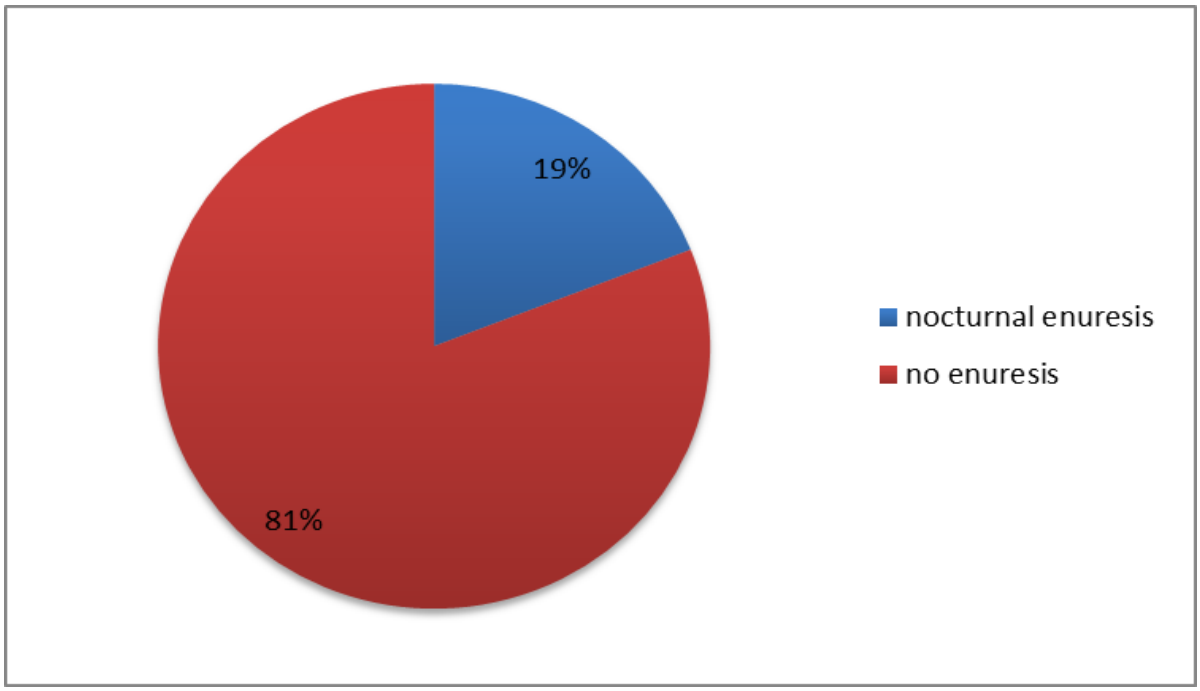


**Figure 1: Pie chart showing prevalence of nocturnal enuresis**

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**Table 1: Demographic data of the study participants**

| Variable | N (%) |
|---|---|
| Age (years) | |
| 5 | 37(7.3) |
| 6 | 58(12.4) |
| 7 | 67(13.1) |
| 8 | 62(12.2) |
| 9 | 44(8.6) |
| 10 | 63(12.4) |
| 11 | 36(7.5) |
| 12 | 38(7.5) |
| 13 | 53(10.4) |
| 14 | 52(10.2) |
| Mean | 9±2.8 |
| Sex | |
| Male | 239(46.9) |
| Female | 271(53.1) |
| Birth weight | |
| Low birth weight | 369(91.6) |
| Normal birth weight | 34(8.4) |
| Birth order | |
| First born | 155(32) |
| Non first born | 329(68) |
| Schooling | |
| Yes | 415(81.4) |
| No | 95(18.6) |
| Respondents | |
| Parent | 281(74.7) |
| Guardian | 128(25.1) |
| **Total number of study participant** | **510** |

***Factors associated with enuresis***

Findings of this study showed no difference in the occurrence of enuresis between male (20.5%) and female (17.7%) children, p=0.24. Children aged below 8 years were noted to have higher prevalence of enuresis 26.4% (43/162) as compared to those aged 8-10 years and > 10 years who had prevalence of 17.2% (29/169) and 14% (25/179) respectively, p=0.01. Children with family history of enuresis were more likely to get enuresis 47% (18/38) as compared to those without 16.8% (78/463), p <0.001. **Table 2**

**Table 2: Factors associated with enuresis in children**

| Variable | Enuresis n (%) | Total n | p-value |
|---|---|---|---|
| Sex of child | | | |
| Male | 49 (20.5) | 239 | |
| Female | 48 (17.7) | 271 | 0.24 |
| Age of child (years) | | | |
| 5-7 | 43 (26.4) | 162 | |
| 8-10 | 29 (17.2) | 169 | |
| >10 | 25 (14.0) | 179 | 0.01 |
| Birth order | | | |
| First born | 32 (20.6) | 155 | |
| Non- first born | 63 (19.1) | 328 | 0.39 |
| Birth weight | | | |
| Normal | 369 (18.7) | 369 | |
| Low | 6 (17.7) | 34 | 0.55 |
| Family history of enuresis | | | |
| Yes | 18 (47.4) | 38 | |
| No | 78 (16.8) | 463 | 0.00 |

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***Perception and response to enuresis***

Twenty parents 21.4% (20/97) of children with enuresis sought treatment, out of which 80% (16/20) sought treatment from traditional healers while four reported to have visited hospitals. Punishment to children was reported by 42.3 % (41/97) of parents who had children with enuresis.

School performance was reported to be satisfactory for 55 (56.7%) with enuresis while 40 (41%) children with enuresis were reported to have poor performance at school. Majority of children with enuresis (81.7%) were reported to have limited visits to relatives or friends especially where sleep over was required. Fifty-three (54.6%) of respondents whose children had enuresis perceived it as minor disorder which would resolve spontaneously while 45.4% considered it to be a serious condition.

## Discussion

This study was conducted among children aged between 5 years and 14 years in a community setting in Morogoro municipality, Tanzania to determine the burden of enuresis in Tanzanian children. Ninety-seven children (19%) were noted to have enuresis in this study. It is evident from the findings of this study that enuresis is a common problem in Tanzanian children as it is reported from other reports globally. Fockema et al in a study carried out in South Africa children reported enuresis in 16%, [16] while Eneh et al reported a prevalence of 21.4% among school children in Nigeria. [5] Higher prevalence of 29.6% was reported by Esozobor et al in a study conducted in Nigeria using different criteria for defining enuresis. [3]

Out of 97 children with enuresis 68% (66/97) had primary enuresis while 32% (31/97) had secondary enuresis. These findings are consistent with reported global epidemiological reports. [2, 3, 17]

Children were equally affected regardless of gender in this study; enuresis was noted in 20.5% and 17.7% among males and female children respectively. Although

not significant statistically, there was slightly higher prevalence of enuresis in males. Several studies have reported higher prevalence of enuresis in boys as compared to female and this has been attributed to slow or delayed maturation of brain bladder axis as well as toilet training in boys. [5, 6, 18, 19]

Younger children were noted to have higher prevalence of enuresis in this study, and there was a sharp decrease in the prevalence as age of children increased from 26.4% among those aged 5-7 years to 14% among those aged above 10 years. This has been widely reported globally. The reason for this trend of outgrowing enuresis is yet to be determined; it has been postulated to be due to immaturity of the brain bladder axis. [20]

From the findings of this study, occurrence of enuresis was not influenced by birth order or weight. No difference was noted for enuresis between according to birth or as was the case for between those children who were born with low weigh and normal weight. Gunes et al [2] and Yousef et al [21] reported similar findings of no difference in enuresis among children based on their birth order.

Children from family with history of enuresis were noted to have higher prevalence of enuresis as compared to those without in this study, this phenomenon, which has been widely reported from other studies supports the role of genetics in childhood enuresis. [2,4,6,17] Several ‘enuresis genes’ have been described, some with autosomal inheritance pattern with penetrance of up to 90%. [20, 22, 23]

A small proportion of respondents reported to have sought treatment for enuresis in this study, with more than 40% reporting to have punished children with enuresis. Reports from other studies have documented parents not willing to seek treatment for their children and also using punishment as a way of addressing this condition. Schlomer et al reported a higher proportion of parents (55%) willing to seek treatment for their children compared to our finding, and a very few (2 %) reporting punishing their children compared to 43% from our study. [24]

Enuresis related punishment noted in this study indicate lack of awareness among respondents and the community, this approach which has negative effects on children development has been reported from several other studies globally. [6, 25, 26] It is therefore important to have initiatives aimed at increasing awareness on causes, natural history and treatment options for enuresis in Tanzanian community. Informed community will be in a better position to deal with psychosocial effects of enuresis including poor performance in school and limited ability of children to interact with others as indicated in this and other studies. [27]

## Conclusions

Enuresis is common among children in Tanzania as noted with prevalence of 19%. Younger children and those with family history of enuresis were noted to have higher prevalence of enuresis. Punishment of children with enuresis was reported among parents with enuresis and treatment for enuresis was sought for one out of five children with enuresis. Therefore, it is important to conduct wider surveys in other regions of Tanzania and to conduct community awareness campaign about enuresis to improve perception of parents/guardians and health seeking behaviour for this condition.

## List of abbreviations

ADHD; Attention Deficit Hyperactivity Disorder
DSM; Diagnostic and Statistical Manual
MUHAS; Muhimbili University of Health and Allied Sciences

## Declarations

### Ethical approval and consent for participation

Ethical approval for this study was provided by MUHAS ethical committee, parents/guardians provided consent for participation into this study.

**Consent for publication**

Not applicable

**Availability of data**

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

**Competing interests**

Authors declare that they have no competing interests.

**Funding**

This study was partly funded by Ministry of Sciences, Technology and Higher Education

**Authors' contributions**

FF and NK designed the study and NK collected data and wrote the initial report. FF wrote the manuscript of this study.

**Acknowledgements**

We acknowledge the support provided by parents and caretakers during data collection.

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