Frequency of enuresis and related factors among school children in Guilan province; a single center investigation

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ABSTRACT

Introduction: Enuresis is one of the most common diseases in children that has several physical and psychosocial effects on children and their parents. Enuresis is classified in primary and secondary groups which depends on various factors such as genetic predisposition, biological and developmental, psychological, social and economic factors.

Objectives: This study aimed to determine the prevalence of enuresis in primary school-aged children and the role of related personal and family factors in Rasht.

Patients and Methods: In this cross-sectional study, samples were randomly selected from Rasht's primary schools. Questionnaires were selected for each student and then completed by a health expert with invitation of a parent.

Results: In this study, 1125 questionnaires were completed that 568 (50.5%) were boys and 557 (49.5%) were girls. The study showed that the prevalence of enuresis was 7.5% (n = 43) in boys and 4.1% (n = 23) in girls and overall is 5.9% (n = 66). The gender difference was statistically significant. There was statistically significant relation in two groups about personal factors such as history of urinary tract infections (UTIs), snoring, computer games and eating fast food and family factor such as family history of enuresis and the place of residence.

Conclusion: The results showed that the prevalence of this disorder was lower than other studies, which it may be because of ethnic and cultural differences among the communities. Our results with enuresis prevalence and associated factors were comparable to other epidemiological studies from various countries.

Implication for health policy/practice/research/medical education: Enuresis is one of the most common diseases in children that has several physical and psychosocial effects on children and their parents. This study aimed to determine the prevalence of enuresis in primary school-aged children and the role of related personal and family factors. In this study personal and social factors such as history of urinary tract infections, snoring, computer games and eating fast food and family factor such as family history of enuresis and the place of residence were significant predictors of enuresis.

the DSM-IV criteria as bedwetting for at least two nights a week. Primary enuresis was defined as bedwetting in a child who had never had bladder control for a period longer than 6 months. Questionnaires were selected for each student and then completed by a Health expert with invitation of a parent.

**Ethical issues**

1) The research followed the tenets of the Declaration of Helsinki; 2) informed consent was obtained; and 3) This study was approved by the Ethics Committee of Guilan University of Medical Sciences.

**Statistical analysis**

Data analysis was done in SPSS software using chi-square test. P< 0.05 was considered significant.

**Results**

In this study, 1125 questionnaires were completed that 568 (50.5 %) were related to boys and 557 (49.5%) related to girls. Of these, the most frequent age in children was 10 years old with 245 cases (21.8%) and the least frequent age was 12 years old with 105 cases (9.4%) and the average age of children was 8.8±3.2 years. This study showed that enuresis prevalence was 7.5% in 43 boys and 4.1% in 23 girls. Among children with enuresis, 2.5% (29) wet their bed two or more times per week. Additionally, 4.7% (53) of these children had urine incontinency during the day. Table 1 shows age frequency in children. The result of study showed no significant difference in enuresis between children (P= 0.627).

Table 2 shows personal factors associated with enuresis such as academic position, history of urinary tract infection (UTI), neonatal jaundice, breast feeding, febrile convolution, constipation, tonsillectomy, snoring, involving with computer games and fast food consumption. The table shows a significant different between the history of UTI, snoring, computer games and fast food consumption in two groups (P= 0.001, P= 0.045, P= 0.025 and P= 0.003 respectively).

**Table 3** shows familial factors associated with enuresis such as history of enuresis in family members, education levels, death, occupation and parental divorce status. This table shows a significant relationship between enuresis in fathers, mothers and sisters of subjects (P=0.001, P= 0.007 and P= 0.001 respectively).

**Discussion**

This is a community based study that determines 5.9% enuresis prevalence and related factors among 7-12 years old in Rasht. Similar studies in some provinces have 18.7% of prevalence (5) that was more than our study. Enuresis prevalence studies of other countries were 15.6% (6), 9.4% (7) that prevalence was less in our study. According to the studies, it seems that the prevalence of enuresis is less in primary school students of Rasht in comparison with several areas of the world (8,9). Findings showed that the prevalence of enuresis were more common in boys (7.5%) in comparison with girls (4.1%) (10-12).

Remarkably a significant relationship between enuresis and positive family history in fathers, mothers and sisters was detected.

Recently, a systematic review and meta-analysis conducted by Makrani et al displayed the relationship between enuresis and positive familial history in nine studies. Seven of these studies, reported that presence of positive familial history is a predictive factor (13). Several studies detected that, if one parent is enuretic, each child will have 44% risk of enuresis.

**Table 1.** The frequency of enuresis in related to age

<table>
<thead>
<tr>
<th>Age (y)</th>
<th>With enuresis</th>
<th>Without enuresis</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
<td>6</td>
<td>158</td>
</tr>
<tr>
<td>8</td>
<td>17</td>
<td>7.5</td>
<td>208</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>4.5</td>
<td>193</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
<td>7</td>
<td>228</td>
</tr>
<tr>
<td>11</td>
<td>9</td>
<td>5</td>
<td>170</td>
</tr>
<tr>
<td>12</td>
<td>4</td>
<td>3.7</td>
<td>102</td>
</tr>
<tr>
<td>Total</td>
<td>66</td>
<td>5.9</td>
<td>1059</td>
</tr>
</tbody>
</table>

**Table 2.** Individual factors related to enuretic patients (n = 66)

<table>
<thead>
<tr>
<th>Variable</th>
<th>With underlying factor, No. (%)</th>
<th>Without underlying factor, No. (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child educational status</td>
<td></td>
<td></td>
<td>0.989</td>
</tr>
<tr>
<td>Good</td>
<td>49 (5.2)</td>
<td>894 (94.8)</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>16 (9.7)</td>
<td>149 (90.3)</td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>1 (5.9)</td>
<td>16 (94.1)</td>
<td></td>
</tr>
<tr>
<td>Jaundice</td>
<td>28 (42.4)</td>
<td>38 (57.6)</td>
<td>0.076</td>
</tr>
<tr>
<td>Breast feeding</td>
<td>53 (80.3)</td>
<td>13 (19.7)</td>
<td>0.293</td>
</tr>
<tr>
<td>History of urinary tract infection</td>
<td>9 (13.6)</td>
<td>57 (86.4)</td>
<td>0.001</td>
</tr>
<tr>
<td>Febrile seizures</td>
<td>6 (9.1)</td>
<td>60 (90.9)</td>
<td>0.057</td>
</tr>
<tr>
<td>Constipation</td>
<td>5 (7.5)</td>
<td>61 (92.5)</td>
<td>1</td>
</tr>
<tr>
<td>Tonsillectomy</td>
<td>4 (6.1)</td>
<td>62 (93.9)</td>
<td>1</td>
</tr>
<tr>
<td>Snoring</td>
<td>12 (18.2)</td>
<td>54 (81.9)</td>
<td>0.045</td>
</tr>
<tr>
<td>Computer games</td>
<td>62 (93.9)</td>
<td>4 (6.1)</td>
<td>0.025</td>
</tr>
<tr>
<td>Fast food</td>
<td>45 (68.1)</td>
<td>21 (31.9)</td>
<td>0.003</td>
</tr>
</tbody>
</table>
and if both parents are enuretic, the child will have 77% likelihood of enuresis (1, 14).

In this study a significant relationship between enuresis and parent's education level was detected. This finding is similar with other studies in different countries (15, 16). Probably, educational and cultural level in parents has a pivotal role in toilet training and attention to health of children and also familial problems handling and as a result, enuresis control.

Other related factors are scary computer games and hearing or viewing scary scenes that in this study is statistically significant. In the study by Eqemen et al, computer games and their applications had a significant relation with enuresis (14).

Likewise, this study showed a significant relationship between nocturnal enuresis and snoring. While tremendous controversy exists about relationship between nocturnal enuresis and adenoid hypertrophy, however, in the study of Aydin et al in Turkey no significant relationship between enuresis and adenoid hypertrophy was detected (18). Accordingly, the study of Bahktiar et al showed, statistically significant relationship between nocturnal enuresis and deep sleep (19). Cinar et al reported a cure rate of 63% for nocturnal enuresis following adenoidectomy for upper airway obstruction in 74 children. Other findings of this research show no significant relation between enuresis and factors like age, father's and mother's job and parent's divorce.

Our study also showed, the prevalence of enuresis in children living in rental home in comparison with children living in personal home is significant (P=0.010). Importantly, case group children have more UTI history than control group. Other studies also suggest that recurrent UTI can lead to dysfunction of bladder sphincter and urine incontinency in children (21, 22). Vande Walle et al found a significant relationship between UTI history and nocturnal enuresis. Therefore it is necessary to conduct routine laboratory tests in asymptomatic and sick children especially older children according to rule out UTI (4).

Awareness of patient's families about prevention, evaluation and treatment of children with UTI in order to control this complication seems to be necessary.

### Conclusion

In summary, enuresis prevalence has less rate in Rasht in comparison with some provinces in the country and also other countries. Results achieved from enuresis and familial and personal factors in this research is comparable with other countries' epidemiological studies.

### Limitations of the study

One of the most important limitations of this research was lack of response some parents for various reasons to our questionnaire.
Acknowledgments
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Authors’ contribution
ASA, AH, AK and SM contributed to design and conducted the research. AK performed data gathering, data interpretation and preparation of manuscript. AS, AH analyzed the data. All authors prepared the manuscript read, revised, and approved the final manuscript.

Conflicts of interest
The authors report no conflicts of interest. The authors declare that there is no conflict of interest regarding the publication of this article.

Ethical considerations
Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

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