

# Study on risk factors and its influence on, psychology, and sleep in adolescent with primary enuresis in China

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## ABSTRACT

Most epidemiological surveys target children, with relatively few surveys of adolescents. Research on the psychological and sleep aspects of PNE in adolescents is rare [1]. We investigated the prevalence, related factors, and psychosocial impact of nocturnal enuresis (PNE) in adolescents aged 12 to 18 years by an epidemiological survey.

## METHODS

From September 2020 to December 2022, a stratified, cluster random sampling method was used to conduct an epidemiological survey of 6408 junior and senior high school students in a certain area of Henan Province. The survey contents included: basic information, whether there is frequent urination, urgency of urination, urinary incontinence, recurrent urinary tract infection (RUTI), enuresis questionnaire, self-esteem scale (SES) Pittsburgh sleep quality index (PSQI), etc. The inclusion criteria for PNE are those who begin enuresis in early childhood and have involuntary urination more than once a month at night after being older than 5 years of age [2]; The exclusion criteria were obvious organic disease, physical disability, incomplete questionnaire filling, age less than 12 years or older than 18 years. To analyze whether the prevalence of PNE in adolescents is related to factors such as gender, residence, body mass index (BMI), frequency of urination, urgency of urination, urinary incontinence, RUTI, and family history of enuresis. In addition, the psychological problems of adolescent PNE patients were analyzed.

## RESULTS

The overall prevalence of PNE among adolescents aged 12 to 18 years was 2.98% (191/6408), with prevalence rates of 4.67%, 4.09%, 3.67%, 2.97%, 2.27%, 1.65%, and 1.37% for each age. The prevalence gradually decreased with age. The prevalence was 3.70% in males and 2.26% in females, with a significant difference ( $P < 0.05$ ). The prevalence of BMI  $\geq 25\text{kg/m}^2$  was 5.43%, and the prevalence of BMI  $< 25\text{kg/m}^2$  was 2.72%, with a significant difference ( $P < 0.001$ ). The patients with frequent urination accounted for 9.13%, while those without frequent urination accounted for 2.72%, with a significant difference ( $P < 0.001$ ). There was a significant difference between 5.20% with urgency and 2.51% without urgency ( $P < 0.001$ ). There was a significant difference between 14.47% with urinary incontinence and 2.70% without urinary incontinence ( $P < 0.001$ ). The patients with RUTI accounted for 8.59%, while those without RUTI accounted for 2.75%, with a significant difference ( $P < 0.001$ ). There was a significant difference between 9.46% with a family history of enuresis and 2.52% without a family history of enuresis ( $P < 0.001$ ). The prevalence rate was 2.96% in urban areas and 2.99% in rural areas, with no significant difference ( $P = 0.948$ ). (Table 1) Multivariate logistic regression analysis of statistically significant factors in Chi-square analysis showed that male, overweight, urgency to urinate, frequency of urination, urinary incontinence, RUTI, and family history of enuresis ( $OR = 1.677, 1.842, 1.676, 1.919, 3.493, 2.535, 3.005, P < 0.05$ ). The scores of the self-esteem scale in PNE patients were lower than those in non-PNE groups [28(25,32) vs 29(27,33),  $z = -3.097, P < 0.05$ ]; Compared with the non-PNE group, the Pittsburgh sleep index in the PNE group was higher than that in the non-PNE group [5(3,7) vs 4(2,6),  $z = -5.456, P < 0.05$ ]. (Table 2)

## CONCLUSIONS

The prevalence of PNE among adolescents is high, and gradually decreases with age. Male, overweight, frequent urination, urgency, urinary incontinence, RUTI, and family history of enuresis are risk factors for PNE. PNE has adverse effects on self-esteem and sleep quality in adolescents.

Table 1. The prevalence and risk factors for PNE in adolescents

Variable	n	PNE		$\chi^2$	P
		Yes n(%)	No n(%)		
Gender				11.485	0.001
Male	3185	118(3.70)	3067(96.30)		
Female	3223	73(2.26)	3150(97.74)		
Residence				0.004	0.948
Urban	2598	77(2.96)	2521(97.04)		
Rural	3810	114(2.99)	3696(97.01)		
BMI				13.909	<0.001
<25kg/m <sup>2</sup>	5800	158(2.72)	5642(97.28)		
$\geq 25\text{kg/m}^2$	608	33(5.43)	575(94.57)		
Frequency				35.810	<0.001
Yes	263	24(9.13)	239(90.87)		
No	6145	167(2.72)	5978(97.28)		
Urgency				22.958	<0.001
Yes	1116	58(5.20)	1058(94.80)		
No	5292	133(2.51)	5159(97.49)		
urinary incontinence				71.116	<0.001
Yes	152	22(14.47)	130(85.53)		
No	6256	169(2.70)	6087(97.30)		
Past history of UTI				29.052	<0.001
Yes	256	22(8.59)	234(91.41)		
No	6152	169(2.75)	5983(97.25)		
Family history				65.674	<0.001
Yes	423	40(9.46)	383(90.54)		
No	5985	151(2.52)	5834(97.48)		

PNE, primary nocturnal enuresis; UTI, urinary tract infection

Table 2. SES and PSQI scores between the PNE and non-PNE groups

Score	Gender	PNE (n=191)	non-PNE (n=6217)	Z	P
SES	Male	28(25,32)	30(27,33)	-2.28	0.022
	Female	28(25,31)	29(27,33)	-2.08	0.038
	Total	28(25,32)	29(27,33)	-3.10	0.002
PSQI	Male	5(3,7)	4(2,5)	-4.59	<0.001
	Female	5(4,7)	4(2,6)	-3.14	0.002
	Total	5(3,7)	4(2,6)	-5.46	<0.001

PNE, primary nocturnal enuresis; SES, Self-Esteem Scale; PSQI, Pittsburgh sleep quality index

## REFERENCES

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 [2] Nevés T, Fonseca E, Franco I, et al. Management and treatment of nocturnal enuresis-an updated standardization document from the International Children's Continence Society. *J Pediatr Urol*. 2020;16(1):10-19.