

Habitual snoring, risk factors and symptoms in primary school children



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BACKGROUND

Habitual snoring (HS) is associated with restless sleep, daytime sleepiness, and hyperactive and aggressive behavior in pre-school children¹. Population-based data of symptoms associated with HS in school children are rare. Aim of this study was to obtain the prevalence of habitual snoring in primary school children and to establish associated risk factors and symptoms.

METHODS

- As part of a population-based, cross-sectional study on the prevalence of sleep-disordered breathing (SDB) in primary school children, all children attending the third grade of 27 randomly selected regular primary schools located in Hannover, Germany, were asked to participate.
- Parents were given a 25-item questionnaire concerning signs and symptoms of SDB (e.g., snoring, observed apneas, difficulty breathing during sleep), frequent sleep problems (e.g., sleep onset delays, frequent night wakings, nightmares, sleep walking, enuresis), daytime symptoms (e.g., hyperactivity, concentration deficits, daytime tiredness and sleepiness), health status (e.g., allergies, morning headaches, daytime mouth breathing, sore throat, frequency of infections [i.e., rhinitis, bronchitis, otitis media], history of adenoidectomy and tonsillectomy), and personal factors (e.g., gender, age, weight, height, parental education and smoking).
- Snoring was investigated with the question "Does your child snore?" and was rated on a 4-point scale (i.e., "never", "occasionally", "frequently" or "always"). HS was defined as snoring frequently or always.
- The remaining questions were rated on a 3-point scale (i.e., "rarely", "occasionally" or "frequently").
- Odds ratios (OR) and their 95% confidence intervals (95%CI) were calculated using unconditional logistic regression. Adjustments were made for gender, age, and parental education.

RESULTS

- Of 1144 (65%) questionnaires returned, 585 (51%) were from boys.
- Information on snoring was available for 1129 children (98.7%). Four-hundred-ten children (36.3%) never snored, 605 (53.6%) occasionally snored, and 114 children (10.1%) were reported to snore habitually; one third of these snored loudly or extremely loudly.
- Risk factors:** HS was significantly associated with frequent daytime mouth breathing, frequent infections, allergic/chronic rhinitis, a history of adenoidectomy, obesity (i.e., BMI >90th centile), and parental smoking of >10 cigarettes/day. Logistic regression analysis revealed frequent infections and mouth breathing as the most important risk factors of HS (Table 1).
- Symptoms:** HS was significantly associated with a frequent occurrence of morning headaches, a sore throat, daytime sleepiness, daytime tiredness, concentration deficits, and hyperactivity. Logistic regression analysis revealed morning headaches and a sore throat as the most important symptoms associated with HS (Table 2). Interestingly, also occasional snoring was associated with a frequent occurrence of hyperactivity, concentration deficit, daytime tiredness and a sore throat.
- Sleep problems:** HS was significantly associated only with frequent nightmares (Table 2). There was no other sleep problem associated with HS.

CONCLUSION

- Similar to pre-school children, HS was associated with increased daytime sleepiness, tiredness, hyperactivity and concentration deficits in these primary school children. This might have an influence on the school performance of these children.
- In addition, we found obesity, signs of adenotonsillar hypertrophy (daytime mouth breathing), history of adenoidectomy, frequent infections of the upper respiratory tract, allergic/chronic rhinitis and parental smoking of >10 cigarettes/day as risk factors of HS in these primary school children.

Risk factors of habitual snoring

Risk factor	Definition	NS		HS		OR	95%CI
		n	%	n	%		
History of adenoidectomy	yes	75	18.7	34	30.6	1.9	1.1-3.0
Parental smoking	>10 cig/day	268	2.4	45	39.5	1.9	1.1-3.1
BMI	> 90 th centile	265	26.1	48	42.1	2.3	1.4-3.7
Allergic/chronic rhinitis	yes	31	8.1	16	15.2	2.4	1.2-4.7
Frequent infections	>8x/year	36	3.7	20	17.5	11.0	4.6-26.5
Mouth breathing	frequently	146	14.8	56	50.0	17.9	9.8-32.8

Table 1. Prevalence and adjusted odds ratios of various risk factors according to snoring categories. Abbreviations: NS: never snoring; HS: habitual snoring; OR: odds ratio; CI: confidence interval.

Symptoms of occasional and habitual snoring

	Hyper-activity	Night-mares	Concentra-tion deficit	Daytime sleepiness	Daytime tiredness	Morning headaches	Sore throat
	n	n	n	n	n	n	n
NS	82	8	45	5	8	7	6
	%	20.2	2.0	11.1	1.2	2.0	1.7
OS	169	9	108	6	26	7	19
	%	28.3	1.5	18.0	1.0	4.3	1.2
	OR	1.5	0.9	1.6	0.8	2.2	2.8
	95% CI	1.1-2.1	0.3-2.5	1.1-2.3	0.2-2.8	1.0-5.1	0.2-2.1
HS	42	6	36	9	14	13	29
	%	37.2	5.4	31.9	8.1	12.4	11.4
	OR	2.4	3.3	3.6	6.7	7.6	41.7
	95% CI	1.5-3.8	1.1-10.4	2.2-6.1	2.1-21.5	3.1-19.1	15.8-109.5

Table 2. Prevalence and adjusted odds ratios of various symptoms according to snoring categories. Abbreviations: NS: never snoring; OS: occasional snoring; HS: habitual snoring; OR: odds ratio; CI: confidence interval.

Risk factors and symptoms of habitual snoring

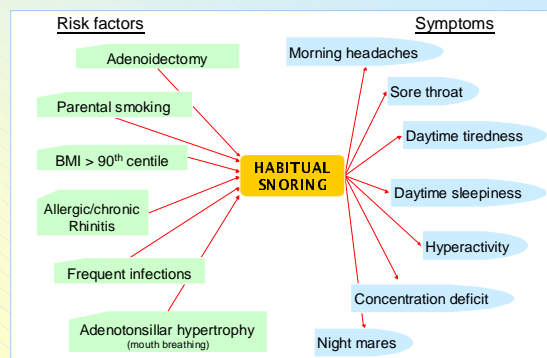


Fig. 1.

References

- Ali NJ, Pitson DJ and Stradling JR. Snoring, sleep disturbance, and behaviour in 4-5 year olds. Arch Dis Child 1993;68:360-366