

## Original Article

# Questionnaire about Snoring

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*These days, oral appliances have recently been attracting attention as a treatment for patients who are diagnosed with habitual snoring or mild or moderate SAS. The clinical usefulness of this treatment has been described in many reports.*

*Since such information has become available to the public, the number of patients with the principal complaint of snoring or apnea during sleep visiting dental clinics on their own initiative or through referral from other medical facilities is becoming more common.*

*In the future, the frequency of administering treatment for snoring is expected to increase, so a questionnaire was conducted to investigate the clinical condition of those who snore.*

*A total of 478 subjects, 81 (17%) stated that they snore every night. Significantly more middle-aged and elderly men snore than young men. 10 questionnaire items, "frequent changes in sleeping position" and "teeth-clenching" were commonly observed in all age groups.*

Key words: Questionnaire, Habitual snoring

## INTRODUCTION

These days, sleep-related breathing disorders are becoming a social concern. Habitual snoring is said to affect nearly 20 million people in Japan.

Of these, nearly 2 million are assumed to have sleep apnea syndrome (SAS) and habitual snoring is considered to indicate the potential for developing SAS; it is a prodromal or associated symptom<sup>1)</sup>.

Oral appliances<sup>2-5)</sup> have recently been attracting attention as a treatment for patients who are diagnosed with habitual snoring or mild or moderate SAS. The clinical usefulness of this treatment has been described in many reports<sup>6-8)</sup>.

Since such information has become available to the public, the number of patients with the principal complaint of snoring or apnea during sleep visiting dental clinics on their own initiative or through referral from other medical facilities is becoming more common.

In the future, the frequency of administering treatment for snoring is expected to increase, so a questionnaire was conducted to investigate the clinical condition of those who snore. The results of the questionnaire are reported in this article.

## MATERIALS AND METHODS

### 1) Subjects

Of 478 individuals, consisting of 264 male students of a university dentistry course and 214 male outpatients of the same university hospital, served as subjects. They were classified according to age as follows: young (19- to 29-year-old, n=327); middle-aged, (30- to 49-year-old, n=98); and elderly, (50- to

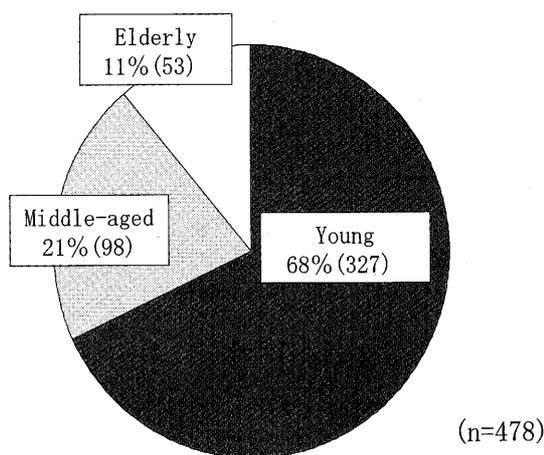


Fig. 1 Distribution of age of study subjects

69-year-old, n=53) (Fig. 1).

### 2) Methods

Subjects were asked to complete the questionnaire by themselves. The questionnaire consisted of 10 items regarding age, height, body weight, presence and frequency of snoring, BMI (body weight / height<sup>2</sup>), teeth-clenching during sleeping, feelings of suffocation, sleeping position, frequent awakening, well-being on waking, daytime drowsiness, high blood pressure, blocked nose, and tonsillar enlargement (Fig. 2). Obesity was defined as BMI  $\leq 25$ .

### 3) Analysis

Those who snored "every night" were categorized as the habitual snoring group (Group S) and compared with a "non-snoring"

**Questionnaire on snoring**

Please answer as many of the following questions as possible  
(Circle the applicable item)

1. Age \_\_\_\_\_
2. Height \_\_\_\_\_ cm
3. Weight \_\_\_\_\_ kg
4. Do you snore during sleep?  
a. Every night, b. Occasionally, c. Never
5. Have you ever noticed or been told that you clench your teeth during sleep?  
a. Yes, b. No
6. Do you feel that you are suffocating (having difficulty breathing, nasal passages feeling blocked) during sleep?  
a. Yes, b. No
7. Are you an untidy sleeper?  
a. Yes, b. No
8. Have you ever woken up frequently during sleep?  
a. Yes, b. No
9. Do you feel bad when you wake up?  
a. Yes, b. No
10. Do you feel drowsy in the daytime?  
a. Yes, b. No
11. Do you have high blood pressure?  
a. Yes, b. No
12. Do you have difficulty breathing through your nose?  
a. Yes, b. No
13. Are your tonsils often swollen?  
a. Yes, b. No

Thank you for your cooperation

Fig. 2 Questionnaire paper

group (Group NS) by age group by performing a chi-square ( $\chi^2$ ) test of independence for every age group.

The number of subjects who answered "Yes" to the items concerning symptoms was expressed as a percentage of each age group, and Friedman's test was performed based on the distribu-

tion of subjects who were categorized in Group S for each item.

## RESULTS

Snoring was reported by 303 subjects (63%). Of these, 81 (17%) reported snoring "every night" and 222 (46%) described snoring "occasionally". One hundred seventy-five answered that they "do not snore" (Fig. 3).

Regarding snoring by age group, proportions of subjects in Group S and Group NS were 12% (n=39) and 44% (n=145), respectively in the young group; 27% (n=26) and 30% (n=16) respectively in the middle-aged group; and 23% (n=23) and 13% (n=7) respectively in the elderly group (Fig. 4).

$\chi^2$  test of independence demonstrated that significantly more subjects from the middle-aged and elderly groups snored habitually than in the young group (Fig. 5).

Fig. 6 indicates the results of Friedman's test that was performed based on the distribution of subjects who were categorized in Group S for each item using the percentage of those who

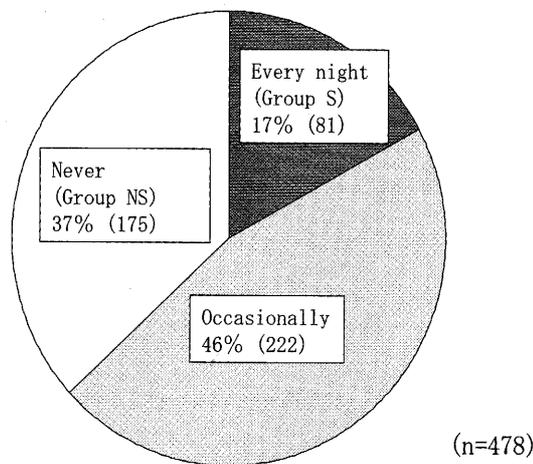


Fig. 3 Occurrence and frequency of snoring

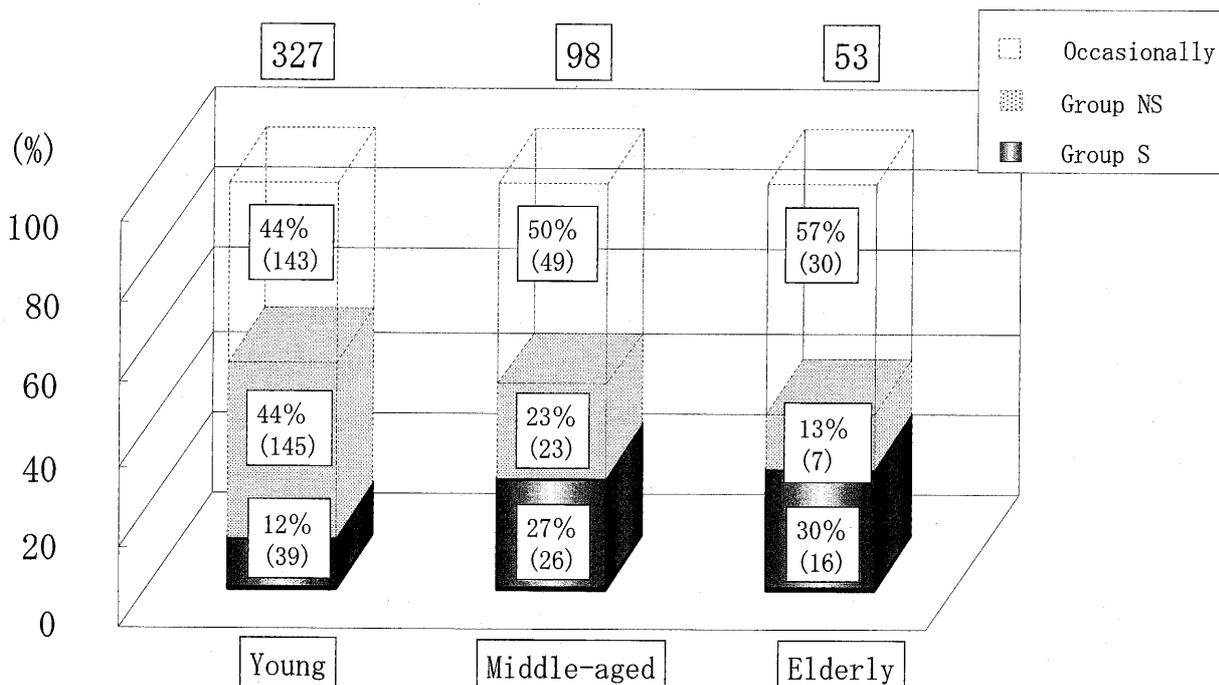


Fig. 4 Habitual snoring by age group

	Young	Middle-aged	
Group S	39	26	65
Group NS	145	23	168
	184	49	233

$$\chi^2 = 25.897$$

	Young	Elderly	
Group S	39	16	55
Group NS	145	7	152
	184	23	207

$$\chi^2 = 24.516$$

	Middle-aged	Elderly	
Group S	26	16	42
Group NS	23	7	30
	49	23	72

$$\chi^2 = 1.754$$

$$\chi^2 = \frac{(ad-bc)^2 N}{(a+b)(c+d)(a+c)(b+d)}$$

	Young	Middle-aged	Elderly
Young		*	*
Middle-aged	*		NS
Elderly	*	NS	

\* : p < 0.01  
 NS : Not significant

Fig. 5 Result of  $\chi^2$  test of independence

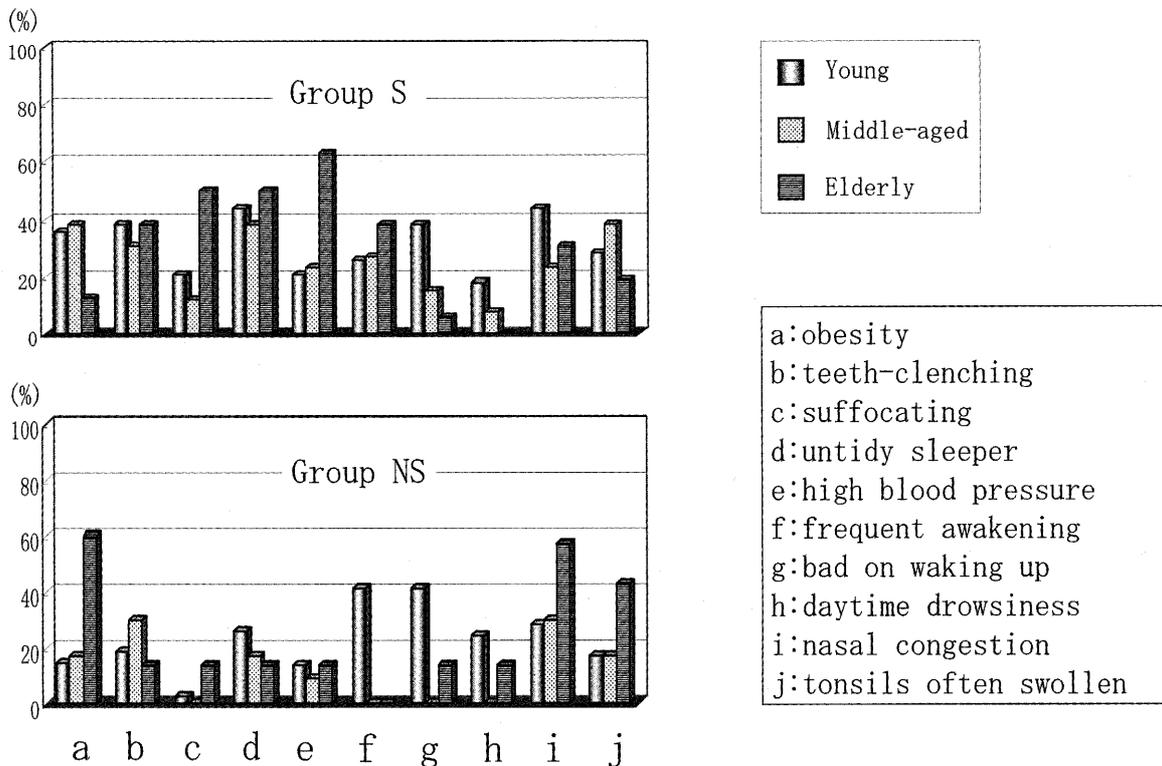


Fig. 6 Distribution of age by study item

answered "Yes" to the items concerning symptoms. No significant difference was observed between the age groups and it is therefore suggested that no specific difference existed between

generations within the range of items covered by the present study.

Of those who were categorized in Group S, "sleeping posi-

tion", "nasal congestion", "teeth-clenching", and "obesity" were frequently reported in the young group; "sleeping position", "tonsillar enlargement", "obesity", and "teeth-clenching" were often mentioned in the middle-aged group; and "high blood pressure", "feeling of suffocation", "sleeping position", "teeth-clenching", and "frequent awakening" were commonly noted in the elderly group. Items regarding "sleeping position" and "teeth-clenching" were frequently reported in all age groups.

## DISCUSSION

The purpose of the study was to investigate the current conditions associated with snoring, a symptom increasingly expected to be the subject of dental treatment in the future, and the association between snoring and age and other factors targeted in the study.

Men were chosen as the study subjects, since more men snore habitually than women<sup>9,10</sup>.

As the study items, "wellbeing on waking up" was included to indicate the degree of sleep satisfaction and quality of sleep. In addition, the main symptoms ("snoring", "daytime drowsiness", "feelings of suffocation at night", "moving around at night" and "frequent awakening") and symptoms of SAS ("obesity" and "high blood pressure") were included.

"Nasal obstruction" and "tonsillar enlargement", which may cause constriction or obstruction of the airways, and "teeth-clenching", which is reported to be associated with sleep-related breathing disorders, were also included<sup>11,12</sup>.

Snoring was reported by 303 subjects (63%), more than half of the total. Of these, 222 subjects (46%) described snoring occasionally. However, since even those who usually do not snore may do so when they are tired or after drinking, those who reported occasional snoring were categorized in the normal non-snoring group.

Eighty-one subjects (17%) described snoring every night. This figure is slightly lower but similar to that reported by a study describing that 20~30% of the total population habitually snore<sup>13</sup>.

Regarding snoring, our findings indicated that middle-aged and elderly men snore more often than young men; probably because of the loosening of muscles associated with aging. It is assumed that decreased muscular activity, specifically of the upper airway muscles<sup>14</sup> may largely contribute to this increase in snoring. According to a report<sup>15</sup>, loosening of the upper airway muscles may also reduce the tension of the genioglossus muscle, which plays an important role in maintaining the upper airway cavity, causing the root of tongue to drop and constrict the airway, and eventually causing snoring<sup>15</sup>.

We found no difference in answers to the study items that was characteristic of each age group, probably because the number of subjects in each group was varied greatly.

In Group S, "frequent changes in sleeping position" and "teeth-clenching" were commonly noted in all age groups. "Frequent changes in sleeping position" may result from breathing problems during sleep followed by repeated movement in search of a comfortable posture that eases breathing<sup>16</sup>.

Although teeth-clenching occurs during every stage of sleep, it is often observed during shallow sleep and it is reported that clenching may induce sleep-related breathing disorders<sup>12</sup>. It is also reported that sleep apnea tends to appear as the sleep becomes shallow<sup>17</sup>, which suggests some association with the

mechanism of development of teeth-clenching and sleep-related breathing disorders.

## CONCLUSION

A questionnaire investigating the frequency of snoring and clinical condition of those who snore was completed by 478 men. The results indicated that:

1. Of 478 subjects, 81 (17%) stated that they snore every night.
2. Significantly more middle-aged and elderly men snore than young men.
3. Of 10 questionnaire items, "frequent changes in sleeping position" and "teeth-clenching" were commonly observed in all age groups.

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## いびきに関するアンケート調査

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横山佳郎 山村善治 石神元 倉知正和

最近, 習慣性いびき症や軽度ないし中等度の睡眠時無呼吸症候群と診断された患者に対する治療法として, 口腔内アプライアンスを装着する方法が注目されるようになってきており, その臨床的有用性も多々報告されている。

こうした情報は, 一般の人にも提供されてきていることから, 睡眠時のいびきや無呼吸を主訴として歯科医院に直接歯科的治療を希望されて来院されたり, 医療機関から歯科的治療を依頼, 紹介されたりすることも稀ではなくなっている。

そこで本研究では, 今後, 治療の機会が多くなることが予測されるいびきをかく者の実態についてアンケート調査を行った。

全被験者478名中, 毎晩いびきをかくと回答したのは81名(17%)であり, いびきをかく者は, 青年層に比較して中年層, 老年層で有意に多かった。

10の調査項目うち”寝相”と”歯ぎしり”は, 各年代層で共通して該当した項目であった。

キーワード: アンケート調査, 習慣性いびき症