

# Sleep Disturbances and Personality Type Test

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**Purpose:** The purpose of this study was to assess the association between sleep disturbances and personality type.

**Methods:** Five hundred twenty-four college students in Gyeonggi-do completed the Myers-Briggs Type Indicator (MBTI) and a questionnaire and collected data were analyzed by SAS 9.4 program.

**Results:** Extroversion (E) type, sensation (S) type, and perceiving (P) type had significantly higher prevalence of insomnia than introversion (I) type ( $p<0.05$ ), intuition (N) type ( $p<0.05$ ), and judging (J) type ( $p<0.001$ ), respectively. Tooth grinding, snoring and insomnia appeared to occur more frequently in feeling (F) type than in thinking (T) type. Tooth clenching, tooth grinding and snoring seemed to occur more frequently in S type than in N type. Insomnia occurred significantly the most frequently in sensation-feeling (SF) type ( $p<0.05$ ). Tooth grinding and snoring seemed to occur the most frequently in SF type. A significantly increased percentage of sensation-perceiving (SP) type demonstrated insomnia ( $p<0.001$ ). Tooth clenching, tooth grinding and snoring seemed to occur the most frequently in sensation-judging (SJ) type. Sensitive or nervous type of personality had significantly higher prevalence of insomnia than relaxed or general type of personality ( $p<0.01$ ). A significantly increased percentage of subjects with bad general health status showed insomnia ( $p<0.0001$ ). Tooth clenching and snoring seemed to occur the most frequently in subjects with bad general health status. A significantly decreased percentage of normal weight subjects demonstrated tooth grinding ( $p<0.05$ ). Snoring occurred significantly the most frequently in overweight subjects ( $p<0.001$ ). Tooth clenching showed significant correlation with stress ( $p<0.01$ ) and personality ( $p<0.05$ ). Snoring showed significant correlation with stress ( $p<0.05$ ) and body weight ( $p<0.001$ ). Insomnia showed significant correlation with stress ( $p<0.0001$ ), personality ( $p<0.01$ ), and general health status ( $p<0.0001$ ).

**Conclusions:** Sleep disturbances including tooth clenching and insomnia were associated with personality type and it is desirable to manage them considering personality type.

**Key Words:** Myers-Briggs Type Indicator; Personality; Sleep disturbances; Stress

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## INTRODUCTION

Sleep disturbances associated with orofacial pain are tooth clenching, tooth grinding, snoring and insomnia. Tooth clenching is continuously maintaining a static condition of maximum intercuspation. Tooth grinding is a dynamic condition of maximum intercuspation that indicates a forceful movement of the mandible from side to side.

Bruxism including both tooth clenching and tooth grinding is known to be related to psychological factors like emotional stress.<sup>1)</sup> Snoring is a noise produced by vibration of the soft palate and adjacent structures and represents partial obstruction due to narrowing of the upper airway at that site.<sup>2)</sup> Snoring can be associated with obstructive sleep apnea which is influenced by obesity.<sup>3)</sup> Insomnia usually takes one or more of the following forms: delay of sleep onset,

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difficulty staying asleep, or awakening too early. It was reported that insomnia was strongly related to mental and physical health problems.<sup>4)</sup>

Factors contributing to sleep disturbances do not apply uniformly to each individual and rather affect the course of the symptom according to personality and human nature. An individual adapts or shows various symptoms according to individual's coping ability with social affairs, stress, tension, anxiety derived from interpersonal relationship.<sup>5)</sup>

The Myers-Briggs Type Indicator (MBTI) measures personality types based on Jung's theory and is designed to identify an individual's preference in four planes: extroversion (E) vs introversion (I), sensation (S) vs intuition (N), thinking (T) vs feeling (F), and judging (J) vs perceiving (P).<sup>6)</sup>

A study was reported on the personality traits of psychophysiological disorder patients in dentistry.<sup>7)</sup> There have been studies on relation of psychological factors to sleep disturbances.<sup>8-10)</sup> Kim<sup>11)</sup> found the relationship between personality type and mental health. Reports on socio-psychological stress and stress coping style by personality type have been also suggested.<sup>12-14)</sup> The aim of this study was to assess the association between sleep disturbances and personality type and to use the result for the management of them.

## MATERIALS AND METHODS

This study is approved by the Institutional Review Board of Shingu College (IRB-2015-012).

### 1. Subjects

Data were collected from 524 college students in Gyeonggi-do, including 119 men and 405 women. Mean age of the subjects was 20.8±2.9 years (Table 1).

### 2. Data Collection

Data were obtained in May and June of 2015. After

explaining MBTI, the examiner distributed the MBTI form M to students and retrieved completed replies at their classroom. Moreover, the students were asked to answer the prepared questionnaire (Appendix 1) containing items on self-evaluation of sleep disturbances related to stress, general health status, body weight and also returned the completed answers. Collected MBTI replies were analysed and scored according to routine MBTI analysis.<sup>15)</sup>

### 3. Statistical Analyses

All the statistical analyses were performed by SAS 9.4 program (SAS Institute Inc., Cary, NC, USA). The chi-square test was used to evaluate the relationship of self-reporting prevalence rate of sleep disturbances to personality types, general health status and body weight. Pearson's correlations were performed to evaluate the relation between sleep disturbances and stress, personality, general health status and body weight.

## RESULTS

Eighty-three of subjects (15.8%) in this study have clenched teeth, 113 subjects (21.6%) ground teeth and 230 subjects (43.9%) snored during sleep. Two hundred sixty-four of subjects (50.4%) have experienced insomnia. With respect to four preferences of personality, E type was demonstrated by 318 subjects (60.7%), I type by 206 subjects (39.3%), S type by 313 subjects (59.7%), N type by 211 subjects (40.3%), T type by 152 subjects (29.0%), F type by 372 subjects (71.0%), J type by 217 subjects (41.4%), and P type by 307 subjects (58.6%). E type, S type, and P type had significantly higher prevalence of insomnia than I type ( $p<0.05$ ), N type ( $p<0.05$ ), and J type ( $p<0.001$ ), respectively. Tooth grinding, snoring and insomnia appeared to occur more frequently in F type than in T type. Tooth clenching, tooth grinding and snoring seemed to occur more frequently in S type than in N type (Table 2).

Regarding four psychological functions (NF, intuition-feeling; NT, intuition-thinking; SF, sensation-feeling; ST, sensation-thinking), NF type was shown by 164 subjects (31.3%), NT type by 47 subjects (9.0%), SF type by 208 subjects (39.7%), and ST type by 105 subjects (20.0%). Insomnia occurred significantly the most frequently in SF

**Table 1.** Demographics of the subjects

Sex	Subject	Age (y)
Men	119 (22.7)	21.5±4.0
Women	405 (77.3)	20.6±2.5
Total	524 (100.0)	20.8±2.9

Values are presented as number (%) or mean±standard deviation.

**Table 2.** Prevalence of sleep disturbances according to 4 pairs of preference tendency (n=524)

Sleep disturbance	n (%)	E vs I		S vs N		T vs F		J vs P	
		E	I	S	N	T	F	J	P
		318 (60.7)	206 (39.3)	313 (59.7)	211 (40.3)	152 (29.0)	372 (71.0)	217 (41.4)	307 (58.6)
Tooth clenching	83 (15.8)	52 (16.4)	31 (15.1)	54 (17.3)	29 (13.7)	26 (17.1)	57 (15.3)	34 (15.7)	49 (16.0)
p-value		0.6897		0.2807		0.612		0.928	
Tooth grinding	113 (21.6)	68 (21.4)	45 (21.8)	72 (23.0)	41 (19.4)	29 (19.1)	84 (22.6)	50 (23.0)	63 (20.5)
p-value		0.9003		0.3295		0.3764		0.4896	
Snoring	230 (43.9)	144 (45.3)	86 (41.8)	143 (45.7)	87 (41.2)	62 (40.8)	168 (45.2)	93 (42.9)	137 (44.6)
p-value		0.4257		0.3136		0.3601		0.6879	
Insomnia	264 (50.4)	172 (54.1)	92 (44.7)	169 (54.0)	95 (45.0)	72 (47.4)	192 (51.6)	88 (40.6)	176 (57.3)
p-value		0.035*		0.044*		0.3779		0.0002***	

E, extroversion; I, introversion; S, sensation; N, intuition; T, thinking; F, feeling; J, judging; P, perceiving.

Values are presented as number (%).

p-values were completed by chi-square test.

\*p<0.05. \*\*\*p<0.001.

**Table 3.** Prevalence of sleep disturbances according to four psychological functions (n=524)

Sleep disturbance	Function				p-value
	NF	NT	SF	ST	
	164 (31.3)	47 (9.0)	208 (39.7)	105 (20.0)	
Tooth clenching	22 (13.4)	7 (14.9)	35 (16.8)	19 (18.1)	0.7273
Tooth grinding	36 (22.0)	5 (10.6)	48 (23.1)	24 (22.9)	0.2937
Snoring	67 (40.9)	20 (42.6)	101 (48.6)	42 (40.0)	0.3715
Insomnia	71 (43.3)	24 (51.1)	121 (58.2)	48 (45.7)	0.0259*

NF, intuition-feeling; NT, intuition-thinking; SF, sensation-feeling; ST, sensation-thinking.

Values are presented as number (%).

p-values were completed by chi-square test.

\*p<0.05.

**Table 4.** Prevalence of sleep disturbances according to four temperaments (n=524)

Sleep disturbance	Temperament				p-value
	NF	NT	SJ	SP	
	164 (31.3)	47 (9.0)	155 (29.6)	158 (30.1)	
Tooth clenching	22 (13.4)	7 (14.9)	27 (17.4)	27 (17.1)	0.7458
Tooth grinding	36 (22.0)	5 (10.6)	39 (25.2)	33 (20.9)	0.207
Snoring	67 (40.9)	20 (42.6)	72 (46.5)	71 (44.9)	0.7695
Insomnia	71 (43.3)	24 (51.1)	66 (42.6)	103 (65.2)	0.0001***

NF, intuition-feeling; NT, intuition-thinking; SJ, sensation-judging; SP, sensation-perceiving.

Values are presented as number (%).

p-values were completed by chi-square test.

\*\*\*p<0.001.

type (p<0.05). Tooth grinding and snoring seemed to occur the most frequently in SF type (Table 3).

Concerning four temperaments (NF, NT, sensation-judging [SJ], sensation-perceiving [SP]), NF type was exhibited by 51 subjects (10.6%), NT type by 52 subjects (10.8%), SJ type by 237 subjects (49.2%), and SP type by 142 subjects (29.4%). Compared to SJ, NT, NF type, a significantly

increased percentage of SP type demonstrated insomnia (p<0.001). Tooth clenching, tooth grinding and snoring seemed to occur the most frequently in SJ type (Table 4).

Among four subjective types of personality (relaxed, general, sensitive, and nervous) sensitive or nervous type had significantly higher prevalence of insomnia than relaxed or general type (p<0.01). Tooth clenching and tooth grinding

appeared to occur more frequently in sensitive or nervous type than in relaxed or general type (Table 5).

Compared to subjects with good or fair general health status, a significantly increased percentage of subjects with bad general health status showed insomnia ( $p<0.0001$ ). Tooth clenching and snoring seemed to occur the most frequently in subjects with bad general health status (Table 6).

Compared to overweight or underweight subjects, a significantly decreased percentage of normal weight subjects demonstrated tooth grinding ( $p<0.05$ ). Snoring occurred significantly the most frequently in overweight subjects ( $p<0.001$ ) (Table 7).

Pearson's correlation coefficients for sleep disturbances are given in Table 8. Tooth clenching showed significant correlation with stress ( $p<0.01$ ) and personality ( $p<0.05$ ). Snoring showed significant correlation with stress ( $p<0.05$ ) and body weight ( $p<0.001$ ). Insomnia showed significant correlation with stress ( $p<0.0001$ ), personality ( $p<0.01$ ), and general health status ( $p<0.0001$ ).

## DISCUSSION

Sleep relieves the mental fatigue of daytime and recovers an individual's physical state. As one's life style becomes

**Table 5.** Prevalence of sleep disturbances according to four subjective types of personality (n=524)

Sleep disturbance	Subjective type				p-value
	Relaxed 117 (22.3)	General 251 (47.9)	Sensitive 137 (26.1)	Nervous 19 (3.6)	
Tooth clenching	15 (12.8)	35 (13.9)	28 (20.4)	5 (26.3)	0.1568
Tooth grinding	24 (20.5)	50 (19.9)	31 (22.6)	8 (42.1)	0.1505
Snoring	52 (44.4)	109 (43.4)	60 (43.8)	9 (47.4)	0.988
Insomnia	54 (46.2)	112 (44.6)	85 (62.0)	13 (68.4)	0.0028**

Values are presented as number (%).

p-values were completed by chi-square test.

\*\* $p<0.01$ .

**Table 6.** Prevalence of sleep disturbances according to general health status (n=524)

Sleep disturbance	General health status			p-value
	Good 248 (47.3)	Fair 260 (49.6)	Bad 16 (3.1)	
Tooth clenching	32 (12.9)	47 (18.1)	4 (25.0)	0.1663
Tooth grinding	50 (20.2)	61 (23.5)	2 (12.5)	0.4451
Snoring	109 (44.0)	111 (42.7)	10 (62.5)	0.3009
Insomnia	99 (39.9)	150 (57.7)	15 (93.8)	<0.0001****

Values are presented as number (%).

p-values were completed by chi-square test.

\*\*\*\* $p<0.0001$ .

**Table 7.** Prevalence of sleep disturbances according to body weight (n=524)

Sleep disturbance	Body weight			p-value
	Overweight 136 (26.0)	Normal 336 (64.1)	Underweight 52 (9.9)	
Tooth clenching	21 (15.4)	55 (16.4)	7 (13.5)	0.8575
Tooth grinding	33 (24.3)	62 (18.5)	18 (34.6)	0.0208*
Snoring	79 (58.1)	131 (39.0)	20 (38.5)	0.0005***
Insomnia	76 (55.9)	166 (49.4)	22 (42.3)	0.209

Values are presented as number (%).

p-values were completed by chi-square test.

\* $p<0.05$ . \*\*\* $p<0.001$ .

**Table 8.** Correlation between sleep disturbances and stress, personality, general health status, and body weight

Sleep disturbance	Stress	Personality	Health status	Body weight
Tooth clenching	0.12836	-0.09188	-0.08242	0.00629
p-value	0.0032**	0.0355*	0.0594	0.8858
Tooth grinding	0.05362	-0.06196	-0.01698	-0.02504
p-value	0.2205	0.1567	0.6981	0.5674
Snoring	0.10839	-0.00265	-0.01963	0.14746
p-value	0.013*	0.9517	0.6539	0.0007***
Insomnia	0.30015	-0.13493	-0.22625	0.07724
p-value	<0.0001****	0.002**	<0.0001****	0.0773

p-values were completed by Pearson's correlation analysis.

\*p<0.05. \*\*p<0.01. \*\*\*p<0.001. \*\*\*\*p<0.0001.

more complicated with mental stress, sleep disturbances are increasing.<sup>5)</sup> 15.8% of subjects in this study clenched teeth during sleep and 21.6% ground teeth during sleep, though Chung and Lim<sup>16)</sup> reported that prevalence rate of tooth clenching and tooth grinding of university students in Seoul was 22.3%, 12.5%, respectively (Table 2). The prevalence rate of snoring in this study was 43.9% which was higher than that noted in previous investigation in which 25.7% of young adults in Hong Kong reported snoring (Table 2).<sup>17)</sup> 50.4% of subjects in this study experienced insomnia while about one third of the adult population reported insomnia symptoms (Table 2).<sup>18)</sup>

The MBTI identifies four preferences: E vs I, S vs N, T vs F, and J vs P. 'E' indicates direction of interest toward the outer world of people and things. 'I' indicates direction of energy toward the inner world of ideas. 'S' means a person's manner of obtaining information through direct experience by the five senses. 'N' means a person's manner of obtaining information through inferred meaning or insight. 'T' identifies the way in which a person decides on the basis of impersonal logic and analysis. 'F' identifies the way in which a person decides according to personal values and what is subjectively important. 'J' indicates a person's life style attitude which is planned and orderly. 'P' indicates a person's life style attitude which is flexible and spontaneous.<sup>6)</sup>

There have been the evidence that emotional stress or depression precedes the onset of insomnia and the study that insomnia is associated with marked distress.<sup>10,19)</sup> S type and P type in special education teachers reported higher job stress than N type and J type, respectively.<sup>20)</sup> These findings

explain the result that S type and P type had significantly higher prevalence of insomnia than N type (p<0.05) and J type (p<0.001), respectively (Table 2). My result that E type had significantly higher prevalence of insomnia than I type (p<0.05) is contrary to the report that I type had more stress than E type in kindergarten teachers (Table 2).<sup>12)</sup>

Emotional stress leads to muscle tension and influences bruxism activity.<sup>8)</sup> The severity of bruxism increases with the level of stress perceived by the individual.<sup>1)</sup> Previous studies documented impaired neuropsychologic functioning in children with a history of snoring.<sup>21,22)</sup> S type and F type reported higher stress on work and life problems than N type and T type, respectively.<sup>23)</sup> These investigations are consistent with my result that tooth clenching and tooth grinding seemed to occur more frequently in S type than in N type and that snoring appeared to occur more frequently in S type and F type than in N type and T type, respectively (Table 2).

Among four psychological functions (ST, SF, NT, NF), SF type tends to be sympathetic and vulnerable to stress.<sup>23)</sup> Thorne et al.<sup>24)</sup> reported that SF type was more frequent than other types among patients with coronary heart disease which is psychophysiological disorder. These findings support the result that insomnia occurred significantly the most frequently in SF type (p<0.05) and that tooth grinding and snoring seemed to occur the most frequently in SF type (Table 3).

Concerning four temperaments (SP, SJ, NT, NF), SP type is likely to be impulsive and to dislike constraint.<sup>25)</sup> SP type of middle school soccer players showed more competitive state anxiety than other types.<sup>26)</sup> These reports are comparable

to the result that compared to other types, a significantly increased percentage of SP type demonstrated insomnia ( $p < 0.001$ ) (Table 4). The study that SJ type of student pilots reported higher stress on flight is similar to the result that tooth clenching, tooth grinding and snoring seemed to occur the most frequently in SJ type (Table 4).<sup>27)</sup>

Cho and Kim<sup>28)</sup> demonstrated the relationship between the sensitive type of personality and temporomandibular disorders which are stress-related disorders. Minneman et al.<sup>29)</sup> suggested that the personality trait of neuroticism was associated with the stress variables. These studies explain the result that sensitive or nervous type of personality had significantly higher prevalence of insomnia than relaxed or general type of personality ( $p < 0.01$ ) and that tooth clenching and tooth grinding appeared to occur more frequently in sensitive or nervous type than in relaxed or general type (Table 5).

Psychological stress may induce immunosuppression and alter the susceptibility to infectious agents.<sup>30)</sup> Stress-induced alterations in endocrine function could lead to depleting one's ability to resist stress, which ultimately results in the disease process.<sup>31)</sup> Liu and Liu<sup>32)</sup> reported that poor perceived health was associated with increased risk for insomnia symptoms. These findings support the result that a significantly increased percentage of subjects with bad general health status showed insomnia ( $p < 0.0001$ ) and that tooth clenching and snoring seemed to occur the most frequently in subjects with bad general health status (Table 6).

When stress repeatedly activates the hypothalamic-pituitary-adrenal axis, excessive secretion of cortisol causes accumulation of visceral fat and increased food intake, which leads to weight gain.<sup>33)</sup> Snoring was associated with a high body mass index.<sup>34)</sup> These findings are consistent with my result that a significantly decreased percentage of normal weight subjects demonstrated tooth grinding ( $p < 0.05$ ) and that snoring occurred significantly the most frequently in overweight subjects ( $p < 0.001$ ) (Table 7).

In conclusion, the purpose of this study was to assess the association between sleep disturbances and personality type. Five hundred twenty-four college students in Gyeonggi-do completed the MBTI and a questionnaire and collected data were analyzed by SAS 9.4 program. The obtained results were as follows:

1. E type, S type, and P type had significantly higher prevalence of insomnia than I type ( $p < 0.05$ ), N type ( $p < 0.05$ ), and J type ( $p < 0.001$ ), respectively. Tooth grinding, snoring and insomnia appeared to occur more frequently in F type than in T type. Tooth clenching, tooth grinding and snoring seemed to occur more frequently in S type than in N type.

2. Insomnia occurred significantly the most frequently in SF type ( $p < 0.05$ ). Tooth grinding and snoring seemed to occur the most frequently in SF type.

3. Compared to SJ, NT, NF type, a significantly increased percentage of SP type demonstrated insomnia ( $p < 0.001$ ). Tooth clenching, tooth grinding and snoring seemed to occur the most frequently in SJ type.

4. Sensitive or nervous type of personality had significantly higher prevalence of insomnia than relaxed or general type of personality ( $p < 0.01$ ). Tooth clenching and tooth grinding appeared to occur more frequently in sensitive or nervous type than in relaxed or general type.

5. Compared to subjects with good or fair general health status, a significantly increased percentage of subjects with bad general health status showed insomnia ( $p < 0.0001$ ). Tooth clenching and snoring seemed to occur the most frequently in subjects with bad general health status.

6. Compared to overweight or underweight subjects, a significantly decreased percentage of normal weight subjects demonstrated tooth grinding ( $p < 0.05$ ). Snoring occurred significantly the most frequently in overweight subjects ( $p < 0.001$ ).

7. Tooth clenching showed significant correlation with stress ( $p < 0.01$ ) and personality ( $p < 0.05$ ). Snoring showed significant correlation with stress ( $p < 0.05$ ) and body weight ( $p < 0.001$ ). Insomnia showed significant correlation with stress ( $p < 0.0001$ ), personality ( $p < 0.01$ ) and general health status ( $p < 0.0001$ ).

Conclusively, sleep disturbances including tooth clenching and insomnia were associated with personality type and it is desirable to manage them considering personality type.

## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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**Appendix 1.** Form and contents of questionnaire**Questionnaire**

Name of College:                      Name of Department:                      Grade:  
Name:                      Birthday:                      Age:                      Gender:

Please answer the following questions by checking the one answer which describes you.

1. Have you ever clenched your teeth during sleep or awaked with your teeth clenched?  
1) Yes                                      2) No
  
2. Have you ever ground your teeth during sleep or heard that you were a bruxer?  
1) Yes                                      2) No
  
3. Have you ever snored during sleep or heard that you were a snorer?  
1) Yes                                      2) No
  
4. Have you difficulty initiating or maintaining sleep at night or nonrestorative sleep?  
1) Yes                                      2) No
  
5. Are you under stressful condition due to academic or other difficulties?  
1) Yes                                      2) No
  
6. How would you evaluate your personality?  
1) Relaxed      2) General      3) Sensitive      4) Nervous
  
7. How would you evaluate your general health status?  
1) Good                      2) Fair                      3) Bad
  
8. How would you evaluate your body weight?  
1) Overweight                      2) Normal                      3) Underweight

Thank you for your cooperation.