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Comparison of Subjective Dizziness, Tinnitus, Headache, Taste, and Smell Results by Age Group in Yakumo Town Residents Health Checkup Conducted in 2019 with Measured Taste and Smell Test Results

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We will report on the results of the otolaryngology questionnaire survey conducted in 2019.

The target population is 128 males and 169 females who are residents of Yakumo Town over 40 years old, for a total of 297 people.

Self-administered questionnaire survey (feeling conscious: vertigo, tinnitus, headache, hearing, taste, smell), taste test (Salt taste: Salseve; manufactured by Advantech), and smell test (12 kinds of odors: Smell sticks; Daiichi Factory C0., Ltd).

Keywords: yakumo study, olfactory function test, taste test, the prevalence of vertigo, the prevalence of tinnitus.

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Relationships among Auditory, Olfactory and Taste Function: Association with Vertigo

Naomi katayama

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Self-administered questionnaire survey (feeling conscious: vertigo, tinnitus, headache, hearing, taste, smell), taste test (Salt taste: Salseve; manufactured by Advantech), and smell test (12 kinds of odors: Smell sticks; Daiichi Factory C0., Ltd).

The obtained data were analyzed using Binomial logistic regression analysis (Excel statistics: SSRI Co., Ltd.) for statistical comparison.

As a result, more than 70% of the participants in their 40s, 60s, 70s, and 80s answered that they had no subjective vertigo.

In the case of females in their 50s, more than 10% more people than males felt subjective dizziness. (About 40% of females in their 50s felt vertigo.)

Furthermore, conscious vertigo was also associated with obesity, urinalysis, fundus, lipid, and inflammation. These items were statistically significantly related. In particular, it was highly correlated with inflammation.

Participants with dizziness were more likely to have tinnitus and headaches. There was statistical significance.

In addition, it was found that those who are consciously vertigois related to the measured olfactory test results but not related to the taste test results.

In the future, it will be necessary to investigate the conscious vertigo and degree of awareness of odors.

Keywords: yakumo study, olfactory function test, taste test, the prevalence of vertigo, the prevalence of tinnitus.

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I. Introduction

Based on the Health Promotion Law, health Japan 21 was issued as Ministry of Health, Labor and Welfare No.430 in 2012.Public health centers of local governments are conducting Health Japan 21 according to local conditions in accordance with the policy set out by the Japanese government. Currently, Health Japan 21 2nd plan is being carried out.

The Healthy Japan 21 2nd plan includes nine different types of content (nutrition and diet, physical activity and exercise, rest and mental health, tobacco, health care, dental health, diabetes, cardiovascular disease, and cancer), In addition, each basic plan and goals are shown in it.

Currently, health management aimed at improving productivity has begun to be implemented with the goal to maintain the health of workers in Japan. This is because it is essential to raise the health condition of each employee and improve productivity due to the social background of a declining working population, an aging workforce, and an increase in national medical expenses in Japan. A feeling of dizziness, a headache, or a minor discomfort can significantly affect productivity. Therefore, in this study, we report the results of a self-administered questionnaire survey conducted in 2019 on subjective dizziness, tinnitus, and headache at resident health checkups in Yakumo Town, Hokkaido, Japan, where there is little population movement. From 2027 to 2019, we have continuously conducted taste and smell test results at the time of the Yakumo town resident health checkups. Using these results, we will report a comparison by age group. Although many sensory organs have been reported to deteriorate with age, there have been few reports on the interrelationships among taste, smell, hearing and vision.

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In recent years, many reports have revealed that reduced sense of smell and decreased sense of taste occur as precursors of cognitive decline.

In recent years, there have been many reports that cognitive function declines when hearing declines. Therefore, this study also reports on the relationship between taste and smell test results and other test results in residents aged 40 and over in Yakumo Town, Hokkaido, Japan resident health checkups.

II. Material and Method

A total of 297 participants, 128 male and 169 female aged 40 and over, participated in the health checkup for residents of Yakumo Town, Hokkaido, Japan, in August 2019. The subjects of the self-reported questionnaire survey were subjective dizziness, subjective tinnitus, subjective headache, subjective taste, and subjective sense of smell.

A simple salty taste test kit (salsave: manufactured by Advantech) was used for the taste test. A simple olfactory test kit (smell stick: manufactured by Daiichi Kogyo Co., Ltd.) was used for the olfactory test.

The obtained data were compared using statistical methods. A binomial logistic regression analysis was used. The objective variable was subjective dizziness, and the explanatory variables were subjective tinnitus, headache, taste, smell, taste test results, and smell test results. The statistical software used was Excel Statistics 2020 (SSRI Co.,).

A quick saltiness test recorded perceptible concentrations within six concentrations (0.6%, 0.8%, 1.0%, 1.2%, 1.4%, 1.6%). The salty taste was categorized into three categories: 0.6% to 1.0% salty taste is the normal range, 1.2% to 1.6% requires observation, and 1.6% or more requires consultation.

A simple olfactory test using12 different odors (Japanese ink, wood, perfume, menthol, mandarin orange, curry, household gas, rose, cypress, stuffy socks, condensed milk, and fried garlic) and recorded the number of smells. Of the 12 types of odors, if six or more classes were recognized, they were classified as normal range; if 5 to 3 classes observation was required; and if two classes or less, consultation was required.

III. Results

As shown in Table 1, the participants were 33 in their 40s, 63 in their 50s, 116 in their 60s, 76 in their 70s, and eight in their 80s.

Table 1 Age distribution of participants (n=297)

	40s	50s	60s	70s	80s
Male (n=128)	10	24	49	39	6
Female (n=169)	23	39	67	37	3
Total (n=297)	33	63	116	76	9

Table 2 shows subjective dizziness by age group. Among participants in their 50s, 50s, and 60s, more male participants than female participants answered that they did not feel subjective dizziness. In addition, it was found that many females in their 50shas a personal feeling of dizziness.

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Table 2 Subjective dizziness in each age group numbetr（%）

Male	Male (n=128)			
	None	Somtmes	Common	No answer
40s (n=10)	9 (90.0%)	1 (10.0%)	0 (0.0%)	0 (0.0%)
50s (n=24)	19 (79.2%)	4 (16.7%)	1 (4.2%)	0 (0.0 %)
60s (n=49)	40 (81.6 %)	8 (16.3%)	0 (0.0%)	1 (2.0%)
70s (n=39)	31 (79.5%)	7 (17.9%)	1 (2.6%)	0 (0.0%)
80s (n=6)	4 (66.7%)	2 (33.3%)	0 (0.0 %)	0 (0.0%)
Total 128	103 (80.5%)	22 (17.2%)	2 (1.6%)	1 (0.8%)
Female	Female (n=169)			
	None	Somtmes	Common	No answer
40s (n=23)	16 (69.6%)	5 (21.7%)	1 (4.3%)	1 (4.3%)
50s (n=39)	24 (61.5%)	14 (35.9%)	1 (2.6%)	0 (0.0%)
60s (n=67)	50 (74.6 %)	13 (19.4%)	3 (4.5%)	1 (1.5%)
70s (n=37)	33 (89.2%)	4 (10.8%)	0 (0.0%)	0 (0.0%)
80s (n=3)	3 (100.0%)	0 (0.0 %)	0 (0.0%)	0 (0.0 %)
Total 169	126 (74.6%)	36 (21.3%)	5 (3.0%)	2 (1.2%)

Table 3 shows subjective tinnitus for each age group. The proportion of males and females in their 40s, 50s, and 60s who did not experience subjective tinnitus was about the same (60-66%).

Table3 Subjective tinnitus in each age group numbetr（%）

Male	Male (n=128)			
	None	Occasionally	Always	No answer
40s (n=10)	6 (60.0%)	3 (30.0%)	1 (10.0%)	0 (0.0%)
50s (n=24)	16 (66.7%)	7 (29.2%)	1 (4.2 %)	0 (0.0%)
60s (n=49)	30 (61.2%)	14 (28.6%)	5 (10.2%)	0(0.0%)
70s (n=39)	25 (64.1 %)	8 (20.5%)	6 (15.4%)	0 (0.0%)
80s (n=6)	4 (66.7%)	1 (16.7%)	1 (16.7%)	0 (0.0%)
Total 128	81 (63.3%)	33 (25.8%)	14 (10.9%)	0 (0.0%)
Female	Female (n=169)			
	None	Occasionally	Always	No answer
40s (n=23)	14 (60.9 %)	9 (39.1%)	0 (0.0%)	0 (0.0%)
50s (n=39)	25 (64.1%)	14 (35.9%)	0 (0.0%)	0 (0.0%)
60s (n=67)	44 (65.7%)	17 (25.4%)	6 (9.0%)	0(0.0%)
70s (n=37)	27 (73.0%)	7 (18.9%)	3 (8.1%)	0 (0.0%)
80s (n=3)	1 (33.3 %)	1 (33.3%)	1 (33.3 %)	0 (0.0%)
Total 169	111 (65.7%)	48 (28.4%)	10 (5.9%)	0 (0.0%)

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Table 4 shows the results of the dizziness questionnaire. It is found that female participants were feeling headaches more than males in each age group.

Table 4 Subjective headache in each age group numbetr (%)

Male	Male (n=128)			
	None	Occasionally	Sometimes	Always
40s (n=10)	10 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
50s (n=24)	24 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
60s (n=49)	49 (100.0 %)	0 (0.0%)	0 (0.0%)	0 (0.0%)
70s (n=39)	38 (97.4%)	1 (2.6%)	0 (0.0%)	0 (0.0%)
80s (n=6)	6 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Total 128	127 (99.2%)	1 (0.8%)	0 (0.0%)	0 (0.0%)
Female	Female (n=169)			
	None	Occasionally	Sometimes	Always
40s (n=23)	14 (60.9%)	9 (39.1 %)	0 (0.0%)	0 (0.0%)
50s (n=39)	34 (87.2%)	5 (12.8%)	0 (0.0%)	0 (0.0%)
60s (n=67)	60 (89.6%)	7 (10.4%)	0 (0.0%)	0 (0.0%)
70s (n=37)	35 (94.6%)	2 (5.4 %)	0 (0.0%)	0 (0.0%)
80s (n=3)	3 (100.0%)	0(0.0 %)	0 (0.0%)	0 (0.0%)
Total 169	146 (86.4%)	23 (13.6%)	0 (0.0%)	0 (0.0%)

Table 5 shows a subjective sense of smell. Both males and females showed a marked decline in olfaction with age. In particular, males in their 60s and 70s felt that their subjective sense of smell was inferior to that of females.

Table 5 Subjective sense of smell in each age group numbetr (%)

Male	Male (n=128)			
	None	Hard to understand	Somwhat confusing	understand
40s (n=10)	0 (0.0 %)	0 (0.0 %)	1 (10.0%)	9 (90.0%)
50s (n=24)	0(0.0 %)	0 (0.0 %)	5 (10.8 %)	19 (79.2%)
60s (n=49)	4 (8.2 %)	2 (4.1%)	10 (20.4 %)	33 (67.3%)
70s (n=39)	2 (5.1%)	2 (5.1%)	12 (30.8 %)	23 (59.0%)
80s (n=6)	0 (0.0%)	1 (16.7 %)	2 (33.3%)	3 (50.0%)
Total 128	6 (4.7%)	5 (3.9%)	30 (23.4%)	87 (68.0%)
Female	Female (n=169)			
	None	Hard to understand	Somwhat confusing	understand
40s (n=23)	0 (0.0 %)	1 (4.3 %)	3 (13.0%)	19 (82.6 %)
50s (n=39)	0 (0.0 %)	1 (2.6 %)	5 (12.8 %)	33 (84.6%)
60s (n=67)	2 (3.0%)	1 (1.5 %)	12 (19.9%)	52 (77.6%)
70s (n=37)	1 (2.7 %)	0 (0.0%)	7 (18.9 %)	29 (78.4%)
80s (n=3)	0 (0.0%)	0 (0.0%)	2 (66,7 %)	1 (33.3%)
Total 169	3 (1.8%)	3 (1.8%)	29 (17.2%)	134 (79.3%)

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Table 6 shows the subjective sense of taste for each age group. Compared to males, females answered that they could appreciate the taste of each age group. However, the effect of aging was small in both males and females.

Table 6 Subjective sense of taste in each age group numbetr（%）

Male	Male (n=128)			
	None	Hard to understand	Somwhat confusing	understand
40s（n=10)	0 (0.0%)	0 (0.0%)	1 (10.0%)	9 (90.0%)
50s（n=24)	0 (0.0%)	0 (0.0%)	5 (10.8%)	19 (79.2%)
60s（n=49)	1 (2.0 %)	3 (6.1%)	3 (6.1%)	41 (83.7%)
70s（n=39)	0 (0.0%)	1 (2.5 %)	9 (23.1%)	29 (74.4%)
80s（n=6)	0 (0.0 %)	0 (0.0 %)	3 (%50.0)	3 (50.0%)
Total 128	1 (0.8%)	4 (3.1%)	21 (16.4%)	101 (78.9%)
Female	Female (n=169)			
	None	Hard to understand	Somwhat confusing	understand
40s（n=23)	0 (0.0%)	0 (0.0%)	0 (0.0%)	22 (100.0%)
50s（n=39)	0 (0.0%)	0 (0.0%)	0 (0.0%)	39 (100.0%)
60s (n=67)	2 (3.0%)	0 (0.0%)	5 (7.5 %)	60 (89.6%)
70s（n=37)	0 (0.0%)	0 (0.0%)	4 (10.8%)	33 (89.2%)
80s（n=3)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	3 (100.0%)
Total 169	2 (1.2%)	0 (0.0%)	9 (5.3%)	157 (92.9%)

Table 7 shows the results of the 12 odor tests on the odor sticks. It has been found that the sense of smell declines with aging. It was found that there was more males in their 50s to 80s who had less recognition of odor than females.

Table 7 Olfactory test results in each age group numbetr（%）

Male	Male (n=128)			
	Normal range	Observation required	Consultation required	No answer
40s（n=10)	10 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
50s（n=24)	20 (83.3 %)	3 (12.5 %)	0 (0.0 %)	0 (0.0 %)
60s（n=49)	32 (65.3%)	13 (26.5%)	4 (8.2 %)	0 (0.0 %)
70s（n=39)	21 (53.8%)	11 (28.2 %)	7 (17.9%)	0 (0.0 %)
80s（n=6)	3 (50.0%)	2 (33.3%)	1 (16.6%)	0 (0.0%)
Total 128	86 (67.2%)	29 (22.6%)	12 (0.9%)	0 (0.0%)
Female	Female (n=169)			
	Normal range	Observation required	Consultation required	No answer
40s（n=23)	22 (95.6 %)	1 (4.3%)	0 (0.0%)	0 (0.0%)
50s（n=39)	37 (94.9%)	2 (5.1%)	0 (0.0 %)	0 (0.0 %)
60s (n=67)	62 (92.5%)	4 (10.3%)	1 (1.5%)	0 (0.0 %)
70s（n=37)	28 (75.7%)	28 (75.7%)	1 (2.7%)	0 (0.0 %)
80s（n=3)	2 (66.7%)	1 (33.3 %)	0 (0.0%)	0 (0.0%)
Total 169	151 (89.3%)	36 (21.3%)	2 (1.2%)	0 (0.0%)

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Table 8 shows the salty taste test results by Salsave. There was no difference in the results of the salty taste test between males and females. However, there were more males than females who required consultation.

Table 8 Taste test results in each age group numbetr (%)

Male	Male (n=128)			
	Normal range	Observation required	Consultation required	No answer
40s (n=10)	9 (90.0 %)	1 (10.0 %)	0 (0.0%)	0 (0.0%)
50s (n=24)	18 (75.0 %)	3 (12.5 %)	3 (12.5%)	0 (0.0 %)
60s (n=49)	487.89 (%)	1 (2.4%)	5 (10.2%)	0 (0.0 %)
70s (n=39)	30 (76.9 %)	2 (5.1%)	7 (17.9%)	0 (0.0 %)
80s (n=6)	6 (100.0%)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
Total 128	106 (82.8%)	7 (5.5%)	15 (11.7%)	0 (0.0%)
Female	Female (n=169)			
	Normal range	Observation required	Consultation required	No answer
40s (n=23)	19 (82.6 %)	3 (13.0%)	1 (4.3 %)	0 (0.0%)
50s (n=39)	32 (82.1 %)	5 (12.8%)	2 (5.1%)	0 (0.0 %)
60s (n=67)	56 (83.6%)	8 (11.9%)	3 (4.5%)	0 (0.0 %)
70s (n=37)	31 (83.8%)	3 (8.1%)	3 (8.1%)	0 (0.0 %)
80s (n=3)	2 (66.7%)	0 (0.0 %)	1 (33.1 %)	0 (0.0 %)
Total 169	140 (82.8%)	19 (11.2%)	10 (5.9%)	0 (0.0%)

Table 9 shows the olfactory test results. The number of recognizable odors among 12 types of odors was recorded. It was shown that the number of perceived odors decreased as the age of the participants increased.

Table 9 Actual measurment results of the number of cognitions of twelve types of olfactory tests

Male	Male (n=128)												
	0	1	2	3	4	5	6	7	8	9	10	11	12
40s (n=10)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	1 (10.0 %)	2 (20.0 %)	1 (10.0 %)	2 (20.0 %)	1 (10.0 %)	2 (20.0 %)	1 (10.0 %)
50s (n=24)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	1 (4.2 %)	1 (4.2 %)	2 (8.3 %)	2 (8.3 %)	0 (0.0 %)	4 (16.7 %)	7 (29.2 %)	6 (25.0 %)	1 (4.2 %)	0 (0.0 %)
60s (n=49)	4 (8.2 %)	0 (0.0 %)	0 (0.0 %)	2 (4.1 %)	4 (8.2 %)	7 (14.3%)	4 (8.2 %)	9 (18.4%)	7 (4.2 %)	2 (4.2 %)	6 (12.2 %)	3 (6.2 %)	1 (2.0 %)
70s (n=39)	3 (7.7 %)	1 (5.1%)	1 (2.6 %)	3 (7.7 %)	4 (10.3 %)	5 (12.8 %)	4 (10.3 %)	0 (0.0 %)	5 (12.8 %)	5 (12.8 %)	2 (5.1 %)	3 (7.7 %)	2 (5.1 %)
80s (n=6)	0 (0.0 %)	1 (16.7 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	2 (33.3 %)	1 (16.7 %)	0 (0.0 %)	1 (16.7 %)	1 (16.7 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
Total 128	7 (5.5%)	3 (2.3%)	1 (0.8%)	6 (4.7%)	9 (7.0%)	16 (12.5%)	12 (9.4%)	11 (8.6%)	18 (14.1%)	17 (13.3%)	15 (11.7%)	9 (7.0%)	4 (3.1%)
Female	Female (n=169)												
	0	1	2	3	4	5	6	7	8	9	10	11	12
40s (n=23)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	1 (4.3 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	7 (30.4 %)	4 (17.4 %)	5 (21.7 %)	(17.4%) %	2 (8.7 %)
50s (n=39)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	2 (5.1 %)	1 (2.6 %)	1 (2.6 %)	6 (15.4 %)	7 (17.9 %)	7 (17.9 %)	11 (47.8 %)	4 (17.4 %)
60s (n=67)	0 (0.0 %)	0 (0.0 %)	1 (1.5 %)	0 (0.0 %)	4 6.0%)	0 (0.0 %)	6 (9.0 %)	5 (7.5 %)	10 (14.8 %)	8 (11.9 %)	9 (13.4 %)	18 (26.9 %)	6 (9.0 %)
70s (n=37)	0 (0.0 %)	0 (0.0 %)	1 (2.7 %)	1 (2.7 %)	1 (2.7%)	6 (16.2 %)	4 (10.8 %)	2 (5.4%)	8 (21.6 %)	7 (18.9 %)	6 (16.2 %)	1 (2.7 %)	0 (0.0 %)
80s (n=3)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	1 (33.3 %)	0 (0.0 %)	0 (0.0 %)	1 (33.3 %)	1 (33.3 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
Total 169	0 (0.0 %)	0 (0.0 %)	2 (1.2%)	2 (1.2%)	6 (3.6%)	8 (4.7%)	11 (6.5%)	9 (5.3%)	32 (18.9%)	26 (15.4%)	27 (16.0%)	34 (20.1%)	12 (7.1%)

Table 10 shows the salty taste test results. There was no age-related difference in saltiness perceived by the participants in both males and females.

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Table 10 Cognitive resultsof salt concentretion in a salty taste test（number：%）

Male	Male (n=128)						
	0.60%	0.80%	1.00%	1.20%	1.40%	1.60%	1.60% more
40s (n=10)	3 (30.0%)	4 (40.0%)	0 (0.0%)	2 (20.0%)	0 (0.0 %)	1 (10.0 %)	0 (0.0 %)
50s (n=24)	11 (45.6%)	2 (8.2%)	3 (12.5%)	2 (8.2 %)	0 (0.0 %)	3 (12.5 %)	3 (12.5%)
60s (n=49)	23 (46.9%)	8 (16.3%)	8 (16.3%)	4 (8.2%)	1 (2.0 %)	5 (10.2%)	0 (0.0%)
70s (n=39)	18 (46.2%)	9 (23.1%)	4 (10.3%)	0 (0.0%)	1 (2.6 %)	1 (2.6 %)	6 (15.4 %)
80s (n=6)	1 (16.7%)	2 (33.3%)	2 (33.3 %)	1 (16.7 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)
Total 128	56 (43.8%)	25 (19.5%)	17 (13.3%)	9 (7.0%)	2 (1.6%)	10 (7.8%)	9 (7.0%)
Female	Female (n=169)						
	0.60%	0.80%	1.00%	1.20%	1.40%	1.60%	1.60% more
40s (n=23)	12 (52.2 %)	2 (8.7 %)	4 (17.4 %)	1 (4.3 %)	2 (8.7 %)	1 (4.3%)	1 (4.3 %)
50s (n=39)	19 (48.7 %)	11 (28.2 %)	2 (5.1 %)	0 (0.0 %)	5 (12.8%)	0 (0.0 %)	2 (5.1 %)
60s (n=67)	32 (47.8 %)	17 (25.4 %)	5 (7.5 %)	2 (3.0 %)	4 (6.0%)	3 (4.5 %)	4 (6.0 %)
70s (n=37)	16 (43.8 %)	9 (24.3%)	4 (10.8 %)	1 (2.7 %)	2 (5.2%)	2 (5.4%)	3 (8.1)
80s (n=3)	1 (33.3 %)	1 (33.3 %)	0 (0.0 %)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (33.3 %)
Total 169	80 (47.3%)	40 (23.7%)	15 (8.9%)	4 (2.4%)	13 (7.7%)	5 (3.6%)	11 (6.5%)

A binomial logistic regression analysis was used. The objective variable was subjective dizziness, and the explanatory variables were subjective tinnitus, headache, taste, smell, taste test results, and smell test results.

Table 11 shows the relationship with diseases that can be understood from the questionnaire results. As for items related to dizziness, the results of obesity, urinalysis, fundus examination, lipid examination, and inflammation examination were shown.

It was shown that subjective dizziness is related to the obesity, dermatitis, swollen eyes, and coughing.

Table 11 Results of binomial logistic analysis of subjective dizziness and other test results （Variables included in the regression equation（partial regression coefficient ・ confidence interval）

Variable	ience intervals for partial regression coefficient			confidence interval for the odds		ce test for partial regression co				
	egression coa	ndard er	artial regression	lower limit	Upper limit	Odds ratio	lower limit	Upper limi	Wald	ree of free	P value	: *P<0.05, **P0.01
Gender	0.2358	0.4563	0.1168	-0.5686	1.1301	1.2569	0.5176	3.096	0.267	1	0.6054	
Age	-0.0281	0.0223	-0.2786	-0.0718	0.0156	0.9723	0.9307	1.0157	1.5923	1	0.207	
Urology comperhensive judgment	0.1206	0.3392	0.0872	-0.5441	97,854	1.1282	0.5803	2.1933	0.1265	1	0.7221	
Summary Obesity	0.9144	0.4202	0.5145	0.0908	1.738	2.9453	1.095	5.6859	4.7351	1	0.0296	*
Summary Urinalysis	-1.3025	0.4709	-0.8078	-2.2254	-0.3796	0.2719	0.108	0.6842	7.651	1	0.0057	**
Summary blood pressure	0.0665	0.1689	0.0862	-0.2645	0.3975	1.0687	0.7676	1.4881	0.1549	1	0.6939	
Summary electrocardiogram	-0.6185	0.3584	-0.4027	-1.3209	0.0838	0.5387	0.2669	1.0874	2.9793	1	0.0843	
Summary fundus examination	-0.8972	0.3451	-0.7467	-1.5736	-0.2208	0.4077	0.2073	0.8019	6.7586	1	0.0093	**
Sunnary anemia test	-0.9506	0.4669	-0.4718	-1.7658	0.0646	0.4272	0.1711	1.0667	3.3183	1	0.0685	
Summary diabetes test	-0.1668	0.3191	-0.15	-0.7922	0.4585	0.8464	0.4529	1.5818	0.2733	1	0.6011	
Summary liver function tests	-0.0623	0.3552	-0.0372	-0.7586	0.634	0.9396	0.4683	1.8851	0.0307	1	0.8608	
Summary renal function test	0.3575	0.4253	0.1896	-0.4761	1.1911	1.4298	0.6212	3.2907	0.7065	1	0.4006	
Summary lipid test	0.7125	0.174	0.9736	0.3714	1.0535	2.039	1.4497	2.8678	16.7599	1	0.0001	**
Summary gout test	0.8081	0.4639	0.3312	-0.1011	1.7174	2.2437	0.9038	5.57	3.0347	1	0.0815	
Summary inflammation test	6.1317	1.0427	1.8617	4.088	8.1755	460.235	59.6203	3552.754	34.5789	1	0.0001	**

In addition, Table 12 shows the results of the comparison with the questionnaire results in the field of otolaryngology. A subjective feeling of dizziness was shown to be associated with tinnitus, headache, and measured olfactory test results. There was a statistically significant difference between subjective dizziness and odor test results.

Table 12 Results of binomial logistic analysis of subjective dizziness and otorhinolaryngology test results （Variables included in the regression equation（partial regression coefficient ・ confidence interval）

Variable	ence intervals for partial regression coefficient			confidence interval for the odds		ce test for partial regression co				
	regression coef	andard er	artial regression	lower limit	Upper limi	Odds ratio	lower limit	Upper limi	Wald	ree of free	P value	: *P<0.05, **P0.01
Gender	0.026	0.343	0.0128	-0.6463	0.6983	1.0263	0.524	2.0102	0.0057	1	0.9397	
Age	-0.0085	0.0164	-0.0844	-0.0407	0.0237	0.9915	0.9601	1.024	0.268	1	0.6047	
Subjective tinnitus	0.7556	0.2339	0.4846	0.2972	1.214	2.1289	1.346	3.367	10.436	1	0.0012	**
Subjective headache	1.304	0.5007	0.3518	0.3227	2.2854	3.6842	1.3809	9.8294	6.7835	1	0.0092	**
Subjective sense of smell	-0.421	0.253	-0.28	-0.9169	0.0749	0.6564	0.3997	1.0777	2.7691	1	0.0961	
Subjective sense of taste	-0.443	0.3099	-0.2106	-1.0517	0.1631	0.6413	0.3494	1.1771	2.0558	1	0.1516	
Taste 3-level evaluation	-0.3615	0.3445	-0.3114	-1.0367	0.3137	0.6967	0.3546	1.3685	1.1009	1	0.2941	
Smell 3-level evaluation	0.1258	0.387	0.0864	-0.6327	0.8844	1.1341	0.5311	2.4214	0.1057	1	0.7451	
Olfactory measurement value	0.1921	0.0976	0.5367	0.0009	0.3833	1.2118	1.009	1.4672	3.8778	1	0.0489	*
Salt taste measurement value	0.7597	0.7422	0.2932	^0.6951	2.2144	2.1376	0.499	9.1561	1.0475	1	0.3061	

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IV. Discussion

From the results of this study, the degree of obesity, urine test results, fundus test results, lipid test results, and inflammation test results were shown as items related to subjective dizziness. In particular, it was revealed that the relationship with inflammatory reaction is substantial. In otolaryngology, there was a relationship between tinnitus, headache, olfactory perception tests results, and subjective dizziness.

Since participants with a higher olfactory recognition rate feel subjective dizziness, it may be that the dizziness is caused by being sensitive to odors. No relationship was found with the results of the questionnaire on food intake. This finding follows the previous report on questionnaire responses (the subjective evaluation of sensory functions) which differed from the sensory test result1-6). In the future, it will be necessary to investigate in detail the relationship between subjective dizziness and olfactory test results. Moreover, we need to investigate in detail the relationship between subjective dizziness and inflammation test results.

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