Tokai J Exp Clin Med., Vol. 51, No. 1, pp. 13-22, 2026

Nationwide Online Stress Survey of 100,000 People in Japan

Yuki MATSUKI[*1], Takashi HARUKI[*2], Kei MIZUNO[*3],
Yasuyoshi WATANABE[*3], Hideki KATANO[*4] and Hideaki MATSUKI[*5]

[*1]*Faculty of Nursing, Tokai University School of Medicine*
[*2]*Japan Recovery Association*
RIKEN Center for Biosystems Dynamics Research
[*3]*Kobe University Graduate School of Science, Technology and*
Innovation Center for Health Science Innovation, Osaka Metropolitan University
RIKEN Center for Biosystems Dynamics Research
[*4]*Japan Recovery Association*
Hakujikai Institute of Gerontology
RIKEN Center for Biosystems Dynamics Research
[*5]*Former Faculty of Nursing, Tokai University School of Medicine*

(Received August 19, 2025; Accepted November 26, 2025)

Purpose: The purpose of this study was to obtain basic data for stress management by clarifying the current state of stress among the general public and how they cope with stress.
Method: An online survey was conducted on 100,000 men and women registered with an online survey company.
Results: Respondents with stress test scores of 77 or more were classified as the high-stress group and those with scores below 77 were classified as the non-high-stress group. The proportion of men and women in the high-stress group was 14.8% and 17.7%, respectively. By age, the proportion of men and women in their 20s and 30s was significantly higher than other age groups. For both men and women, the most common ways to deal with stress were "sleeping" and " bathing." In the high-stress group, the most common ways to deal with stress were "receiving chiropractic massage" for men and "spending time in the bathroom" for women. A binomial logistic regression analysis revealed that factors influencing the high-stress group included "short sleep time," "long working hours," and "low household income."
Conclusions: The stress factors and coping methods revealed in this study are considered to be important health issues for the entire nation, and we believe that this report will contribute to preventive medicine and public health, which aim to reduce stress among the general public.

Key words: Stress checks, Stress relief methods, Web surveys

INTRODUCTION

According to the 2019 Basic Survey on National Living Conditions, 47.9% of people aged 12 and over complained of worries or stress in their daily lives, with 43.0% of men and 50.6% of women reporting this by gender [1].

In addition, regarding the issue of stress in the workplace, the Ministry of Health, Labor and Welfare published the "Guidelines for maintaining and promoting the mental health of workers" (Mental Health Guidelines) [2] in 2006. Furthermore, with the amendment of the Act in 2015, workplaces with 50 or more employees are required to conduct stress checks on all workers once a year (mandatory), and, based on the results, they are required to provide interview guidance by a doctor (individual response) and improve the workplace environment (group response) for those with high stress (Industrial Safety and Health Act, 2014). According to the implementation manual for the stress check system based on this law, it has been reported that the high-stress group of workers is about 13% [3].

Stress responses manifest in psychological, physical, cognitive, and behavioral aspects, and if left untreated, can lead to serious illnesses such as depression and cardiovascular disease. This type of stress has a significant impact on the health of not only workers, but also the general public.

To date, there have been a relatively large number of studies on fatigue and stress in workers, primarily in the field of industrial hygiene, but there have been few surveys of the general public. Getting the entire public to take some kind of initiative to reduce stress in their daily lives is important from the perspective of preventive medicine and public health, and is also thought to be useful in that it is expected to be effective in reducing the burden of medications and medical expenses for stress-related illnesses.

The purpose of this study was to obtain basic data for stress management by clarifying the current state of stress among the general public and how it is relieved.

Yuki MATSUKI, Faculty of Nursing, Tokai University School of Medicine, 143 Shimokasuya, Isehara, Kanagawa 259-1193, Japan
Tel: +81-463-93-1121 E-mail: y.matsuki@tokai.ac.jp

Table 1 Short-Term Occupational Stress Questionnaire B (29 items)

Please answer the following questions concerning your health during the past month by circling the number that best fits your situation.

		Almost never	Sometimes	Often	Almost always
1.	I have been very active	1	2	3	4
2.	I have been full of energy	1	2	3	4
3.	I have been lively	1	2	3	4
4.	I have felt angry	1	2	3	4
5.	I have been inwardly annoyed or aggravated	1	2	3	4
6.	I have felt irritable	1	2	3	4
7	I have felt extremely tired	1	2	3	4
8.	I have felt exhausted	1	2	3	4
9.	I have felt weary or listless	1	2	3	4
10.	I have felt tense	1	2	3	4
11.	I have felt worried or insecure	1	2	3	4
12.	I have felt restless	1	2	3	4
13.	I have been depressed	1	2	3	4
14.	I have thought that doing anything was a hassle	1	2	3	4
15.	I have been unable to concentrate	1	2	3	4
16.	I have felt gloomy	1	2	3	4
17.	I have been unable to handle work	1	2	3	4
18.	I have felt sad	1	2	3	4
19.	I have felt dizzy	1	2	3	4
20.	I have experienced joint pains	1	2	3	4
21.	I have experienced headaches	1	2	3	4
22.	I have had a stiff neck and / or shoulders	1	2	3	4
23.	I have had lower back pain	1	2	3	4
24.	I have had eyestrain	1	2	3	4
25.	I have experienced heart palpitations or shortness of breath	1	2	3	4
26.	I have experienced stomach and / or intestine problems	1	2	3	4
27.	I have lost my appetite	1	2	3	4
28.	I have experienced diarrhea and / or constipation	1	2	3	4
29.	I haven't been able to sleep well	1	2	3	4

Quote from: https://www.mhlw.go.jp/bunya/roudoukijun/anzeneisei12/dl/stress-check_e.pdf

METHOD

Survey subjects

An online survey was conducted from April 2023 to July 2023 targeting 100,000 men and women aged 20 to 70 who are registered as monitors with a web survey company (Macromill, Inc.).

The web research company (Macromill, Inc.) is one of Japan's leading research companies, and among its business activities is providing services and solutions to support the research activities of companies, research institutions, and other organizations. The company collects various data from a domestic consumer panel of over 1.3 million people and provides it to companies, research institutions, and other organizations. The 100,000 survey subjects for this survey were selected by Macromill using a stratified sampling method based on the national census. In exchange for their cooperation in the survey, participants will be able to earn points that can be redeemed for products.

Questions included gender, age, prefecture of residence, marital status, whether or not they have children, household income, occupation, 29 stress check items, fatigue recovery and relaxation methods that the subjects use daily (157 items), commuting time, working hours, housework time, sitting time, gaming time, sleep time, exercise habits, etc.

Stress check items were measured using item B (29 items) of the Simple Occupational Stress Questionnaire [4]. The contents of this questionnaire are shown in Table 1 (Table 1). Stress was classified based on the "method of selecting 'high stress individuals' based on numerical criteria" [5], with those scoring 77 points or above being classified as the "high stress group" and those scoring less than 77 points as the "non-high stress group." Note that this evaluation indicates that the higher the score, the higher the level of stress.

Statistical analysis

To examine the attributes of the subjects, cross-tabulations were performed by gender, age, region of residence (by region), marital status, presence or absence of children, household income, and occupation.

Next, the percentage of high-stress subjects was

Table 2 Number of subjects by age and gender

By age and gender

	< Male >		< Female >		< Total >	
Age group	Number	(%)	Number	(%)	Number	(%)
20～24	487	1.0	1301	2.7	1788	1.8
25～29	1460	2.9	4164	8.5	5624	5.6
30～34	2555	5.0	6015	12.3	8570	8.6
35～39	3696	7.2	6545	13.4	10241	10.2
40～44	5047	9.9	6155	12.6	11202	11.2
45～49	7349	14.4	6282	12.9	13631	13.6
50～54	8917	17.4	5922	12.1	14839	14.8
55～59	8535	16.7	4490	9.2	13025	13.0
60 or older	13153	25.7	7927	16.2	21080	21.1
Total	51199	100.0	48801	100.0	100000	100.0

Region of residence and gender

	< Male >		< Female >		< Total >	
Region	Number	(%)	Number	(%)	Number	(%)
Hokkaido	1791	3.5	1428	2.9	3219	3.2
Touhoku	4294	8.4	3723	7.6	8017	8.0
Kanto	16716	35.7	15574	31.9	32290	32.3
Chube	10255	20.0	9619	19.7	19874	19.9
Kinki	7443	14.5	7527	15.4	14970	15.0
Chugoku	2980	5.8	3059	6.3	6039	6.0
Shikoku	2146	4.2	2226	4.6	4372	4.4
Kyuusyuu	5574	10.9	5645	11.6	11219	11.2
Total	51199	100.0	48801	100.0	100000	100.0

calculated for each category of gender, age group, employment type, job title, work style, and overtime hours for all subjects and by job type. The percentage of high-stress subjects by job type was also calculated for both men and women.

Statistical tests were performed using the chi-square test for proportions and the Spearman correlation coefficient for correlations.

Furthermore, odds ratios and 95% confidence intervals were calculated using binomial logistic regression analysis (variable elimination method, likelihood ratio) with gender, age, employment type, job title, work style, overtime hours, and the presence or absence of stress relief methods as independent variables, and the determination of high-stress and non-high-stress groups as dependent variables.

The statistical significance level was set at less than 5%, and SPSS Ver 26.0 was used for statistical analysis.

Ethical considerations

This survey was commissioned to the online research company Macromill, and the protection of personal information is described in their "Personal Information Protection Policy" [6].

The first author was a faculty member at Komazawa Women's University School of Nursing until last year and transferred to Tokai University School of Medicine this year (2025). This study was approved by the Ethics Review Committee of Komazawa Women's University School of Nursing last year (approval number 2022-N24).

RESULTS

Subject attributes

The number of participants in this survey of 100,000 individuals by age, gender, and residence area was shown in Table 2. The total number of subjects in this survey was 51,199 men and 48,801 women. In terms of age, 1.8% were 20-24 years old, 5.6% were 25-29 years old, and 8.6% were 30-34 years old, which was slightly fewer than other age groups, but other age groups were in the 10% range, and those aged 60 or older exceeded 20%.

In terms of region of residence, the Kanto region had a higher composition rate than other regions, with 32.3% for both men and women combined, followed by 19.9% for the Chubu region and 15.0% for the Kinki region.

In terms of marital status, 67.3% of men and 73.1% of women were married. Among the survey subjects, 60.3% of males and 64.0% of females had children.

Table 3 shows the number of participants by annual household income and occupation. In terms of annual household income, 21.0% of participants had an annual income of 4 to 6 million yen, which was higher than the other groups. However, there were approximately 23,000 participants who refused to answer or whose answer was unknown.

In terms of the number of participants by occupation, the majority of male participants were company employees (16.8% office workers, 24.1% technical workers, and 25.7% other company employees), while

Table 3 Number of subjects

By annual income and gender

	< Male >		< Female >		< Total >	
Annual income (Yen)	Number	(%)	Number	(%)	Number	(%)
Less than 2 million	2106	4.1	2662	5.5	4768	4.8
200～400	8577	16.8	8970	18.4	17547	17.6
400～600	11501	22.5	9444	19.4	20945	21.0
600～800	9154	17.9	6245	12.8	15399	15.4
800～1000	5871	11.5	3261	6.7	9132	9.1
1000～1200	3083	6.0	1449	3.0	4532	4.5
1200～1500	1929	3.8	760	1.6	2689	2.7
1500～2000	916	1.8	397	0.8	1313	1.3
Over 20 million	567	1.1	260	0.5	827	0.8
Not clesr	7495	14.6	15353	31.5	22902	22.9
Total	51199	100.0	48801	100.0	100000	100.0

By occupation and gender

	< Male >		< Female >		< Total >	
Occupation	Number	(%)	Number	(%)	Number	(%)
Civil servant	3854	7.5	931	1.9	4785	4.8
Manager/executive	2002	3.9	127	0.3	2129	2.1
Company employee (clerical work)	8607	16.8	6783	13.9	15390	15.4
Company employee (technical work)	12334	24.1	1741	3.6	14075	14.1
Company employee (other)	13173	25.7	4792	9.8	17965	18.0
Self-employed	5337	10.4	990	2.0	6327	6.3
Freelance	1485	2.9	554	1.1	2039	2.0
Full-time housewife/househusband	466	0.9	21992	45.1	22458	22.5
Part-time/temporary work	3041	7.7	10891	22.3	14832	14.8
Total	51199	100.0	48801	100.0	100000	100.0

the majority of female participants were full-time housewives at 45.1%, followed by company office workers and clerical workers at 13.9%.

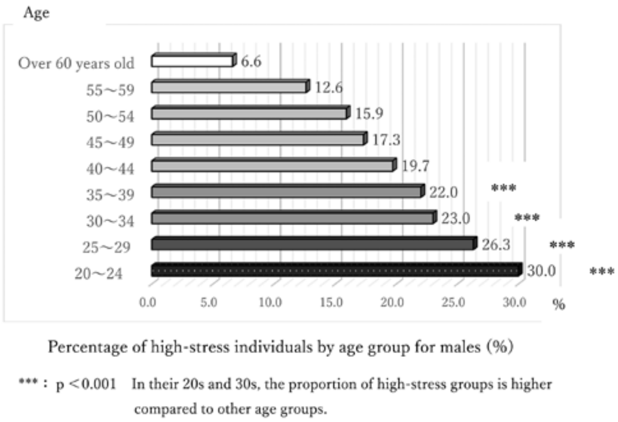
High-stress situation

The Ministry of Health, Labour and Welfare's Occupational Stress Short Questionnaire (B) [4] used in this study has 29 items and is a four-point scale, with a maximum score of 116 points (Table 1). According to the Ministry of Health, Labour and Welfare's standards, a score of 77 or higher is classified as high stress [5]. This survey also followed these standards.

The proportion of men in the high-stress group was 14.8%, while the proportion of women in the high-stress group was 17.7%, with women being significantly more likely to be in the high-stress group ($p < 0.001$). In addition, by age, the proportion of those in their 20s and 30s was significantly higher than other age groups for both men and women ($p < 0.001$) (Fig. 1).

Fig. 2 shows the proportion of high-stress groups by region of residence. There was no significant difference in the proportion of high-stress groups by region of residence for men, but, for women, the proportion of women in the high-stress group was 22.0% in the Tohoku region, which was significantly higher than other regions ($p < 0.001$).

Regarding the presence or absence of children,



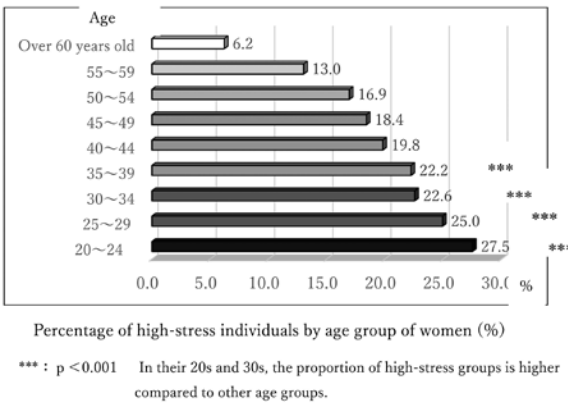
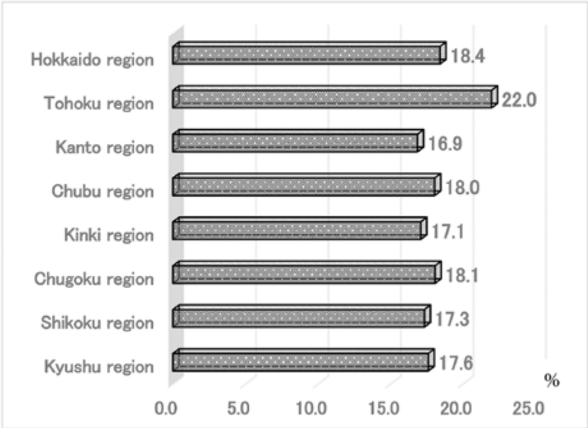
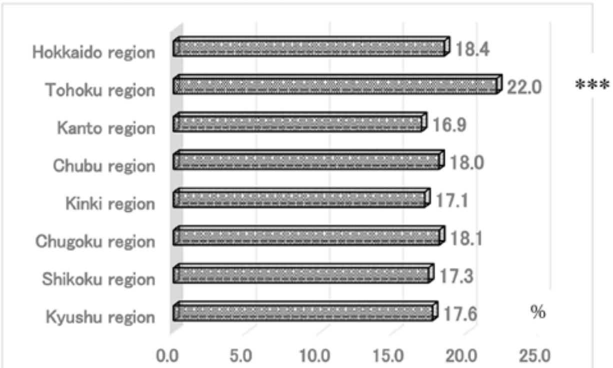


Fig. 1 Percentage of High Stress by Age and Gender (%)



Percentage of high stress by residential area of men (%)



Percentage of high stress among women by residential area (%)

*** p<0.001 : The proportion of high-stress women in the Tohoku region i higher compared to other regions.

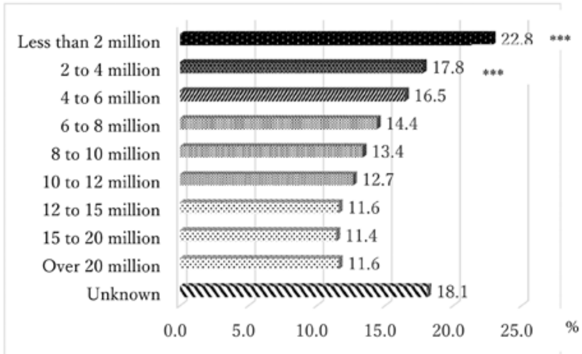
Fig. 2 Percentage of High Stress by Residence Area and Gender (%)

the high stress rate for men with children was 17.7% compared to 12.9% for those without children, which was significantly higher in the "with children" group ($p < 0.001$), and, for women too, the high stress rate was 21.6% for the "with children" group and 15.6% for the "without children" group, with the high stress rate being significantly higher in the "with children" group than in the "without children" group ($p < 0.001$).

Regarding annual household income, as shown in Fig. 3, the rate of high stress was higher in the low-annual-income groups of less than 2 million yen and 2 to 4 million yen compared to other income groups ($p < 0.001$).

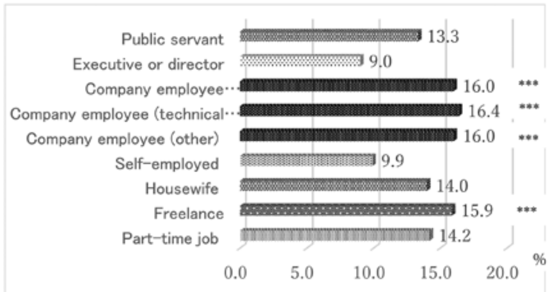
Regarding the rate of high stress by occupation, for men, company employees (clerical, technical, etc.) were in the 16% range, which was significantly higher than other occupations ($p < 0.001$).

Although there were only 466 full-time househusbands out of 51,199 men, the proportion of those with high stress was 15.9%, a higher rate than managers/executives and freelancers ($p < 0.001$). Furthermore, the high stress percentage among female company employees (administrative positions, technical positions, and others) exceeded 20%, which was higher than that of other occupations ($p < 0.001$) (Fig. 4).



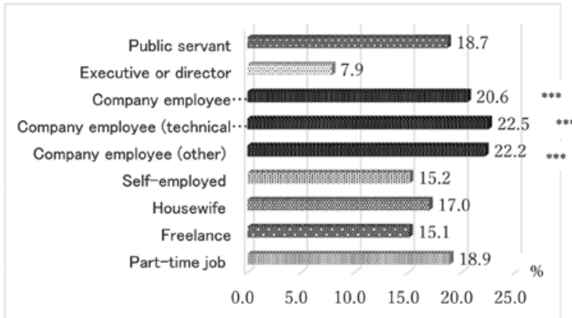
***: p<0.001 The groups with an annual income of less than 2 million yen and between 2 million to 4 million yen have a higher proportion of high stress compared to other higher income groups.

Fig. 3 Percentage of High Stress by Annual Household Income (%)



Percentage of high stress by male occupation (%)

*** : p <0.001 The proportion of company employees (administrative, technical, and others) is significantly higher than that of other occupations with p<0.001, and the proportion of full-time househusbands is also significantly higher than that of other occupations excluding company employees with p<0.001.



Percentage of high stress by occupation among women (%)

*** : p <0.001 Company employees (administrative positions, technical positions, and others) have a significantly higher rate compared to other occupations with p < 0.001.

Fig. 4 Percentage of High Stress by Gender by Occupation (%)

Rank correlation between stress check raw score and working hours, etc.

The correlation coefficients between the total stress check raw score (maximum 116 points) and commuting time, working hours, sleeping time, and relaxation time in the high-stress group were calculated. As the stress check raw score and each period (of commuting, of working, etc.) were asked on an ordinal scale, Spearman's rank correlation coefficient was calculated. As a result, as shown in Table 3, for both men and women, there was a positive correlation between commuting time and working hours, and a negative correlation between sleeping time and relaxation time (both $p < 0.001$).

Table 4 Rank correlation coefficients between stress check scores

< Male >

	Commute time	Working hours	Sleep time	Relaxation time
Degree	7499	7499	7573	7573
Correlation Coefficient	0.182**	0.257**	-0.315**	-0.231**

***p < 0.001

< Female >

	Commute time	Working hours	Sleep time	Relaxation time
Degree	5338	5338	8662	8662
Correlation Coefficient	0.102**	0.136**	-0.296**	-0.184**

***p < 0.001

Table 5 Stress Reduction Methods for All Subjects by Gender

< Male >

Rank	Item	Implementation %
1	Sleep	41.9
2	Take a bath	38.9
3	Drink coffee	33.0
4	Watch free videos like YouTube	29.5
5	Watch TV	29.4
6	Drink alcoholic beverages	25.9
7	Go for a walk, job	20.9
8	Take a nap	20.6
9	Listen to music	20.1
10	Eat chocolate	19.8

< Female >

Rank	Item	Implementation %
1	Sleep	53.1
2	Take a bath	45.2
3	Eat chocolate	40.2
4	Eat sweet things (other than chocolate)	39.7
5	Drink coffee	37.1
6	Watch TV	35.9
7	Lying down or taking a relaxed posture	35.0
8	Watch free videos like YouTube	33.1
9	Spending time with family	28.8
10	Take a nap	26.1

Methods for reducing stress

A survey of 100,000 subjects was conducted, with multiple answers allowed for 157 ways they reduce stress daily (recovering from fatigue, relaxation, etc.). The results are shown in Table 5, ranked 1st to 10th by gender. The most common answer for both men and women was "sleeping: 41.9% for men and 53.1% for women," followed by "bathing: 38.9% for men and 45.2% for women." For men, the third place was "drinking coffee: 33.0%," the fourth place was "watching free videos: 29.5%," and the fifth place was "watching TV: 29.4%." For women, the third place was "eating chocolate: 40.2%," the fourth place was "eating something sweet (other than chocolate: 39.7%)," and the fifth place was "drinking coffee: 37.1%."

Table 6 shows the top ten responses to multiple-choice questions about stress reduction methods in the high-stress group. The most common method for men was "receiving chiropractic massage: 29.9%," followed by "using cooling products: 28.2%" and "playing games at an arcade: 27.2%." For women, the top answer was "spending time in the bathroom: 28.1%," followed by "having your fortune told: 27.7%" and "using cooling products: 25.2%."

Binary logistic analysis

To examine the impact of high stress, a binary logistic regression analysis was conducted separately for men and women. Specifically, the dependent variable was categorized based on the scores from the Occupational Stress Questionnaire, with scores of 77 or higher classified as the "high-stress group: 1"

Table 6 Stress Reduction Methods for High Stress Group

< Men in the high-stress group >

Rank	Item	Implementation %
1	Receive a massage	29.9
2	Use cooling products	28.2
3	Trampoline	27.2
4	Request housework assistance	27.1
5	Fix hair	26.6
6	Receive a fortune-telling	26.3
7	Healing-related items like candles	26.2
8	Use warming products	25.0
9	Go to a head spa	25.0
10	Glamping	24.3

< Women in the high-stress group >

Rank	Item	Implementation %
1	Stay in the toilet	28.1
2	Receive a fortune telling	27.7
3	Use cool items	25.2
4	Look for handsome men	24.9
5	Games (arcade)	24.3
6	Gamble	23.9
7	Fast	23.0
8	Drink carbonated water (with sugar)	22.4
9	Wear an eye mask to block vision	21.3
10	Games (like Switch, PS5, etc.)	21.0

and scores below 77 classified as the "non-high-stress group: 0." The independent variables included age, residential area categorized into 8 regions (Hokkaido, Tohoku, Kanto, Chubu, Kinki, Chugoku, Shikoku, and Kyushu), marital status (married: 1; unmarried: 0) presence of children (children present: 1; no children: 0), annual family income (less than 6 million yen: 1; 6 million yen or more: 0), occupation (public servant, business owner, office worker, technical employee, other office worker, self-employed, freelance, full-time housewife (husband), part-time worker, student, other, or unemployed), commuting time (2 hours or more one way: 1; less than 2 hours one way: 0), working hours (8 hours or more: 1; less than 8 hours: 0), and sleep duration (less than 6 hours: 1; 6 hours or more: 0).Furthermore, regarding stress relief methods, for men, the presence or absence of items such as "receiving chiropractic massage (Yes: 1; No: 0)," "using cooling products (Yes: 1; No: 0)." "gaming (arcade) (Yes: 1; No: 0)," "drinking carbonated water (with sugar) (Yes: 1; No: 0)," and "having your fortune told (Yes: 1; No: 0)" was considered. For women, the presence or absence of items such as "spending time in the bathroom (Yes: 1; No: 0)," "having your fortune told (Yes: 1; No: 0)," "using cooling products (Yes: 1, No: 0)," "looking for handsome men (Yes: 1, No: 0)," and "gaming (arcade) (Yes: 1, No: 0)" was also taken into account.

From the results of Table 7, those in households with an income of less than 6 million yen have a 1.825 times higher risk of experiencing high stress compared to those with an income of 6 million yen or more. Office workers have a 1.232 times higher risk, technical workers have a 1.168 times higher risk, and other staff have a 1.171 times higher risk. Additionally, those with less than 6 hours of sleep have a 1.849 times higher risk of high stress compared to those who sleep 6 hours or more. On the other hand, stress relief methods such as "receiving chiropractic massage," "using warming products," and "using cooling products" have odds ratios of 0.845, 0.912, and 0.953 respectively, suggesting they are helpful in reducing high stress. For women, those in households with an income of less than 6 million yen have a 1.729 times higher risk of experiencing high stress compared to those with an income of 6 million yen or more. Those who work more than 8 hours have a 1.521 times higher risk compared to those who do not, and those with less than 6 hours of sleep have a 1.888 times higher risk compared to those who sleep 6 hours or more. Additionally, being self-employed has an odds ratio of 0.724 compared to other professions, indicating a lower risk of high stress. It is also considered that the stress relief method of "spending time in the bathroom" has an odds ratio of 0.787, suggesting it helps to reduce high stress.

DISCUSSION

Consideration of the percentage of people with high stress

The criteria listed in the manual for the stress check system by the Ministry of Health, Labor and Welfare were set with the aim of ensuring that the percentage of people judged to be highly stressed is approximately 10% from the perspective of system operation [8]. However, the percentage of people with high stress in

Table 7 Results of the Binary Logistic Regression Analysis

< Male >

	Odds ratio	Odds ratio 95% confidence interval		Significant probability
		Lower limit	Upper limit	
Household income	1.825	1.567	1.967	***
Working hours	1.524	1.126	1.847	***
Office worker	1.232	1.152	1.317	***
Technical employee	1.168	1.098	1.243	***
Other company employees	1.171	1.102	1.242	**
Sleep time	1.849	1.775	1.926	***
Chiropractic massage	0.845	0.726	0.924	**
Warm sensation goods	0.912	0.758	0.985	**
Cold sensation goods	0.953	0.847	0.967	**

< Female >

	Odds ratio	Odds ratio 95% confidence interval		Significant probability
		Lower limit	Upper limit	
Household income	1.729	1.365	2.124	***
Freelance	0.724	0.576	0.911	***
Working hours	1.152	1.074	1.232	**
Sleep time	1.888	1.775	2.009	***
Hiding in the toilet	0.787	0.541	0.878	***

** $p < 0.01$, *** $p < 0.001$

this study was 14.8% for men and 17.7% for women, which was higher than 10%. The subjects of this survey were the general population, but, since the percentage of people with high stress is likely to differ depending on the industry and occupation of the target group, it is believed that consideration of stress checks targeting the general population, such as those conducted in this study, will be important in the future when considering the health of the entire nation.

In addition, the reason that women had a higher rate of high stress than men is thought to be due to both biological factors caused by fluctuations in female hormones and socio-psychological factors associated with experiencing various life events such as marriage, pregnancy, childbirth, child-rearing, and elderly care at the same time as career development [9].

As shown in Fig. 1, the proportion of high stress was higher in the 20s and 30s than in other age groups. It has been reported that mental illness is most prevalent in the 20s and 30s, and the proportion is on the rise [10]. There are also reports that mental instability is occurring among younger generations [11]. One of the reasons for the high sense of job incompetence among young employees is that they have little work experience and are in the process of establishing their professional identity [11]. It is thought that they tend to experience high levels of stress. To deal with this, it is necessary to understand the young employees' awareness of their suitability and abilities, and how they perceive the qualitative and quantitative workload when they are assigned or transferred, and to consider measures to create and maintain job satisfaction and motivation in the workplace.

Regarding household income and stress, the proportion of high-stress groups was higher in the low-annual-income groups of less than 2 million yen and 2 to 4 million yen than in other income groups. According to the 2022 (Reiwa 4) *Basic Survey on Living Conditions of the People* the average income per household in 2021 (Reiwa 3) was 5,457,000 yen for "all households" and the median was 4,230,000 yen [12]. There are also other reports that low income leads to high stress [13].

Looking at the prevalence of high stress by occupation, the prevalence of high stress was high among company employees for both men and women. Furthermore, as shown in Table 3, there was a positive correlation between the total raw stress check score, commuting time, and working hours, with long commute times and long working hours influencing high raw stress check scores. These results are consistent with those already reported in many reports [2–4, 7].

In recent years, company employees have faced a number of employment issues, including restructuring, the introduction of annual salary systems and discretionary labor systems, the collapse of the lifetime employment system, and problems with interpersonal relationships in the workplace. Against this background, it is thought that the prevalence of high stress among company employees is higher than in other occupations.

Stress reduction methods

Stress-coping behavior

One of the personal factors that affect stress is stress-coping behavior, which has been the subject of much discussion. According to the theoretical model of psychological stress systematized by Lazarus *et al.* [14], people cognitively evaluate the events and challenges they encounter. This evaluation consists of a primary evaluation of whether a specific loss has occurred, whether it is a threat, and whether growth can be achieved by overcoming it, and a secondary evaluation of whether they themselves can handle it. If the cognitive evaluation determines that the situation is highly stressful, negative emotions arise, and motivation is provided to reduce and eliminate those emotions. Stress-coping behavior is defined as a process of cognitive and behavioral efforts, and plays a role in mediating between stress factors and stress responses.

Sleep and mental health

The most common method of dealing with stress used by the subjects of this survey was "sleeping." Regarding the physiological effects of sleep and mental health, the physiological basis of the impact of sleep on mental health has been discussed, while the relationship between sleep problems and mental health disorders is widely known. That is, the impact on the hypothalamic-pituitary-adrenal axis (HPA axis) is the neuroendocrine system that controls internal activities, including stress responses, through interactions between the hypothalamus, pituitary gland, and adrenal glands. In an experiment in which healthy adults were subjected to control of sleep time and blood cortisol levels were measured, it was shown that even a partial and sudden reduction in sleep time delayed the recovery of the HPA axis from circadian stimuli (stimuli such as light that properly regulate biological rhythms) [15]. In addition, a review of papers on the impact of sleep on the HPA axis concluded that a reduction in objective and subjective sleep quality increases the stress reactivity of the HPA axis [16]. The impact of enhanced stress reactivity on physical and mental health is well documented, and it has been suggested that HPA axis sensitization may be an important factor linking inadequate sleep to stress-related pathologies.

Bathing and stress relief

The second most common stress-coping behavior among survey participants was "bathing." Many reports have shown that bathing increases parasympathetic nervous activity, which leads to stress relief [17, 18].

Ingestion of sweet foods and stress relief

As a way to relieve stress, "eating something sweet" is a way to relieve stress. When you feel the sweetness, the stimulation is transmitted to the brain, and the brain secretes two types of neurotransmitters, "endorphins" and "serotonin." It is believed that these two substances have the effect of relaxing and reducing stress. "Endorphins" increase resistance to disease and have the effect of calming the mind and making you feel relaxed. On the other hand, "serotonin" is a neurotransmitter necessary for stabilizing mood, and 90% of it is found in the cells of the mucous membrane of the small intestine. Serotonin is a substance that excites the brain, but it is also one of the emotional substances that encourage a depressed mind and calm the mind while suppressing emotional outbursts.

Spending time in the bathroom and stress relief

A high percentage of women in the high-stress group chose "spending time in the bathroom" as a way to relieve stress. From a medical perspective, this method of relieving stress is caused by anger and losing your temper, which arise in the limbic system. This reaction occurs quickly. Meanwhile, anger is suppressed by the frontal lobe, which is responsible for intelligence, personality, reason, and language. The frontal lobe has a complex structure and takes time to wake up. It is thought that people rush to the bathroom to buy time until the frontal lobe wakes up. It is also thought that rushing to a small space like a bathroom rather than a large space provides a sense of security.

Logistic analysis results: Factors related to high stress judgment

A binomial logistic regression analysis was performed on the characteristics of the high-stress group, and the results showed that the causes of high stress for men in the high-stress group were "short sleep time", "low annual household income", "long working hours", "office worker", and "other company employee", while the causes of high stress for women were "short sleep time", "low household income", and "long working hours". On the other hand, factors related to the relief of high stress were calculated to be "receiving chiropractic massage", "using warming products", and "using cooling products" for men, and "spending in the bathroom" for women.

Regarding the relationship between length of working hours and stress, similar to the results of this survey, a dose-response relationship was observed between overtime hours and high stress assessment, with reports showing that the longer the overtime hours, the more people who were assessed as having high stress [19] and that, while companies generally set a standard of 45 hours or more overtime per month, some reports have found a significant association with high stress even for relatively low overtime hours of 20 hours or more per month [3]. Furthermore, there are reports that working hours that are subjectively longer than the objective working hours [19] and having little discretion over working hours and vacation time are associated with levels of depression [20].

The results of this survey show the importance of taking health management measures for long working hours, not only for workers but for the general public as well.

Regarding the relationship between short sleep time and stress, it has been reported that short sleep time and low sleep efficiency are associated with markers of autonomic nervous system tension, which indicate low levels of parasympathetic tone and high levels of sympathetic tone [21]. It is said that continued dominance of the sympathetic nervous system leads to physical and mental disorders, and the impact of sleep on the autonomic nervous system is one aspect of the explanation for the connection between sleep and mental health.

A survey of middle-aged Japanese workers has reported that high levels of work stress factors and overcommitment lead to subsequent insomnia [22]. It has also been reported that there is a U-shaped correlation between weekday sleep time and subjective stress, with people who sleep 6 to 8 hours a day having the lowest subjective stress [23]. Many reports have been published on occupational stress among corporate workers, but this survey has revealed the importance of sleep time not only for corporate workers but also for the general public.

CONCLUSION

The purpose of this study was to obtain basic data on stress management by clarifying the current state of stress among the general public and how they cope with stress. The results showed that 14.8% of men and 17.7% of women felt high levels of stress. Furthermore, stress levels were higher among people in their 20s and 30s than among other age groups. Factors that influenced the high-stress group were also found to include "short sleep time," "long working hours," and "low household income."

Identifying these stress factors and finding ways to prevent and cope with them are considered important health issues for the entire nation, and this report is expected to contribute to preventive medicine and public health efforts aimed at reducing stress among the general public.

ACKNOWLEDGEMENTS

We would like to thank all the subjects who participated in this study. There are no conflicts of interest in this study.

REFERENCES

1) Health, Labour and Welfare Statistics Association. (2023). *Trends in national health 2023/2024*. Tokyo: Health, Labour and Welfare Statistics Association. 75-77.
2) Ministry of Health, Labour and Welfare, Independent Administrative Institution Workers' Health and Safety Organization (2017). *Guidelines for mental health promotion in the workplace for the maintenance and enhancement of workers' mental health*. https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000055195_00002.html (Accessed September 3, 2025)
3) Ooka, M., Odagiri, Y., Kikuchi, H., Takamiya, T., *et al.* (2019). Prevalence of and correlates with high stress among workers by job category according to the Stress Check Program. *Journal of Tokyo Medical College* 77, 285-298.
4) Shimomitu, K. (2005): "Manual for Understanding the Current State of Stress Using the Simple Occupational Stress Questionnaire - For More Effective Measures to Improve the Workplace Environment," Ministry of Health, Labour and Welfare Science Research Grant, FY2002-FY2004, Comprehensive Research on Occupational Safety and Health [Research on Mental Health Measures through Improvements in the Workplace Environment, etc.] https://www.mhlw.go.jp/file/05-Shingikai-11201000-Roudoukijunkyoku-Soumuka/0000050920.pdf (Accessed September 1, 2025)
5) Ministry of Health, Labor and Welfare : Method for identifying "high-stress individuals" based on numerical criteria in the Ministry of Health, Labor and Welfare's "Ministry of Health, Labor and Welfare Stress Check Implementation Program" https://stresscheck.mhlw.go.jp/material.html https://www.mhlw.go.jp/bunya/roudoukijun/anzeneisei12/pdf/150803-1.pdf (Accessed September 1, 2025)
6) Dentsu Macromill Inc.: Personal Information Protection Policy https://www.dm-insight.jp/privacy-policy/ (Accessed August 30, 2025)
7) Ezoe, S., & Morimoto, K. (2000). Work and workplace stress - Episode 8: Job types and stress a) Stress among technical professionals. *Journal of Occupational Health* 42, A29-A31.
8) Special Committee on Stress Check Items and Related Matters https://www.mhlw.go.jp/stf/shingi/other-roudou_203931.html. (Accessed August 30, 2025)
9) Hirasima, N. (2010). *A guide to depression in women for therapists*. Tokyo: Kongo Publishing Company. 13-19.
10) Oda, S. (2006). *White paper of industrial human mental health*, 2006 edition. Tokyo: Mental Health Research Institute. 9-10.
11) Imai, Y. (2003). Mental illnesses that increase in the 30s. *Public Health Nurse Magazine* 59, 434-438.
12) Ministry of Health, Labour and Welfare. *Overview of the 2022 (Reiwa 4) National Survey on Living Standards*. Ministry of Health, Labour and Welfare. https://www.mhlw.go.jp/toukei/saikin/hw/k-tyosa/k-tyosa22/dl/14.pdf. (Accessed August 30, 2025)
13) Sato, T., Maeda, M., Kawata, Y., *et al.* (2022). Association of sources of worry and stress with smoking in Japan: Findings from the Comprehensive Survey of Living Conditions. *Juntendo Medical Journal* 68, 613-621.
14) Lazarus, R.S., & Folkman, S. (1984). Stress, appraisal, and coping. New York: Springer. 105-129.
15) Leproult, R., Copinschi, G., Buxton, O., *et al.* (1997). Sleep loss results in an elevation of cortisol levels the next evening. *Sleep* 20, 865-870.
16) Van Dalfsen, J. H., & Markus, C. R. (2018). The influence of sleep on human hypothalamic-pituitary-adrenal (HPA) axis reactivity: A systematic review. *Sleep Medicine Reviews* 39, 187-194.
17) Maeda, T., Makino, N., & Horiuchi, T. A spa-resort tour in Japan relieves mental and physical stress and corrects serum cortisol levels. *J. Balneol. Climatol. Phys. Med.* 82, 70-77.
18) Ishizawa, T., Itoh, Y., Torii, K., *et al.* (2018). Raising body temperature by 1.1°C during bathing decreases stress. *Japanese Journal of Health and Research* 39, 6-14.
19) Iwasaki, K. (2009). A perspective on the fit of long working hours and healthy working hours for individuals. *Special Research Report of the National Institute of Occupational Health and Safety* 39, 9-10.
20) Takahashi, M. (2009). Discretion over working hours and health. *Specific research reports of the National Institute of Occupational Safety and Health* 39, 11-12.
21) Castro-Diehl, C., Roux, A.V.D., Redline, S., *et al.* (2016). Sleep duration and quality in relation to autonomic nervous system measures: The Multi-Ethnic Study of Atherosclerosis (MESA. *Sleep* 39, 1927-1940.
22) Ota, A., Masue, T., Yasuda, N., *et al.* (2009). Psychosocial job characteristics and insomnia: A prospective cohort study using the Demand-Control-Support (DCS) and Effort-Reward Imbalance (ERI) job stress models. *Steep Med* 10, 1112-1127.
23) Sugita, Y., & Adachi, H. (2015). Graduate students' sleep and research. *Progress in Medicine* 35, 59-63.