

Burnout and poor perceived health in flexible working time in Japanese employees: the role of self-endangering behavior in relation to workaholism, work engagement, and job stressors

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Abstract: The study aim was to examine whether flexible working time was associated with burnout and poor perceived health in relation to the work-related psychological/behavioral factors of self-endangering work behavior (SEWB), workaholism, work engagement, and job stressors. We analyzed data obtained from an Internet survey of 600 full-time Japanese employees. We also proposed a causal model using path analysis to investigate the overall relationships of burnout and perceived health to psychological/behavioral factors. The results indicated that flexible working time was associated with adverse work-related consequences and factors such as increased burnout, working hours, SEWB, workaholism, and job demands, and with positive factors such as improvement of work engagement. The path analysis suggested that burnout was caused by workaholism both directly and via SEWB, and by low job decision latitude, and was reduced by work engagement. Similarly, it was observed that poor health was caused by workaholism via SEWB, and reduced by work engagement. Thus, SEWB is driven by workaholism and plays a key role in the adverse health consequences of flexible working time. For workers to benefit from flexible working time, it is important to improve workaholism, SEWB, and low job decision latitude, and to develop work engagement in the workplace.

Key words: Self-endangering behavior, Workaholism, Work engagement, Job stress, Burnout, Perceived health, Flexible working time

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Introduction

The current increase in the global diversification of work styles is associated with an increase in the number of workers who work flexibly and autonomously owing to flexible working time^{1–3}. This diversification trend has become even more evident with the recent coronavirus pandemic. The introduction of flexible working systems in Japan⁴, such as modified working hours, flextime, discretionary working hours (exempt work), and highly professional systems, is part of this diversification.

Flexible and autonomous work styles are considered to improve worker productivity and work engagement and to promote a good fit between work and personal life^{5–9}. Such new ways of working generate worker autonomy and freedom^{10, 11}. The International Labour Organization recommends flexible work schedules such as flextime arrangements, which have obvious advantages for workers with family responsibilities and life outside work¹². However, it has been suggested that flexible and autonomous working styles increase the burden of self-management and have adverse psychological and physical effects on workers¹³. It has been pointed out that these discrepancies are caused mainly by worker coping behavior¹⁴.

Regarding the working hour system, there is evidence that time-flexible work is associated with less stress, higher levels of commitment to the employer, and reduced costs to the organization because of fewer absences, fewer days late, and fewer missed deadlines¹⁵. In contrast, it is reported that a high variability of working hours is associated with increased impairments in health and well-being; this is particularly true if the variability is company controlled¹⁶. Studies in Japan have shown that flexible working time helps workers to balance work and childcare¹⁷, and work and medical treatment¹⁸. However, a recent survey by the Japanese Ministry of Health, Labour and Welfare reported that exempt employees work longer than those on fixed working time¹⁹. Although working time arrangements are decided by labor-management agreements, Japanese workers are not in a strong position, as indicated by the low labor union organization rate (16.9%, 2021)²⁰. Therefore, the establishment and implementation of labor-management agreements tend to reflect the intentions of companies rather than workers. Additionally, cultural factors specific to Japan may shape both flexible and fixed working time arrangements, such as an emphasis on signals that show commitment/loyalty to the company and one's efforts for others, rather than results/achievements, groupism, hierarchical

relationships, and workload unrelated to core business²¹.

Some researchers have noted the overadaptation of workers to the increasing need for autonomy and self-management, and have proposed a new concept of work behavior that endangers workers (self-endangering work behavior, SEWB)^{22–24}. The concept of SEWB combines several maladaptive coping styles that have so far been studied separately, such as extension of working hours, intensification of working hours, sickness presenteeism, faking, substance abuse to recuperate, substance abuse to perform, reduction of quality, and bypassing of safety standards^{22–24}. SEWB is a work style that is functional in achieving work goals and provides motivation and satisfaction to workers; however, this style poses a risk to workers' health and may have a negative effect on the workforce^{22–26}. A scale to measure SEWB was originally in German, and comprises a self-administered questionnaire consisting of 21 items on five subscales: "Intensification of working hours," "Prolongation/extension of working hours," "Refraining from recovery/leisure activities," "Working despite illness," and "Use of stimulating substances"^{22–24}. We have recently developed a Japanese translation of the SEWB scale (J-SEWB) and reported that it has satisfactory reliability and construct validity; we also demonstrated that J-SEWB scores are strongly related to flexible working time and longer working hours in a sample of 600 Japanese workers²⁷.

Similar to SEWB, workaholism and work engagement are well-known worker psychological/behavioral factors that lead to excessive work^{28–37}. Schaufeli *et al.*^{28, 29} defined workaholism as the tendency to work excessively hard (the behavioral dimension) and being obsessed with work (the cognitive dimension); the latter manifests in working compulsively. Workaholism originates from internal impulses, needs, or motivations, not from external factors such as monetary rewards, whereas SEWB arises from external factors such as results responsibility and self-management pressure²³. Work engagement is a positive, fulfilling, work-related state of mind that is characterized by vigor (high levels of energy and mental resilience while working), dedication (being strongly involved in one's work and experiencing a sense of significance and pride), and absorption (being fully concentrated and happily engrossed in one's work)^{30, 31}. SEWB is a specific observable behavior, whereas work engagement is a psychological state of mind characterized by enjoyment of work and production of positive results²⁶. It is generally believed that worker health and well-being are reduced by workaholism and increased by work engagement^{28–37}.

The purpose of the present study is, first, to examine if

flexible working time is associated with adverse health effects in Japanese employees in relation to work-related psychological/behavioral factors such as SEWB, workaholism, work engagement, and job stressors. Health status was evaluated by assessing burnout^{38, 39)} and perceived health⁴⁰⁾. Burnout is a work-related state of exhaustion that occurs among employees and is characterized by four core dimensions: extreme tiredness, reduced ability to regulate cognitive and emotional processes, and mental distancing^{38, 39)}. These characteristics are accompanied by depressed mood and by non-specific psychological and psychosomatic complaints^{38, 39)}. Perceived health is a subjective evaluation of health that is relative to the health goals set by a person³⁴⁾. This index is also used to predict life prognosis and disease outbreaks⁴⁰⁾. Job stressors were assessed based on the job demand–control model^{11, 41–44)}. Previous studies of the health effects of flexible work arrangements have been primarily conducted outside Japan and include the effects of both working time and place^{5–11, 15, 16)}. Considering the above-mentioned situation in Japan, it seems important to clarify the health effects of flexible working time in Japanese workers.

Another aim of the present study was to propose a causal model using path analysis to examine the overall relationships of burnout and perceived health with the above-mentioned psychological/behavioral factors. In this model, we predicted that burnout and poor health would be caused by SEWB and workaholism, as indicated in previous studies^{24–26, 28, 31–33)}, and that work engagement buffers such adverse consequences^{28, 31–33)}. We also attempted to examine the relationships between SEWB, workaholism, and work engagement using this model.

Participants and Methods

Data

The study data were drawn from our previous Internet survey. The study protocol for data collection and ethical issues was reported in our previous study, along with the sociodemographic characteristics of the participants²⁷⁾: the internet survey was outsourced to a research company (hamon Inc, Yokohama, Kanagawa, Japan). Of the 1,052,566 registered individuals, 4,057 full-time employees aged 20 to 64 years who worked 30 hours or more a week were randomly selected (2,399 men and 1,658 women). These respondents were asked to answer an online questionnaire which consisted of the J-SEWB scale and questions regarding sociodemographic variables from September 8th, 2021, adjusting the number of responses by age

group to be similar to the result of Labor Force Survey in Japan (2020)⁴⁵⁾. The survey was discontinued when the total number of answers reached 600; this sample size was the maximum that the research budget allowed, and exceeded the size (300 or more) that would give stable results in factor analysis⁴⁶⁾. Of 600 participants, 265, 117, 37, and 181 were engaged in office, technical, sales and other-type work, respectively. Similarly, 191 worked under a flexible working time system (variable 62, flextime 85, exemption/discretionary work 31, advanced professional type 2, and others 11); the remaining 401 worked under a fixed working time system. Among 191 participants on flexible working time, 61 (31.9%), 71 (24.1%), 20 (8.9%), and 67 (35.1%) were office, technical, sales and other-job workers, respectively; the proportion was significantly varied among the four job types ($\chi^2=18.14, p<0.001$). This study was conducted after approval by the International University of Health and Welfare Research Ethics Committee (21-Ig-13, May 19, 2021)²⁷⁾.

The data analyzed here comprise age, weekly working hours, and working time system (flexible or fixed), as well as responses to the following self-report questionnaires: the Burnout Assessment Tool (BAT)³⁹⁾ to assess burnout, self-rated perceived health⁴⁰⁾, the J-SEWB scale²⁷⁾, the Dutch Workaholism Scale (DUWAS)²⁹⁾ to assess workaholism, the Utrecht Work Engagement Scale (UWES)³⁰⁾ to assess work engagement, and the Brief Job Stress Questionnaire (BJSQ)⁴⁴⁾ to assess job stressors. These measures are briefly described below.

BAT. To assess the four core dimensions of burnout described above, Maslach *et al.* developed the Burnout Assessment Tool (BAT)³⁸⁾. A Japanese version of the BAT has been developed and validated by Sakakibara *et al.*³⁹⁾. We obtained the Japanese short version from the Internet⁴⁵⁾ and used it to assess the four symptoms of burnout: exhaustion (Exhaustion), mental distance (M-D), cognitive impairment (C-I), and emotional impairment (E-I) (3 items each).

Perceived health. We used the following question to assess perceived health: “How good is your health?” Responses were on the following scale: “very good,” “good,” “moderate,” “poor,” and “very poor”⁴⁰⁾.

J-SEWB scale. This scale contains the subscales: “Intensification of working hours (IW),” “Prolongation/extension of working hours (PW),” “Refraining from recovery/leisure activities (RR),” “Working despite illness (WI),” and “Use of stimulating substances (US)”²⁷⁾; these contain 3, 4, 6, 5, and 3 items, respectively. All items are scored on a five-point Likert scale that ranges from 1 (“rarely/never”) to 5 (“very often”). Respondents were asked to report the fre-

quencies of various behaviors, such as working despite illness. The average scores on each subscale were summed to produce a total SEWB score. The process of the translation and validation of the J-SEWB scale to produce 21 items has been previously described²⁷⁾.

DUWAS. The DUWAS was developed by Schaufeli *et al.*^{28, 29)} and consists of two subscales: “Working Excessively Hard” (WE) and “Working Compulsively” (WC) (5 items for each). The Japanese version of the DUWAS obtained online⁴⁷⁾. The reliability and validity of the DUWAS have been reported previously²³⁾.

UWES. We used the UWES developed by Shimazu *et al.*³⁰⁾ which consists of 17 items on three subscales: vigor (6 items), dedication (5 items), and absorption (6 items). There is also a short 9-item version of the scale that comprises three subscales of 3 items each. In the present study, we used the Japanese translation of the short version, which was obtained online⁴⁵⁾. The reliability and validity of this scale have been previously reported³⁰⁾.

BJSQ. Developed in Japan for use in occupational health checkups, the BJSQ assesses job stressors and stress responses⁴⁴⁾. We used part of the BJSQ to assess the following job stressors: quantitative job demand (Quantity), qualitative job demand (Quality), and low job decision latitude (Low control) (3 items for each). The BJSQ scales have acceptable levels of internal consistency, reliability, and factor-based validity⁴⁴⁾.

Statistical Analysis

Because the data for age, weekly working hours, and perceived health were ordinal, their relationships to working time system (flexible or fixed) and to psychological/behavioral scale scores were examined using trend analysis, namely, the Mantel–Haenszel test and Jonckheere–Terpstra test, respectively. Differences in psychological/behavioral scale scores between flexible and fixed working time systems and job types were assessed using t-test and analysis of variance.

Correlation coefficients between psychological/behavioral scale scores, age, weekly working hours, and perceived health were calculated. The score ranges for these three ordinal scales were 1 (20–29 yr) to 5 (≥ 60 yr) for age, 1 (30–39 h) to 4 (≥ 60 h) for weekly working hours, and 1 (“very good”) to 5 (“very poor”) for perceived health. Multiple regression analysis was performed using BAT or perceived health scores as dependent variables and scores on SEWB, DUWAS, UWES, BJSQ, age, and weekly working hours as independent variables. Using the results of the multiple regression analysis, we created a causal model us-

ing path analysis to examine the overall relationships of burnout and perceived health to the psychological/behavioral factors examined here.

We used IBM SPSS version 26.0 and AMOS version 26.0 for statistical analyses.

Results

Table 1 shows the relationships between working time system (flexible vs fixed) and age, weekly working hours, and perceived health for 600 participants. The results indicated that the proportion of flexible working time significantly increased as weekly working hours increased. Table 2 shows the differences in psychological/behavioral scale scores (BAT, SEWB, DUWAS, UWES, and BJSQ) between flexible and fixed working time systems. All scores, except BJSQ and Low control, were higher in participants with flexible working time; differences were statistically significant for the BAT Exhaustion subscale, the four SEWB subscales (IW, PW, RR, and US), the total SEWB score, the total and all subscale scores of the DUWAS and UWES, and the BJSQ Quantity and Quality subscales. The two-way analysis of variance showed the significant effects of working time system (flexible vs fixed) on BAT scores. The one-way analysis of variance indicated that BAT scores were not significantly varied among the job types ($F=0.651$, $p>0.05$).

Table 3 shows the relationships of scale scores to age, weekly working hours, and perceived health. The trend analysis showed that as age increased, BAT and Low control (BJSQ) scores significantly decreased, whereas total UWES scores significantly increased. Similarly, as weekly working hours increased, the total SEWB, total DUWAS, and Quantity and Quality (BJSQ) scores significantly increased. Scores on all psychological/behavioral scales, except Quality (BJSQ), significantly changed as perceived health scores decreased. Perceived health was not significantly varied among the four job types ($\chi^2=9.88$, $p>0.05$).

Table 4 shows the correlations between scores on perceived health, psychological/behavioral scales, age, and weekly working hours. BAT and perceived health scores were significantly and negatively correlated with UWES scores, and positively correlated with scores on the other psychological/behavioral scale scores.

Table 5 shows the results of the multiple regression analysis. In both the forced entry and stepwise models, BAT scores were significantly and positively related to SEWB, DUWAS, and Low control scores, and negatively related to UWES scores. Similarly, perceived health scores were sig-

Table 1. Relationships of working-time system (flexible or fixed) to age, weekly working hours, and perceived health in 600 participants: Mantel–Haenszel test for trend

	Flexible (n=191)		Fixed (n=409)		χ^2 value (<i>p</i>)
	n	% ^a	n	% ^b	
Age (yr)					2.647 (0.104)
20–29	33	30.9	73	69.1	
30–39	34	27.6	91	72.4	
40–49	51	31.1	115	68.9	
50–59	49	31.7	98	68.3	
≥60	24	46.3	32	53.7	
Working hours					7.675 (0.006)
30–39	54	27.4	143	72.6	
40–49	98	30.8	220	69.2	
50–59	26	46.4	30	53.6	
≥60	13	44.8	16	55.2	
Perceived health					0.527 (0.468)
very good	38	34.9	71	65.1	
good	46	26.3	129	73.7	
moderate	78	32.6	161	67.4	
poor	24	38.1	39	61.9	
very poor	5	35.7	9	64.3	

^a n=191, 100%; ^b n=409, 100%

nificantly and positively related to SEWB and age scores, and negatively related to UWES scores.

Fig. 1 shows the model for the causal relationships for burnout (BAT scores) and for poor health (perceived health scores). The path analysis model that demonstrated the best fit to the data indicated that workaholism (DUWAS scores) had a significantly positive relation to burnout directly and via SEWB. Work engagement (UWES scores) had a significantly negative relation to burnout, whereas the relation via SEWB was not statistically significant. Additionally, Low control (BJSQ) was significantly and positively related to burnout. This model was able to explain 38.9% of the variance in burnout. However, the model for poor health explained a small portion (9%) of the variance in poor health. In this model, poor health was significantly related, only via SEWB, to workaholism, and negatively related to work engagement with no mediation by SEWB. Addition-

ally, age had a significant and positive relation to poor health.

Discussion

The flexible working time system was associated with an increase in working hours in the present study. Under the flexible working time system, employees' scores on the BAT (Exhaustion subscale), SEWB, DUWAS, and UWES, and the quantity and quality of work demand (Quantity and Quality scores of BJSQ) were significantly higher than in those under the fixed working time system. The two-way analysis of variance showed that working time system had a significant effect on BAT scores. These results suggest that flexible working time is associated with adverse work-related consequences, greater burnout, more working hours, SEWB, workaholism, and more job demands, as

Table 2. Differences in BAT, SEWB, DUWAS, UWES, and BJSQ scores between participants with flexible and fixed working-time systems: *t*-test

	Flexible (n=191)				Fixed (n=409)				t-value	p
	mean	SD	min	max	mean	SD	min	max		
BAT ^a										
Exhaustion	8.7	2.8	3	15	8.2	2.9	3	15	2.320	0.021
M-D	7.7	2.8	3	15	7.3	2.7	3	15	1.707	0.088
C-I	7.4	2.7	3	15	7.1	2.6	3	15	1.439	0.151
E-I	7.0	3.0	3	15	6.7	2.7	3	15	1.027	0.305
Total	30.8	9.8	12	60	29.2	9.6	12	60	1.872	0.062
SEWB										
IW	7.6	2.9	3	15	6.8	2.9	3	15	2.990	0.003
PW	8.9	3.6	4	20	7.6	3.6	4	20	4.103	0.000
RR	12.5	5.2	6	27	10.6	4.9	6	30	4.319	0.000
WI	9.1	4.7	5	22	8.5	4.5	5	25	1.396	0.163
US	6.8	3.2	3	15	6.1	3.3	3	15	2.337	0.020
Total	10.9	3.6	5	20	9.7	3.8	5	25	3.730	0.000
DUWAS										
WE	10.0	3.5	5	20	9.1	3.3	5	20	3.266	0.001
WC	9.3	3.1	5	20	8.7	3.1	5	20	2.136	0.033
Total	19.3	6.1	10	40	17.8	6.1	10	40	2.895	0.004
UWES										
Vigor	10.0	4.3	3	21	9.1	4.1	3	21	2.520	0.012
Dedication	11.0	4.2	3	21	10.2	4.3	3	21	2.126	0.034
Absorption	10.5	4.3	3	21	9.3	4.4	3	21	3.180	0.002
Total	31.5	12.2	9	63	28.6	12.3	9	63	2.735	0.006
BJSQ										
Quantity	7.9	2.1	3	12	7.3	2.2	3	12	2.940	0.003
Quality	8.2	2.0	3	12	7.5	2.2	3	12	3.618	0.000
Low control	7.0	2.2	3	12	7.2	2.0	3	12	−1.081	0.281

^aBetween working time system and between subscale effects were significant: $F=10.618$ ($p<0.01$) and 33.608 ($p<0.001$), respectively, in the two-way analysis of variance.

Abbreviations: BAT, Burnout Assessment Tool; SEWB, self-endangering work behavior; DUWAS, Dutch Workaholism Scale; UWES, Utrecht Work Engagement Scale; BJSQ, Brief Job Stress Questionnaire; SD, standard deviation.

Table 3. Relationships of BAT, SEWB, DUWAS, UWES, and BJSQ scores to age, weekly working hours, and perceived health in 600 participants: Jonckheere–Terpstra (J-T) test for trend

	n	BAT		SEWB		DUWAS		UWES		BJSQ			
										Quantity		Quality	
		mean	SD	mean	SD	mean	SD	mean	SD	mean	SD	mean	SD
Age (yr)													
20–29	110	29.6	10.3	9.6	3.7	17.2	5.4	27	13.1	7.6	2.3	7.8	2.3
30–39	127	31	9.6	10	3.9	18.1	6.5	27.6	12	7.4	2.1	7.6	2.2
40–49	164	30.9	9.3	10.3	3.7	19	6.1	29.4	11.8	7.6	2.1	7.5	2.1
50–59	145	29.4	9.2	10.5	4	18.9	6.4	30.9	12.3	7.7	2.2	8.1	2
≥60	54	24.3	9.2	9.2	3.3	17	5.9	35.7	10.8	7	2	7.4	2.1
JT-values (p)		−0.277 (0.005)		0.877 (0.380)		1.163 (0.245)		4.341 (<0.000)		−0.474 (0.636)		0.226 (0.821)	
Working hours													
30–39	205	29.6	9.7	9.6	3.8	17.9	6.4	29.6	11.2	7	2.2	7.3	2.3
40–49	313	29.9	10	9.9	3.7	18.1	5.8	29.5	12.6	7.6	2.1	7.8	2.1
50–59	62	29.2	8.2	11.3	3.6	19.4	6	28.7	13.9	8.5	1.8	8.2	1.8
≥60	20	30.3	7.8	13.5	4.2	21.8	7.8	32.7	13.6	8.6	2.3	8.8	2.1
JT-values (p)		1.240 (0.215)		5.376 (<0.000)		2.760 (0.006)		−0.230 (0.818)		5.809 (<0.000)		4.262 (<0.000)	
Perceived health													
very good	109	25.9	10.1	9.4	4.3	17.9	6.5	34.2	13.7	7.2	2.4	7.5	2.4
good	175	29.1	8.1	10	3.4	18.1	5.5	29.9	11.3	7.7	1.9	7.8	2.1
moderate	239	29.6	9.3	9.5	3.4	17.6	5.9	27.8	11.6	7.3	2.1	7.4	2
poor	63	35.8	9.6	12.6	4.1	20.9	6.7	28.3	12.9	8.3	2.3	8.3	2.1
very poor	14	41.7	10.8	13.9	3.4	23.9	6.1	24.5	14.6	9.2	1.6	9.6	1.7
JT-values (p)		6.514 (<0.000)		4.394 (<0.000)		2.472 (0.013)		−4.334 (<0.000)		2.043 (0.041)		1.713 (0.087)	
						2.472 (0.013)						2.480 (0.013)	

Total scores are shown for BAT, SEWB, DUWAS, and UWES. Abbreviations as in Table 2.

Table 4. Correlation coefficients between scores on age, weekly working hours, perceived health, BAT, SEWB, DUWAS, UWES, and BJSQ in 600 participants

	Age	Working hours	Perceived health	BAT	SEWB	DUWAS	UWES	BJSQ		
								Quantity	Quality	Low control
Age	#	0.011	0.071	−0.112**	0.024	0.042	0.184*	−0.015	0.012	−0.130**
Working hours	0.011	#	−0.011	0.041	0.247**	0.147**	0.007	0.249**	0.166**	0.000
Perceived health	0.071	−0.011	#	0.289**	0.191**	0.121**	−0.178**	0.109**	0.092*	0.094 *
BAT	−0.112**	0.041	0.289**	#	0.505**	0.430**	−0.202**	0.330**	0.263**	0.248**
SEWB	0.024	0.247**	0.191**	0.505**	#	0.568**	0.085	0.483**	0.430**	0.051
DUWAS	0.042	0.147**	0.121**	0.430**	0.568**	#	0.256**	0.590**	0.529**	0.018
UWES	0.184**	0.007	−0.178**	−0.202**	0.085	0.256**	#	0.134**	0.206**	−0.324**
Quantity	−0.015	0.249**	0.109**	0.330**	0.483**	0.590**	0.134**	#	0.757**	−0.012
Quality	0.012	0.166**	0.092*	0.263**	0.430**	0.529**	0.206**	0.757**	#	−0.073
Low control	−0.130**	0.000	0.094*	0.248**	0.051	0.018	−0.324**	−0.012	−0.073	#

* $p < 0.05$, ** $p < 0.01$.

Age, weekly working hours and perceived health were scored as described in Subjects and Methods; total scores are shown for BAT, SEWB, DUWAS, and UWES. See Subjects and Methods for abbreviations.

Table 5. Relationships of BAT and perceived health scores to scores on SEWB, DUWAS, UWES, BJSQ (Quantity, Quality, and Low control), age, and weekly working hours in 600 participants: multiple regression analysis

	Forced entry method				Stepwise method ^a			
	BAT		Perceived health		BAT		Perceived health	
Independent variables	β	p	β	p	β	p	β	p
SEWB	0.359	0.000	0.153	0.002	0.352	<0.001	0.206	<0.001
DUWAS	0.269	<0.001	0.066	0.229	0.295	<0.001	-	-
UWES	−0.255	<0.001	−0.228	<0.001	−0.262	<0.001	−0.216	<0.001
Quantity	0.045	0.392	0.002	0.971	-	-	-	-
Quality	0.011	0.830	0.039	0.524	-	-	-	-
Low control	0.134	<0.001	0.030	0.473	0.139	<0.001	-	-
Age	−0.060	0.065	0.118	0.003	-	-	0.113	0.005
Working hours	−0.096	0.004	0.054	0.705	-	-	-	-
R ²	0.398		0.081		0.388		0.082	
F-value	50.415		7.603		95.942		18.881	
p	<0.001		<0.001		<0.001		<0.001	

^aIndependent variables were entered to and removed from the regression equation at $p < 0.05$.

β = standardized partial regression coefficient. R = adjusted multiple regression coefficient.

Age, weekly working hours, and perceived health were scored as described in Participants and Methods; total scores were used for BAT, SEWB, DUWAS, and UWES. Abbreviations as in Table 2.

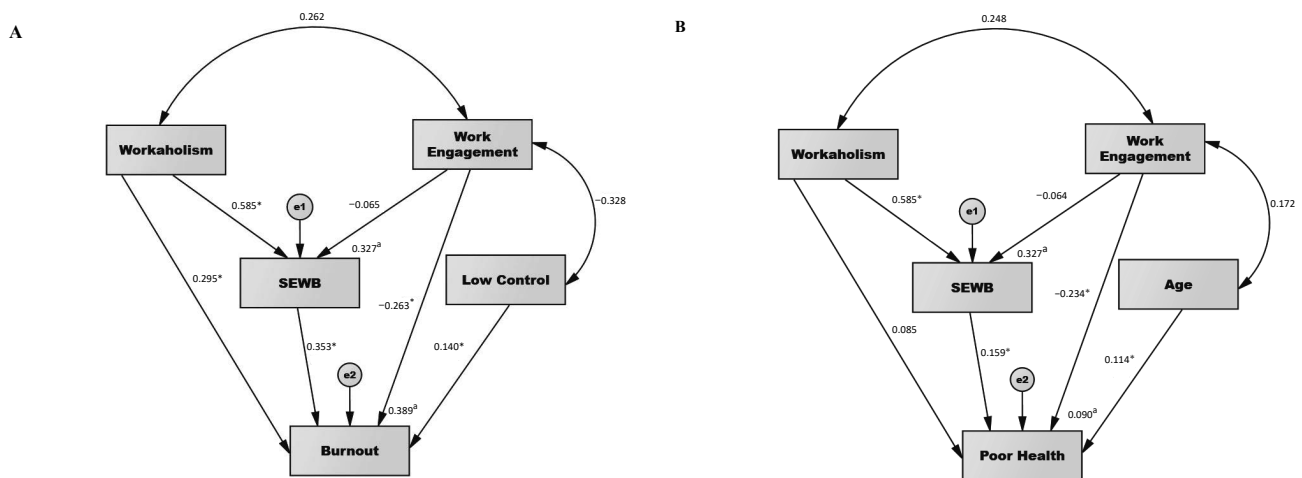


Fig. 1. Path analysis model for the relationships of burnout (BAT) (A) and poor health (perceived health) (B) to SEWB, workaholism (DUWAS), work engagement (UWES), and Low control (BJSQ) or age. Total scores were used for BAT, SEWB, DUWAS, and UWES. * $p < 0.001$. ^a Squared multiple regression coefficient.

Goodness of fit:

Burnout: GFI, AGFI, CFI, and RMSEA = 1.000, 0.997, 1.000, and 0.000, respectively.

Poor health: GFI, AGFI, CFI, and RMSEA = 0.999, 0.993, 1.000, and 0.000, respectively.

GFI, goodness of fit index; AGFI, adjusted goodness-of-fit index; CFI, comparative fit index; RMSEA, root mean square error of approximation; BAT, Burnout Assessment Tool; SEWB, self-endangering work behavior; DUWAS, Dutch Workaholism Scale; UWES, Utrecht Work Engagement Scale; BJSQ, Brief Job Stress Questionnaire.

well as being associated with positive factors such as improvement of work engagement. This indicates that our sample was dominated by company/employer-controlled flexible working time systems rather than by employee-oriented flexible working time systems. Although the proportion of participants on flexible working time was significantly varied among the job types, no significant relationships of the job types to BAT scores and perceived health were found in the present study. A further study is necessary to examine the effects of job content and titles in detail on the observation in the present study.

The multiple regression analysis demonstrated that BAT scores were positively related to SEWB, DUWAS, and Low control (BJSQ) scores and negatively related to DUWAS scores. They also showed a small negative relation to working hours, indicating that burnout was increased by SEWB, workaholism, low job decision latitude, and was decreased by work engagement. Similarly, the multiple regression analysis indicated that poor perceived health was associated with SEWB and aging, but was improved by work engagement. The path analysis model suggested that the effects of workaholism on burnout were either direct or via SEWB, whereas the effects of work engagement and low job decision latitude (Low control scores) were almost direct. Similarly, the model produced by the path analysis, although showing only a small effect, indicated that poor

health may be caused by age and by workaholism via SEWB, and prevented by work engagement.

Flexible working time may be associated with increased impairments in health and well-being if the flexibility is company controlled¹⁶. In line with this observation, flexible working time was associated with burnout and longer working hours in the present study. Among the psychological/behavioral factors associated with flexible working time in the present study, the path analysis indicated that SEWB caused burnout and poor perceived health. This is in accord with findings by Eder & Meuer²⁶ that SEWB reduces workers' ability to refuse when asked to fill in or to do work overtime, and that this is an important antecedent of burnout in nurses, and findings by Baeriswyl *et al.*²⁵ that sickness presenteeism (an aspect of SEWB) is associated with burnout and somatic complaints in teachers.

The present findings indicate that workaholism caused burnout and poor perceived health, in line with previous observations of its adverse health effects on workers^{28, 29, 31–35, 37}. These adverse effects of workaholism were caused via SEWB, in contrast to the findings of Shimazu *et al.*³² that workaholism was associated with better health through active coping (e.g., "I try to analyze the causes and solve the problem"). Thus, SEWB seems to be a maladaptive behavior caused by workaholism and to lead to adverse health effects in workers. It remains to examine which of the five

aspects of SEWB are most relevant to the health effects. Shimazu *et al.*³²⁾ also reported that workaholism was associated with poor health through emotional discharge (emotional expression involving others; for example, “I blame the person who has caused the situation”). The direct effects of workaholism on burnout found in the present study may include indirect effects of workaholism through emotional discharge. The mechanism underlying these effects should be further investigated. By contrast, work engagement reduced the adverse effects of workaholism and SEWB in the present study, in line with previous observations of its health protection effects^{28, 31–33)}. Work engagement thus may have mitigated the adverse effects of flexible working time, but it seemed insufficient to cancel such effects in our participants. Because work engagement was related to burnout and perceived health directly, not via SEWB, this suggests that promotion of work engagement is important to prevent ill health in workers.

In Japan, exempt employees work longer hours than those on fixed working time¹⁹⁾. The observation of longer working hours and higher job demands in participants with flexible working time in the present study probably reflects this situation in Japanese employees. Additionally, the observation that there were no significant differences in Low control scores (low job decision latitude) between participants with flexible and fixed time work could be interpreted within the cultural context of Japan, as described above²¹⁾; that is, regardless of whether they are on flexible or fixed working time, employees have little discretionary power. The results of the multiple regression analysis and the path analysis suggested that low job decision latitude is possibly more important than quantitative and qualitative job demands for burnout in Japanese workers, whereas Baeriswyl *et al.*²⁵⁾ reported that quantitative job demand leads to burnout both directly and through SEWB in teachers. This discrepancy may reflect job differences between participants, but it remains to be confirmed.

Therefore, the present findings suggest that flexible working time is associated with adverse work-related consequences and factors such as increased burnout, long working hours, SEWB, workaholism, and high job demands, as well as with positive factors such as improvement in work engagement. The findings indicate that SEWB is caused by workaholism, and plays a key role in the adverse health effects associated with flexible working time. As the present study used a cross-sectional design and the sample was relatively small, further research is needed to elucidate the long-term consequences of flexible working time in relation to job content and titles as well as work-

ing time arrangement types with a larger number of participants; consideration for possible confounding factors such as gender and performance/achievement-based evaluation system in company also will be necessary. Since working hours were considered by class in the present study, it would be necessary to conduct a study using actual working hours. Additionally, to take advantage of flexible working time, it is important to improve SEWB, workaholism, and low job decision latitude, and to develop work engagement in the workplace. Mediation awareness training can reduce workaholism⁴⁸⁾; therefore, effective measures to reduce workaholism and SEWB in workers should be developed. To improve work engagement and low decision latitude in employees, a better organizational approach in the workplace is needed.

Conclusions

Flexible working time is associated with adverse work-related consequences and factors such as increased burnout, long working hours, SEWB, workaholism, and high job demands, as well as with positive factors such as improvement in work engagement. SEWB is driven by workaholism and plays a key role in the adverse health effects of flexible working time. To take advantage of flexible working, it is important to improve workaholism, SEWB, and low decision latitude, and to develop work engagement in the workplace.

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