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Original Article

Relationship Between Job Training and Subjective Well-being In Accordance With Work Creativity, Task Variety, and Occupation



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ABSTRACT

Background: Job training influences the overall working environment and worker's well-being. The purpose of this study is to find the relationship between job training and subjective well-being in accordance with occupations and understand the influence of task characteristics—work creativity and task variety (WCTV)—on the effect of training.

Methods: A cross-sectional study based on the Fifth Korean Working Conditions Survey was conducted on 50,205 workers in the Republic of Korea. The World Health Organization–5 well-being index was used to measure their subjective well-being. The relationship between job training and subjective well-being was divided in accordance with the level of WCTV.

Results: Training paid for by employer showed a negative effect on subjective well-being when received for more than 3 days (OR 0.88, $p < 0.01$) in the last 12 months. Training paid for by oneself showed a positive linkage with well-being when the level of training was 1–3 days (Odds ratio = 1.55, $p < 0.001$). This result showed different aspects in accordance with the level of WCTV. For the high WCTV group, the aforementioned results were reaffirmed, but for the group with low WCTV, job training did not show a statistically significant result on well-being. On-the-job training was not related to subjective well-being regardless of the level of WCTV.

Conclusion: Job training had different effects on subjective well-being depending on the type and frequency of training, as well as the WCTV. It is imperative to comprehensively apply different types of job training in accordance with the characteristics of occupations to uplift workers' well-being.

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1. Introduction

Training can be defined as a planned learning experience designed to bring about a permanent change in an individual's knowledge, attitudes, or skills [1]. The proportion of workers who received training paid for by their employer (TPE) or paid by oneself (TPO) rose from 26% in 2005 to 38% in 2015 in Europe, and 34% of all workers in Europe have participated in on-the-job training (OJT) [2]. Furthermore, 42% of workers who received training paid for or provided by their employer strongly agree that training helped improve the way they work. Moreover, 29% strongly agree that their prospects for future employment are better because of

the training [2]. Hence, there is a need to take notice of the effect of job training on the overall job environment and the life of workers.

Previous studies signify that effective training can yield higher job satisfaction and productivity, improved work quality, increased motivation and commitment, higher morale and teamwork, and fewer mistakes [3,4]. Training is a factor that related to the overall environment and satisfaction of a worker's job. According to previous studies [5–7], which showed that the level of job satisfaction in the job environment has effects on well-being, it can be inferred that job training can be related to subjective well-being of an individual. However, research on the effects of training on the subjective well-being of workers is hard to find. Unlike TPO, where one feels the need and participates voluntarily, TPE can exclude the

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spontaneity of trainees. Still, it is hard to find research on the effects of job training on workers' subjective well-being by dividing them into TPO and TPE. From the previous research, which showed that the motivation of the trainee influence on the effectiveness of the training [8,9], we can assume that TPO and TPE will have different effects on subjective well-being. Because informal training at work showed a positive impact on job satisfaction [10], OJT can be expected to have a positive effect on subjective well-being.

Although there were many studies about the effects of individual (cognitive ability, self-efficacy) and organizational (organizational climate, supervisory support) factors on training impact, only a few studies focused on task characteristics. Wielenga-Meijer [11] showed that task characteristics (job demand, autonomy) had strong evidence for a positive relationship with learning consequences in terms of acquisition and automatization of skills and knowledge [11]. Hence, it is possible to think that the relationship between job training and subjective well-being could differ according to task characteristics, such as work creativity and task variety (WCTV), and that groups with higher levels should exhibit higher subjective well-being. The overview report of the 6th European Working Conditions Survey (EWCS) highlighted that the level of WCTV differs according to occupations. Lowest levels of WCTV were reported by workers in elementary occupations and plant and machine operators [2].

The aim of this study was to examine the relationship between job training and subjective well-being by the type and frequency of training and to know the influence of task characteristics (WCTV) and occupation on the effect of training.

2. Materials and methods

2.1. Participants

The data used in this study were collected from the 5th Korean Working Conditions Survey (KWCS) carried out in 2017. The sampling method of this study followed the report of the user guide for the 5th KWCS [12]. The target population of the KWCS was the economically active population aged 15 or more. This survey was representative data of the employed workforce in the Republic of Korea with a response rate of 0.449. In the analysis related to TPE, most of the self-employed and employers were excluded, but 133 self-employed of 14,459 and 16 employer of 3,256 who get paid a salary or a wage by an agency were included (e.g., work as freelancer, work through subcontract). About TPO, OJT and other variables, all samples were used for analysis except for missing values. Accordingly, samples analyzed in this study consisted of 50,205 workers—23,707 men and 26,498 women. However, because of the missing values for each question, the numbers of samples contained in each analysis were not completely the same. All KWCS participants provided informed consent for voluntary participation, and because the KWCS elicited open-source data with anonymity and secured privacy rights of the participants, this study was not applicable for an Internal Review Board (IRB).

2.2. Measurement

2.2.1. Measurement of subjective well-being

The questionnaires about subjective well-being consisted of the 5-item World Health Organization Well-Being Index (WHO-5 well-being index). The WHO-5 items were as follows: How you have been feeling over the last two weeks, (a) "I have felt cheerful and in good spirits," (b) "I have felt calm and relaxed," (c) "I have felt active and vigorous," (d) "I woke up feeling fresh and rested," and (e) "My daily life has been filled with things that interest me" [13]. Each of the 5 items was curated by a 6-point Likert scale, scored from 1 (all

the time) to 6 (none of the time) in this survey. This scale was a measure of health in relation to the quality of life; therefore, the raw score was transformed to a score 0 (absence of well-being) to 100 points (maximal well-being) in this study (Cronbach alpha = 0.925 in this study). Afterward, more than 50 points signified a high subjective well-being group, and fewer than 50 points signified a low subjective well-being group. This metric was based on previous studies recommending using 50 points as a threshold for a poor subjective well-being [14–16]. The overall average score in this study was 57.09, and 69.4 percent of men and 67.8 percent of women belonged to the high subjective well-being group.

2.2.2. Measurement of WCTV

The definition of WCTV variables was based on the EWCS overview report [2]. In the report, the following six factors related to task characteristics and situations were selected to constitute the WCTV in terms of the cognitive demand of the task: (a) non-monotonous tasks, (b) nonrepetitive tasks, (c) complex tasks, (d) learning new things, (e) applying own ideas, and (f) solving unforeseen problems. Among them, only the "applying their own ideas" question consisted of a 5-point Likert scale. Therefore, after making this a dichotomous scale ("Always" and "Most of the times" was converted to 1, "Sometimes," "Rarely," and "Never" was converted to 0), all six factors were combined to create WCTV variable from 0–6 points (Cronbach alpha = 0.481 in this study). Consecutively, 0–3 points were coded as low WCTV group and 4–6 as high WCTV group.

2.2.3. Measurement of job training

Questionnaires related to job training in this study include questions about the experience in the last 12 months in (a) TPE, (b) TPO, and (c) OJT. Provided that relevant experience existed, a 6-point scale question was presented asking how many days they had been trained in the past 12 months (1 = under 1 day, 2 = 2–3 days, 3 = 4–5 days, 4 = 6–9 days, 5 = 10–19 days, 6 = over 19 days). To check the influence of the levels of training, TPE and TPO were coded to 0 if there was no training experience, coded to 1 if the training days were 1–3 days, and coded to 2 if the training days were 4 or more days in the past 12 months. For OJT, the training was coded 1 if there was training experience in the past 12 months and 0 if there was none.

2.2.4. Measurement of other variables

This study included the sociodemographic characteristics of workers besides job training, subjective well-being, and WCTV. Occupations were classified to managers, professionals and related workers, clerks, service workers, sale workers, skilled agricultural, forestry and fishery workers, craft and related trades workers, plant, machine operators and assemblers, and elementary occupations in accordance with Korean Standard Classification of Occupations. In addition, the subjective health condition of workers was evaluated by the five response options for the question "How is your health in general?": very good, good, fair, bad, very bad. Subjective health condition was classified into 3 groups: high (very good, good), medium (fair), low (bad, very bad). Employment status was categorized into employer, employee, self-employed, and unpaid family workers. Unpaid family workers were family members or relatives of self-employed people who were not paid and engage in more than one-third of their regular working hours.

2.3. Statistics analysis

First, Pearson's Chi-square test and linear-by-linear association test for trend were used to investigate associations between subjective well-being, WCTV, and other variables. Second, to identify if

the ratio of the high well-being group, in accordance with occupations, varies based on the levels and types of job training, a Chi-square test was conducted. In the case of TPO and TPE, where training levels were classified into three groups (0 = none, 1 = 1–3 days, 2 = more than 3 days), the Chi-square test was not only conducted throughout the all three groups, but also between the two groups. Third, the effect of job training and other variables on well-being was analyzed through multiple logistic regression and indicated the odds ratio (OR), 95% confidence interval, and *p*. In addition to the analysis of the entire sample, the sample was divided in accordance with the level of WCTV to examine the role of WCTV on training effectiveness. All statistical analyses were performed on IBM SPSS Statistics for Windows, Version 25 (IBM Corp).

3. Results

3.1. Distribution of variables in accordance with well-being degree

The distribution of variables divided by the subjective well-being level was shown in Table 1. All variables showed a

statistically significant difference in the Chi-square test, depending on the level of well-being, and the trend test also showed statistically significant results. TPE, TPO, and OJT were related to the subjective well-being level, and a group with training showed relatively higher well-being. The occupations also had a relationship with well-being; the professionals had relatively high well-being compared with those with the elementary occupations. Besides the status of employment was related to subjective well-being, employer and employee showed a relatively high rate of high well-being. Moreover, the level of the subjective health condition showed relationship with subjective well-being. The better the health, the higher the well-being (Table 1 here).

3.2. Distribution of variables according to the WCTV

Results showing the distribution of variables divided by the WCTV level were shown in Table 2. All variables showed a significant difference in the Chi-square test, depending on the level of WCTV, and the trend test also showed statistically significant results. TPE, TPO, and OJT showed a significant relationship with the

Table 1
Distribution of variables according to subjective well-being degree

Variables		Subjective well-being				Chi-square
		Low		High		
		N	%	N	%	
Sex	Female	8,527	32.2%	17,947	67.8%	15.26***
	Male	7,243	30.6%	16,437	69.4%	
Age	<40	2,972	23.0%	9,976	77.0%	1,414.78***
	40–49	3,269	27.7%	8,515	72.3%	
	50–59	4,155	31.4%	9,084	68.6%	
	≥60	5,374	44.1%	6,809	55.9%	
Educational level	Under high school	4,749	48.8%	4,981	51.2%	2,042.85***
	High school	6,095	31.8%	13,044	68.2%	
	Bachelor's degree	4,771	23.2%	15,819	76.8%	
	Masters or higher	141	21.9%	502	78.1%	
Numbers of employee	1	4,587	35.7%	8,258	64.3%	228.62***
	2–9	6,326	31.8%	13,559	68.2%	
	10–49	2,891	28.2%	7,361	71.8%	
	50–249	1,188	26.6%	3,277	73.4%	
	Over 250	660	27.2%	1,766	72.8%	
Employment status	Employer	857	26.4%	2,395	73.6%	541.54***
	Employee	8,582	28.5%	21,510	71.5%	
	Self-employed	5,258	36.4%	9,174	63.6%	
	Unpaid family worker	1,007	46.0%	1,180	54.0%	
Working hours per week	≤<40	7,510	31.0%	16,727	69.0%	85.34***
	41–52	3,816	29.2%	9,267	70.8%	
	⇒>53	4,369	34.4%	8,331	65.6%	
Working days per week	3 or lower	1,005	40.6%	1,472	59.4%	218.34***
	4–5	6,759	28.6%	16,859	71.4%	
	Over 5	7,937	33.2%	15,955	66.8%	
Subjective health	Low	1,766	66.4%	892	33.6%	3,771.09***
	Medium	6,431	44.5%	8,018	55.5%	
	High	7,569	22.9%	25,471	77.1%	
Training paid for or provided by employer	None	7,452	31.1%	16,534	68.9%	78.27***
	1–3 days	1,222	25.3%	3,607	74.7%	
	Over 3 days	1,023	27.1%	2,752	72.9%	
Training paid by oneself	None	15,210	31.7%	32,737	68.3%	43.54***
	1–3 days	340	24.4%	1,054	75.6%	
	Over 3 days	203	26.3%	570	73.7%	
On-the-job training	No	14,129	32.1%	29,900	67.9%	74.08***
	Yes	1,619	26.6%	4,462	73.4%	
Occupations	Managers	41	19.9%	165	80.1%	1,729.14***
	Professionals	1,676	22.8%	5,667	77.2%	
	Clerk	1,525	22.7%	5,191	77.3%	
	Services worker	2,261	30.5%	5,142	69.5%	
	Sales worker	2,647	28.1%	6,785	71.9%	
	Agricultural workers	2,590	51.1%	2,483	48.9%	
	Craft workers	1,386	31.8%	2,975	68.2%	
	Plant and machine operators	1,476	33.6%	2,918	66.4%	
	Elementary occupations	2,149	41.9%	2,984	58.1%	

p* < 0.05, *p* < 0.01, ****p* < 0.001 by trend test.

Table 2
Description of variables according to the level of work creativity and task variety

Variables		Work creativity and tasks variety				Chi-square
		Low		High		
		N	%	N	%	
Sex	Female	18,856	71.4%	7,546	28.6%	641.84***
	Male	14,354	60.7%	9,293	39.3%	
Age	<40	7,462	57.8%	5,459	42.2%	1,911.61***
	40–49	6,972	59.3%	4,783	40.7%	
	50–59	8,886	67.3%	4,322	32.7%	
	≥60	9,890	81.3%	2,275	18.7%	
Educational level	Under high school	8,280	85.2%	1,434	14.8%	4,309.49***
	High school	14,025	73.5%	5,061	26.5%	
	Bachelor's degree	10,694	52.0%	9,862	48.0%	
	Masters or higher	177	27.6%	465	72.4%	
Numbers of employee	1	9,304	72.6%	3,511	27.4%	1,259.33***
	2–9	14,020	70.7%	5,824	29.3%	
	10–49	6,108	59.7%	4,127	40.3%	
	50–249	2,424	54.3%	2,037	45.7%	
	Over 250	1,155	47.7%	1,268	52.3%	
Employment status	Employer	1,735	53.5%	1,511	46.5%	781.09***
	Employee	19,230	64.0%	10,798	36.0%	
	Self-employed	10,301	71.5%	4,107	28.5%	
	Unpaid family worker	1,824	83.8%	353	16.2%	
Working hours per week	=<40	15,887	65.7%	8,293	34.3%	31.75***
	41–52	8,550	65.5%	4,510	34.5%	
	=>53	8,662	68.4%	4,011	31.6%	
Working days per week	3 or lower	2,153	87.1%	319	12.9%	1,117.35***
	4–5	14,095	59.8%	9,472	40.2%	
	Over 5	16,824	70.6%	7,017	29.4%	
Subjective health	Low	2,194	82.5%	466	17.5%	1,075.11***
	Medium	10,720	74.4%	3,682	25.6%	
	High	20,292	61.5%	12,688	38.5%	
Training paid for or provided by employer	None	17,382	72.6%	6,554	27.4%	2,326.22***
	1–3 days	2,449	50.8%	2,374	49.2%	
	Over 3 days	1,399	37.2%	2,363	62.8%	
Training paid by oneself	None	32,426	67.8%	15,432	32.2%	1,016.57***
	1–3 days	553	39.8%	838	60.2%	
	Over 3 days	208	27.0%	562	73.0%	
On-the-job training	No	30,315	69.0%	13,640	31.0%	1,116.47***
	Yes	2,865	47.3%	3,189	52.7%	
Occupations	Managers	68	33.0%	138	67.0%	6,083.00***
	Professionals	2,872	39.2%	4,456	60.8%	
	Clerk	3,448	51.4%	3,254	48.6%	
	Services worker	5,409	73.3%	1,973	26.7%	
	Sales worker	7,037	74.8%	2,370	25.2%	
	Agricultural workers	4,163	82.1%	910	17.9%	
	Craft workers	2,312	53.1%	2,039	46.9%	
	Plant and machine operators	3,159	72.0%	1,231	28.0%	
	Elementary occupations	4,691	91.7%	427	8.3%	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ by trend test.

WCTV level, and a group with more training showed relatively higher WCTV. The occupations also had relationship with WCTV, and the professionals had a relatively high WCTV compared with the those in elementary occupations. In addition, the level of subjective health conditions was related to WCTV. The better the health, the higher the WCTV (Table 2 here).

3.3. Job training by occupations

Fig. 1 showed the ratio of high well-being groups in accordance with the types and levels of training, in accordance with occupations. Fig. 1(A) illustrated the ratio of high well-being in accordance with the level of TPE in accordance with occupations and the results of the Chi-square test. Entire sample, elementary occupations, craft workers, and clerks showed difference in the ratio of high well-being in accordance with the level of training. For example, those in elementary occupations ($p < 0.01$), craft workers ($p < 0.01$), and clerks ($p < 0.05$) showed higher ratio of the high subjective well-being group if they received 1–3 days of training than when not trained. Conversely, the ratio of the high well-being group was

lower in cases where clerks received more than 3 days of TPE than those where they received 1–3 days of training ($p < 0.05$).

Fig. 1(B) showed the ratio of the high well-being group in accordance with the level of TPO by occupations and the results of the Chi-square test. Entire samples, craft workers, services workers, clerks, and professionals showed differences in the ratio of high subjective well-being in accordance with the level of training. Whenever the craft workers ($p < 0.05$) and professionals ($p < 0.01$) received 1–3 days of training, and the sales workers ($p < 0.05$) received more than 3 days of training, they all showed a higher ratio of high well-being than cases where they were not trained. Contrariwise, the ratio of the high well-being group was lower in cases where the clerks ($p < 0.001$) received more than 3 days of training than when they did not train or receive 1–3 days of training, and when the professionals ($p < 0.05$) received TPO for more than 3 days than 1–3 days.

Fig. 1(C) showed the ratio of the high subjective well-being group in accordance with the OJT that were further categorized in terms of occupations, as well as the results of the Chi-square test. Entire samples, agricultural workers, craft workers, services workers, and plant and machine operators showed differences in

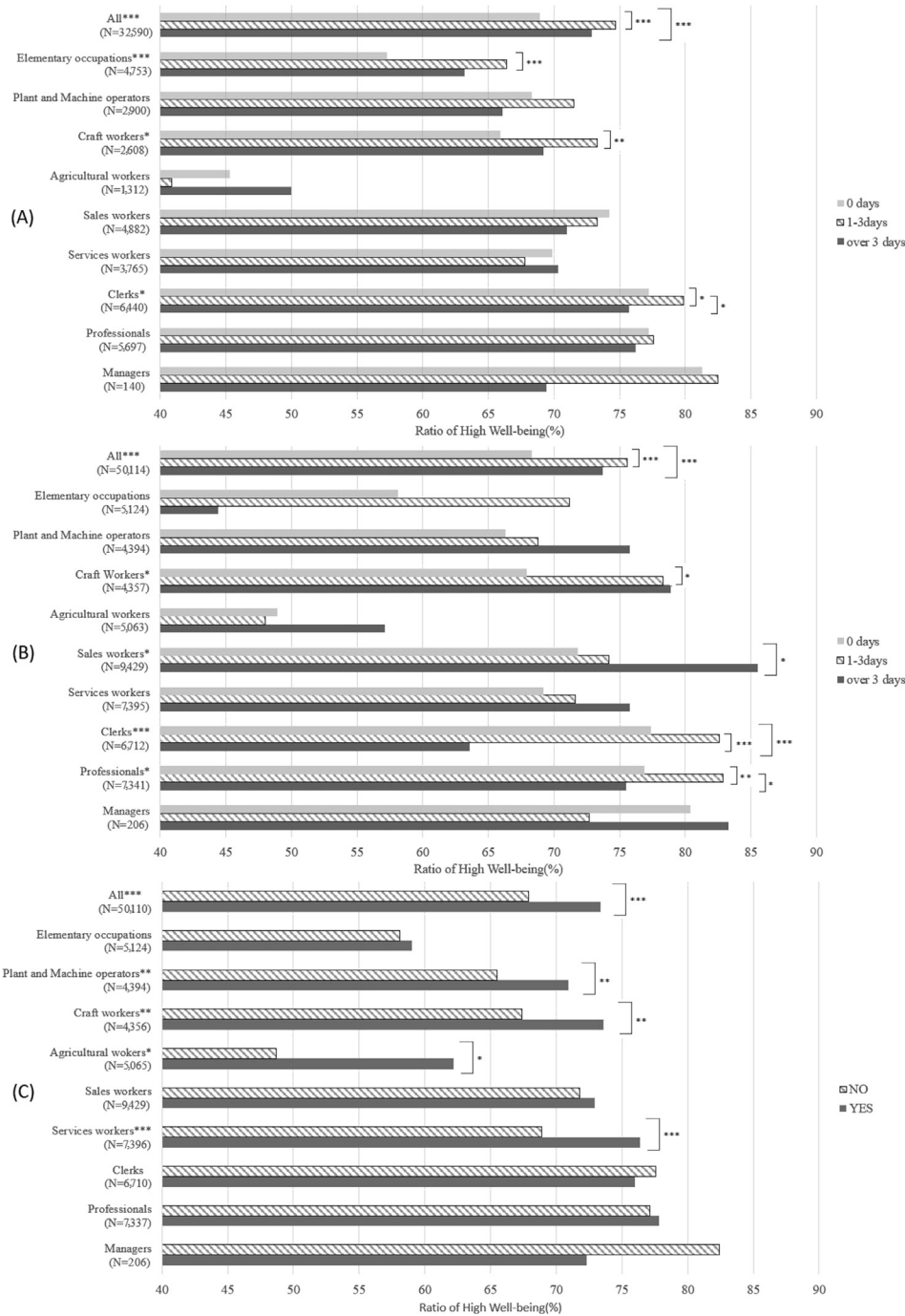


Fig. 1. The ratio of the high well-being group in accordance with the level of (A) trainin paid for or provided by the employer, (B) training provided by oneself, (C) on-the-job training by occupations. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Note: The results of the Chi-square test of the entire training level groups are shown next to the occupations on the left, and the results between the two groups are shown on the right side next to the bar graph.

the ratio of high well-being in accordance with OJT. All of them showed a higher ratio of high well-being group when they received OJT (Fig. 1 here).

3.4. Results of multiple logistic regression of subjective well-being

The results of the multiple logistic regression of the variables related to well-being were shown in Table 3. Based on the regression of the entire sample, in the case of TPE, well-being decreased when trained for more than 3 days (OR 0.88), and in the case of TPO, well-being was significantly increased when trained for 1–3 days

(OR 1.55). In addition, the results showed that subjective well-being increased when WCTV was high compared with low cases (OR 1.19). Besides, the well-being of men was lower than that of women (OR 0.94). For higher ages, well-being was lower than for those in their 30s or younger. As the level of education increased, so did subjective well-being. Well-being was low when workers labored more than 52 hours per week (OR 0.80), and a decrease was apparent when the number of working days per week was less than 4 days (OR = 0.88). Moreover, it showed higher well-being as the subjective health conditions increased.

Table 3

Results of multiple logistic regression analysis related to well-being by the level of work creativity and task variety. Odds ratio (95% confidence interval)

Covariates		All (N = 31,907)	Work creativity and task variety	
			Low (N = 20,788)	High (N = 11,119)
Sex	Female	1.00	1.00	1.00
	Male	0.94(0.89–0.99) *	0.91(0.85–0.97) **	0.98(0.89–1.08)
Age	<40	1.00	1.00	1.00
	40–49	0.88(0.82–0.94) ***	0.86(0.79–0.94) ***	0.91(0.81–1.01)
	50–59	0.91(0.85–0.98) *	0.84(0.77–0.92) ***	1.04(0.91–1.18)
	≥60	0.88(0.80–0.97) *	0.79(0.70–0.88) ***	1.25(1.01–1.55) *
Educational level	Under high school	1.00	1.00	1.00
	High school	1.30(1.19–1.42) ***	1.26(1.14–1.39) ***	1.38(1.09–1.75) **
	Bachelor's degree	1.64(1.49–1.82) ***	1.63(1.46–1.83) ***	1.63(1.28–2.08) ***
	Master's or higher	1.63(1.29–2.07) ***	1.56(1.03–2.38) *	1.73(1.22–2.45) **
Numbers of employee	1	1.00	1.00	1.00
	2–9	1.15(1.00–1.32)	1.15(0.99–1.34)	1.06(0.73–1.55)
	10–49	1.09(0.94–1.25)	1.04(0.89–1.22)	1.10(0.75–1.60)
	50–249	1.09(0.94–1.28)	1.11(0.93–1.32)	1.01(0.69–1.49)
	Over 250	0.99(0.84–1.18)	1.08(0.88–1.32)	0.87(0.59–1.30)
Employment status	Self-employed	1.00	1.00	1.00
	Employer	0.80(0.25–2.54)	0.19(0.02–2.46)	1.47(0.34–6.34)
	Employee	1.11(0.75–1.64)	0.83(0.49–1.39)	1.61(0.86–3.03)
	Unpaid family worker	0.90(0.60–1.34)	0.67(0.39–1.13)	1.32(0.67–2.59)
Working hours per week	41–52	1.00	1.00	1.00
	Under 41	1.05(0.98–1.12)	1.01(0.93–1.10)	1.14(1.01–1.29) *
	Over 52	0.80(0.73–0.86) ***	0.80(0.73–0.88) ***	0.77(0.66–0.90) ***
Working days per week	4–5	1.00	1.00	1.00
	Under 4	0.88(0.79–0.98) *	0.93(0.83–1.05)	0.60(0.44–0.82) **
	Over 5	1.02(0.95–1.10)	0.99(0.91–1.08)	1.10(0.96–1.28)
Subjective health	Low	1.00	1.00	1.00
	Medium	2.01(1.76–2.30) ***	1.88(1.62–2.17) ***	2.79(2.03–3.83) ***
	High	4.75(4.16–5.42) ***	4.21(3.63–4.87) ***	7.43(5.44–10.15) ***
On-the-job training	No	1.00	1.00	1.00
	Yes	1.01(0.94–1.09)	1.03(0.93–1.14)	0.98(0.88–1.10)
Training paid for or provided by employer	None	1.00	1.00	1.00
	1–3 days	1.01(0.93–1.09)	1.10(0.99–1.22)	0.89(0.78–1.01)
	Over 3 days	0.88(0.80–0.96) **	0.91(0.79–1.03)	0.85(0.74–0.96) *
Training paid by oneself	None	1.00	1.00	1.00
	1–3 days	1.55(1.28–1.89) ***	1.26(0.94–1.68)	1.86(1.42–2.43) ***
	Over 3 days	0.91(0.74–1.14)	0.95(0.63–1.43)	0.96(0.74–1.25)
Work creativity and task variety	Low	1.00		
	High	1.19(1.12–1.26) ***		
R ²	0.108	0.108	0.083	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Results of multiple logistic regression by dividing samples based on the level of WCTV showed different aspects between the two groups. For groups with low WCTV, job training had not effect on subjective well-being. On the contrary, the high WCTV group showed statistically significantly decreased well-being when they received TPE for more than 3 days (OR = 0.85) and showed increased well-being when they received TPO for 1–3 days (OR1.86). OJT did not show statistically significant result regardless of the level of WCTV.

Besides, while the high WCTV group showed higher well-being when they were in the 60s or older than in 30s or younger (OR = 1.25), the low WCTV group had decreasing well-being with increasing age. Notably, men showed lower subjective well-being only in the low WCTV group. The number of working days per week had only shown statistically significant results for the high WCTV group; well-being had decreased when the number of working days per week was less than 4 days. The two groups showed similar results when it came to subjective health and education levels (Table 3 here).

4. Discussion

The results of this study showed how the job training (OJT, TPE, and TPO) was linked with subjective well-being in accordance with the WCTV. Furthermore, the results specifically showed what type

and level of job training could improve or aggravate the well-being of workers according to their occupational groups. In addition, it showed the effect of gender, age, the education level, working hours and days per week, and the subjective health condition on well-being.

The results showed that the group with high levels of WCTV had higher well-being than those with low levels. This difference was similar to the results of a previous study, which showed that the more creative the organization was, the higher the well-being level in terms of happiness, enthusiasm, and optimism [17]. The findings were also coherent with the results of a previous study on the effects of psychosocial factors on depression, impaired psychological well-being, and alcoholism, which showed that monotonic work increased the risk of developing depression in men [18].

4.1. Relationship between job training and subjective well-being by occupations and WCTV

4.1.1. Job training effects on subjective well-being

In the Chi-square test, the subjective well-being was generally improved when receiving the TPE and TPO for 1–3 days, and when training for more than 3 days, well-being was reduced compared with other levels, except for sales workers. Nevertheless, the results of the multiple logistic regression indicated TPE and TPO had varying effects on well-being. Only the results of a decrease in well-

being when receiving TPE for more than 3 days and an increase in well-being when receiving TPO for 1–3 days were statistically significant. OJT showed positive linkage with subjective well-being in the Chi-square test but did not show a significant result in multiple logistic regression.

From previous studies, the above relationship between job training and subjective well-being could be explained through trainees' job performance. Pugh stated that a provision of training improve the professionalism of workers [19]; therefore, a deficiency of training could lead to a lack of skill to use the knowledge of individuals, which bring about a lack of self-satisfaction [20]. Accordingly, when the training has a direct positive impact on job performance of trainee, they could be more satisfied in their job [21]. Similarly, Wright and Bonett [22] showed a positive relationship between job performance and employee's well-being.

The differences between TPE and TPO signified the reducing effectiveness of TPE when trainees did not feel the need for training, whereas in TPO, trainees felt the need for capacity building and participated voluntarily at a cost. Therefore, this study looked at how the effectiveness of job training changed in accordance with how much the trainees assessed their technical level in Appendix A. TPO showed a positive linkage with subjective well-being regardless of the self-technical level assessment. Concerning TPE, if the trainees assessed their technical level as overskilled, well-being decreased when TPE was received for more than 3 days (OR 0.72, $p < 0.001$). However, when the trainees assessed their technical level as in need of further training (underskilled) or corresponded well with duties, TPE did not show a negative relationship on well-being. Therefore, unlike TPO, the reason for the TPE's negative relationship with subjective well-being might be that TPE had failed to fully reflect the needs of workers for training. If the TPE were to be implemented only for workers who assessed their technical levels as underskilled or correspond with duty, there might be no negative relationship between well-being and TPE.

Lim and Morris [23] showed that trainees' immediate training needs significantly influence their perceived results of learning, and Baumgartel et al. [24] showed that the perceived utility and value of training was related to the training outcome for managers. Previous studies also concur that the effectiveness of training can vary depending on the motivation of the trainee [25–27]. In addition, the difference between TPE and TPO in terms of quality and content may also be the reason for their different effects on well-being. Considering previous studies, the effectiveness of training can indeed vary depending on the quality and content of the training [8,9].

4.1.2. Job training effects by WCTV

In this study, the group with low WCTV showed that training did not have a statistically significant impact on well-being in regression analysis. However, in the high WCTV group, TPO showed a positive effect, and TPE showed a negative effect on subjective well-being. These results exemplify that the groups with low WCTV do relatively simple, repetitive, and familiar tasks compared with the high groups. However, the training itself does not have any meaning for the trainees. A prior study showed that there were negative relationships between task autonomy and skill variety with work-related boredom and also direct associations with intrinsic motivation [28].

The effects of training on subjective well-being, examined by a multiple logistic regression according to self-technical level assessment (needs of training) and WCTV (Appendix B), showed that even if the trainee's WCTV level was low, if a trainee assessed their technical level as overskilled, the well-being decreased when they received TPE for more than 3 days (OR 0.75, $p < 0.05$). Considering the results in Appendix A, TPE involved negative

meaning for the trainees who assessed their technical level as overskilled. In addition, even if the trainee's WCTV level was low, if a trainee assessed their technical level as in need of further training (underskilled), the well-being increased when they received TPO for 1–3 days (OR = 2.06, $p < 0.05$). Thus, TPO involved positive meaning for trainees who assessed their technical level as underskilled. Considering the results in Appendix B, which showed that job training has an effect on subjective well-being if training involved positive or negative meaning for the trainees even in a low WCTV group, the results that training had no effect in the low WCTV group in Table 3 implies that there were fewer trainees in the low WCTV group with these meaning due to their monotonous, repetitive task characteristics. In this sample, while 31.5 percent of the high WCTV group responded that job training had these meaning (positive or negative) for them, only 26 percent of the low WCTV group said so (data not shown).

4.1.3. Job training effects categorized by occupations

Results showed that the ratio of the high well-being group was different in accordance with job training further categorized in terms of occupations. This disparity was also reported by a prior study, which showed that the effectiveness of training varied by occupation [29]. Nonetheless, in Appendix C, which showed the effectiveness of the training through stepwise logistic regression for each occupation, results about the job training were different from the result examined by the Chi-square test. For example, in Fig. 1, the univariate analysis, the ratio of high well-being group did not show a statistically significant difference when the clerks received the OJT, whereas Appendix C by multiple logistic regression showed a decrease in well-being when receiving the OJT. This was seen as a result of the adjusting compounding factors. Among the clerks, compared with those who were not trained, workers who had undergone OJT showed a high proportion of the high WCTV level (60.1% vs. 45.9%), proportion of the bachelor or higher education level (88.0% vs. 82.0%), and high subjective health conditions (85.2% vs. 80.7%) in this sample (data not shown). Therefore, the reason why Fig. 1 showed that OJT did not have a negative effect on the well-being of clerks was might be because the clerks who received the OJT had a relatively higher level of education, WCTV, and subjective health conditions than the clerks who did not receive the OJT. Therefore, Appendix C, which adjusting these compounding factors, indicated that OJT had a negative relationship with well-being among the clerks.

4.2. Applications and recommendations

Based on the explanation so far, this study proposed a conceptual framework based on Hobfoll's "conservation of resources theory" [30] and Siegrist's "effort–reward imbalance model" [31,32] in Fig. 2. From the point of view of "conservation of resources theory", job training could be viewed as "resources investment (time, money)" for 'resources gain (knowledge, skill)'. By responding 'resources investment' and 'resources gain' to "effort–reward imbalance model", the reason for the increase or decrease in well-being by training can be explained by the imbalance between resource investment and gain. The reason why training for more than 3 days showed generally negative results than receiving 1–3 days also can be explained in terms of the excessive investment of resources. A previous study also showed similar results that excessive training could aggravate the job satisfaction of workers [33]. Fig. 2 also included the 'mismatch of needs for training' and 'motivation' that were thought to influence on the relationship between training and well-being in this study, showing how they contributed to the imbalance between effort and reward.

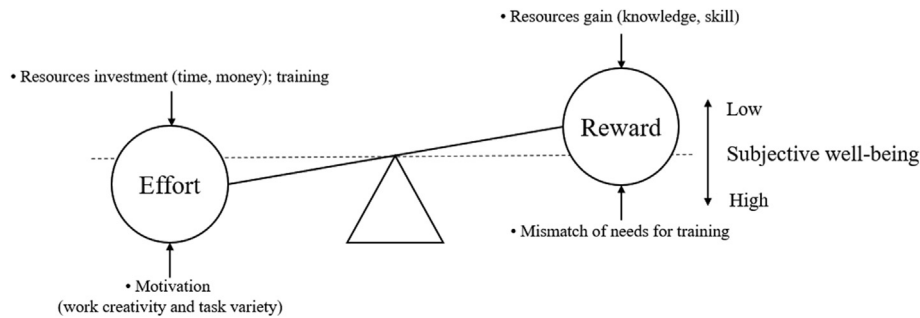


Fig. 2. The conceptual framework of relationship between job training and subjective well-being.

In previous studies, the positive effects of training tended to be highlighted, but through this study, we found that conducting job training could have a negative impact on the worker's well-being. This study also showed that the characteristics of work, especially about creativity and variety, also influence the effectiveness of training. Besides, as the results of this study were divided based on occupations, it became possible to know what kind of training had a positive effect on the well-being of the trainees, depending on their occupations and work characteristics, rather than conducting the same training regularly. Depending on the results of this study, it seems necessary to apply job training in detail in accordance with the characteristic of task, occupations, types of training, and needs of the trainees (Fig. 2 here).

4.3. Limitations

The first limitation of this study was the limits on the definition and measurement methods of the concepts used. We used the WHO-5 well-being index to show the subjective well-being of workers through self-response, which had limitations on whether the mental health of workers was reflected well in this study because of self-reported bias and uncertainty. However, a strength of this study was that national scale samples were collected by obtaining information about subjective well-being through a survey. In addition, according to previous studies, WHO-5 well-being index was suitable for evaluation of subjective well-being levels [16,34,35]. Second, WCTV consisted of six constituents, referring to the 6th EWCS overview report [2]. Because five of the six questions were dichotomous scale and one was a five-point Likert scale question, one question was converted into a dichotomous scale in the process of setting it as a variable. Therefore, the loss of the information on the five-point scale question in this process remained a limitation of this study. This limitation was due to the absence of objective tools to measure WCTV for the data we used in this study. It is necessary to conduct research using validated measurement tools such as the KEYS [36] and Work Design Questionnaire [37] in future studies. However, the constitute of WCTV was analogous to decision latitude scale of Job Content Questionnaire and Demand Control Support Questionnaire, which have proven validity [38,39]. And the results of this study were similar to those of previous studies related to WCTV [17,40], which means that the measurement tools of this study were largely valid. Third, the loss of information occurred in the process of converting the subjective well-being variable to a dichotomous scale remained a limitation

of this study. As a result, the information that the original variable had might be oversimplified. However, this process allowed to show how much each factor had effects on well-being more intuitively adjusting covariates with multiple logistic regressions. In addition, the validity to use 50 points as a threshold for poor subjective well-being was verified in previous studies [15,16]. Fourth, it is necessary to conduct a longitudinal study related to well-being and job training in later studies because this study did not reveal the causal relationship between training and subjective well-being because of the inherent limitations of a cross-sectional study. However, this study had great significance as it displayed a new relationship between job training, well-being, and WCTV. Finally, failure to take into account the quality and content of job training when showing the results remained a limitation of this study, as there was no content related to the quality and content of the training. Still, we explained the results using given variables, such as self-technical level assessment and WCTV.

5. Conclusion

Job training has had different effects on subjective well-being, depending on the type and frequency of training. For entire samples, TPE harmed well-being when training went on for more than 3 days in the last 12 months, and TPO had a positive effect on well-being when duration was 1–3 days. These results showed different aspects, depending on the level of WCTV. In the case of the high WCTV group, the aforementioned results were reaffirmed, but in the case of low WCTV, job training did not have a statistically significant impact on subjective well-being. These differences, depending on the type of training and the WCTV, might be due to differences in the need and motivation of workers for training. OJT had not related to well-being regardless of the level of WCTV. In addition, the effect of job training was also different depending on the occupation. Therefore, it is imperative to comprehensively apply different types of job training in accordance with the characteristics of occupations to uplift workers' well-being.

Conflicts of interest

All authors have no conflicts of interest to declare.

Appendix A

Logistic regression analysis on well-being in accordance with technical level self-assessment (training need). Odds ratio (95% confidence interval)

Covariates		Need further training (underskilled) (N = 3,164)	Correspond well with duties (N = 22,652)	Can cope with more demanding duties (overskilled) (N = 6,000)
Sex	Female	1.00	1.00	1.00
	Male	1.02(0.86–1.21)	0.92(0.87–0.99) *	0.93(0.82–1.05)
Age	<40	1.00	1.00	1.00
	40–49	0.81(0.66–1.00) *	0.88(0.81–0.96) **	0.92(0.79–1.07)
	50–59	0.97(0.76–1.24)	0.90(0.83–0.99) *	0.90(0.77–1.06)
	≥60	0.98(0.68–1.42)	0.87(0.77–0.97) *	0.90(0.72–1.13)
Educational level	Under high school	1.00	1.00	1.00
	High school	2.10(1.46–3.00) ***	1.29(1.16–1.43) ***	1.17(0.94–1.45)
	Bachelor's degree	2.52(1.73–3.68) ***	1.67(1.48–1.88) ***	1.35(1.07–1.71) *
	Masters or higher	2.28(1.24–4.19) **	1.57(1.16–2.12) **	1.89(1.10–3.27) *
Numbers of employee	1	1.00	1.00	1.00
	2–9	1.13(0.65–1.99)	1.16(0.99–1.37)	1.12(0.81–1.54)
	10–49	0.91(0.51–1.60)	1.14(0.96–1.35)	0.99(0.71–1.37)
	50–249	0.97(0.53–1.75)	1.13(0.94–1.35)	1.05(0.74–1.50)
	Over 250	0.85(0.46–1.60)	1.07(0.87–1.31)	0.83(0.57–1.22)
Employment status	Self-employed	1.00	1.00	1.00
	Employer		2.41(0.28–21.11)	0.76(0.10–5.51)
	Employee	1.35(0.46–1.29)	0.95(0.58–1.55)	1.64(0.72–3.75)
	Unpaid family worker	0.73(0.23–2.27)	0.81(0.49–1.34)	1.28(0.54–3.03)
Working hours per week	41–52	1.00	1.00	1.00
	Under 41	1.02(0.81–1.29)	1.08(0.99–1.17)	0.97(0.83–1.13)
	Over 52	0.82(0.62–1.09)	0.81(0.73–0.89) ***	0.76(0.63–0.91) **
Working days per week	4–5	1.00	1.00	1.00
	Under 4	0.76(0.50–1.16)	0.94(0.83–1.08)	0.71(0.56–0.90) **
	Over 5	1.41(1.08–1.83) *	1.02(0.94–1.17)	0.88(0.75–1.04)
Subjective health	Low	1.00	1.00	1.00
	Medium	2.61(1.56–4.37) ***	1.99(1.71–2.31) ***	2.04(1.44–2.89) ***
	High	6.63(3.98–11.05) ***	4.64(3.99–5.40) ***	4.86(3.44–6.85) ***
On-the-job training	No	1.00	1.00	1.00
	Yes	1.17(0.94–1.45)	0.99(0.90–1.08)	1.00(0.83–1.19)
Training paid for or provided by employer	None	1.00	1.00	1.00
	1–3 days	0.83(0.66–1.05)	1.05(0.95–1.16)	0.92(0.76–1.12)
	Over 3 days	0.88(0.69–1.13)	0.94(0.84–1.05)	0.72(0.59–0.88) **
Training paid by oneself	None	1.00	1.00	1.00
	1–3 days	2.18(1.39–3.42) ***	1.35(1.05–1.73) *	1.89(1.21–2.96) **
	Over 3 days	0.85(0.56–1.29)	0.96(0.71–1.30)	1.04(0.64–1.68)
Work creativity and task variety	Low	1.00	1.00	1.00
	High	1.22(1.02–1.46) *	1.22(1.13–1.31) ***	1.11(0.97–1.28)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Appendix B

Logistic regression analysis on well-being in accordance with technical level self-assessment (training needs), work creativity, and task variety. Odds ratio (95% confidence interval)

	Work creativity and task variety					
	Low (N = 20,714)			High (N = 11,102)		
	Technical level self-assessment					
	Need further training (N = 1,594)	Correspond well with duties (N = 15,059)	Can cope with more demanding duties (N = 4,061)	Need further training (N = 1,570)	Correspond well with duties (N = 7,593)	Can cope with more demanding duties (N = 1,939)
Sex						
Female	1.00	1.00	1.00	1.00	1.00	1.00
Male	1.08 (0.84–1.37)	0.89 (0.82–0.96)**	0.90 (0.78–1.05)	0.94 (0.73–1.20)	0.98 (0.87–1.10)	0.95 (0.76–1.20)
Age						
<40	1.00	1.00	1.00	1.00	1.00	1.00
40–49	0.88 (0.65–1.20)	0.85 (0.76–0.94)	0.91 (0.75–1.11)	0.76 (0.57–1.01)	0.93 (0.82–1.07)	0.91 (0.71–1.18)
Educational level						
50–59	0.84 (0.60–1.16)	0.83 (0.75–0.93)**	0.84 (0.69–1.03)	1.12 (0.77–1.64)	1.04 (0.89–1.21)	1.02 (0.76–1.37)
≥60	0.79 (0.50–1.25)	0.78 (0.68–0.89)***	0.81 (0.63–1.05)	1.56 (0.76–3.21)	1.24 (0.96–1.60)	1.27 (0.75–2.15)
Under high school	1.00	1.00	1.00	1.00	1.00	1.00
High school	1.88 (1.23–2.86)**	1.25 (1.12–1.40)***	1.15 (0.91–1.45)	1.60 (0.73–3.52)	1.44 (1.09–1.90)**	1.12 (0.63–1.98)
Bachelor's degree	2.46 (1.56–3.86)***	1.63 (1.42–1.87)***	1.42 (1.09–1.85)**	1.71 (0.77–3.81)	1.80 (1.35–2.40)***	1.09 (0.61–1.95)
Masters or higher	2.19 (0.67–7.16)	1.54 (0.94–2.52)	1.57 (0.49–5.05)	1.61 (0.62–4.19)	1.70 (1.09–2.65)	1.87 (0.84–4.17)
				*		
Numbers of employee						
1	1.00	1.00	1.00	1.00	1.00	1.00
2–9	1.39 (0.71–2.73)	1.15 (0.97–1.38)	1.13 (0.80–1.61)	0.66 (0.20–2.19)	1.16 (0.73–1.83)	0.99 (0.43–2.29)
10–49	0.98 (0.50–1.95)	1.07 (0.89–1.29)	0.99 (0.69–1.42)	0.61 (0.19–2.03)	1.27 (0.80–2.03)	0.90 (0.39–2.09)
50–249	1.00 (0.48–2.07)	1.12 (0.91–1.37)	1.17 (0.78–1.75)	0.68 (0.20–2.33)	1.14 (0.70–1.84)	0.82 (0.35–1.93)
Over 250	1.34 (0.58–3.11)	1.13 (0.89–1.43)	0.89 (0.57–1.40)	0.50 (0.15–1.75)	1.01 (0.62–1.66)	0.68 (0.28–1.64)
Employment status						
Self-employed	1.00	1.00	1.00	1.00	1.00	1.00
Employee	1.45 (0.23–9.20)	0.28 (0.01–5.48)	0.97 (0.30–3.20)	2.01 (0.20–9.26)	1.39 (0.58–3.33)	1.23 (0.13–11.38)
Employee	0.65 (0.10–4.44)	0.73 (0.40–1.35)	0.76 (0.22–2.57)	1.36 (0.26–7.19)	1.23 (0.49–3.07)	3.00 (0.85–10.64)
Unpaid family worker	1.00	1.00	1.00	1.00	1.00	2.37 (0.58–9.65)
Working hours per week						
41–52	1.00	1.00	1.00	1.00	1.00	1.00
Under 41	1.00 (0.71–1.39)	1.04 (0.94–1.14)	0.94 (0.58–0.99)	1.05 (0.75–1.47)	1.18 (1.02–1.38)	1.05 (0.80–1.39)
Over 52	0.83 (0.56–1.21)	0.81 (0.72–0.90)***	0.81 (0.71–1.03)	0.83 (0.54–1.29)	0.81 (0.67–0.98)	0.61 (0.43–0.88)**
			*		*	
Working days per week						
4–5	1.00	1.00	1.00	1.00	1.00	1.00
Under 4	0.83 (0.51–1.34)	1.00 (0.87–1.15)	0.76 (0.58–0.99)	0.79 (0.31–1.99)	0.58 (0.39–0.88)**	0.54 (0.29–1.00)
Over 5	1.43 (1.00–2.03)*	0.99 (0.90–1.10)	0.86 (0.71–1.03)	1.36 (0.91–2.05)	1.11 (0.93–1.32)	0.94 (0.67–1.30)
Subjective health						
Low	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.51 (0.81–2.83)	1.96 (1.66–2.32)***	1.73 (1.19–2.53)**	7.55 (2.92–19.49)***	2.17 (1.50–3.14)***	5.52 (1.99–15.30)**
High	4.42 (2.36–8.28)	4.31 (3.65–5.10)***	3.86 (2.66–5.60)***	16.22 (6.35–41.47)***	6.01 (4.18–8.63)***	15.86 (5.78–43.51)***

On-the-job training						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.26 (0.89–1.78)	1.03 (0.92–1.17)	0.93 (0.74–1.17)	1.14 (0.86–1.50)	0.92 (0.79–1.06)	1.08 (0.82–1.43)
Training paid for or provided by employer						
None	1.00	1.00	1.00	1.00	1.00	1.00
1–3 days	1.21 (0.85–1.73)	1.12 (0.99–1.27)	0.90 (0.70–1.17)	0.60 (0.44–0.82)**	0.95 (0.82–1.11)	0.94 (0.68–1.28)
Over 3 days	0.96 (0.63–1.47)	0.94 (0.80–1.11)	0.75 (0.56–1.00)	0.79 (0.57–1.10)	0.94 (0.80–1.11)	0.69 (0.52–0.92)
		*			*	
Training paid by oneself						
None	1.00	1.00	1.00	1.00	1.00	1.00
1–3 days	2.06 (1.00–4.23)	1.12 (0.78–1.61)	1.24 (0.65–2.39)	2.24 (1.26–3.99)**	1.60 (1.13–2.27)**	2.54 (1.35–4.77)**
Over 3 days	0.76 (0.28–2.06)	1.05 (0.62–1.77)	0.93 (0.38–2.28)	0.83 (0.52–1.33)	0.99 (0.67–1.45)	1.16 (0.64–2.11)

*p < 0.05, **p < 0.01, ***p < 0.001.

Appendix C

Stepwise logistic regression analysis on well-being by occupations. Odds ratio (95% confidence interval)

Covariates	Managers (N = 140)	Professionals (N = 5,586)	Clerk (N = 6,362)	Services worker (N = 3,678)	Sales worker (N = 4,783)	Agricultural worker (N = 1,267)	Craft workers (N = 2,554)	Plant and machine operators (N = 2,865)	Elementary occupation (N = 4,584)
Sex									
Female							1.00		
Male							0.79 (0.63–0.98) *		
Age									
<40	1.00			1.00					
40–49	0.83 (0.71–0.95) **			0.90 (0.72–1.13)					
50–59	1.04 (0.86–1.25) **			0.60 (0.49–0.72) ***					
≥60	1.17 (0.80–1.70)			0.62 (0.49–0.77) ***					
Educational level									
Under high school	1.00		1.00		1.00		1.00		
High school	1.10 (0.53–2.31)		1.08 (0.53–2.20)		1.37 (1.01–1.87) *		1.28 (1.01–1.63) *		
Bachelor's degree	1.73 (0.84–3.58)		1.44 (0.71–2.89)		1.59 (1.16–2.18) **		1.60 (1.22–2.09) ***		
Masters or higher	1.86 (0.87–4.00)		0.79 (0.34–1.84)		1.86 (0.48–7.25)		3.36 (0.41–27.25)		
Numbers of employee									
1	1.00				1.00	1.00	1.00		
2–9	0.90 (0.56–1.46)				1.01 (0.73–1.39)	3.79 (2.12–6.78) ***			
10–49	0.89 (0.55–1.43)				0.68 (0.49–0.96) *	2.82 (1.03–7.72) *			
50–249	0.76 (0.46–1.24)				0.88 (0.59–1.30)	1.50 (0.37–6.10)			
Over 250	0.57 (0.34–0.95) *				0.80 (0.50–1.28)	2.56 (0.87–7.56)			
Employment status									
Self-employed					1.00	1.00			
Employer					1.82 (0.62–5.37)	0.24 (0.08–0.73) *			
Employee					1.31 (0.44–3.96)	0.18 (0.06–0.49)			
Unpaid family worker						***			
Working hours per week									
41–52	1.00		1.00		1.00	1.00	1.00	1.00	
Under 41	1.25 (1.08–1.45) **		1.16 (1.01–1.33) *		1.04 (0.89–1.22)	1.07 (0.78–1.48)	0.81 (0.67–0.98) *		
Over 52	0.75 (0.57–0.99) *		0.61 (0.45–0.82) **		0.77 (0.64–0.92) **	0.66 (0.45–0.96) *	0.53 (0.42–0.67) ***		
Working days per week									
4–5							1.00		
Under 4							0.57 (0.37–0.89) *		
Over 5							0.83 (0.50–1.37)		
Subjective health									
Low	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Medium	3.19 (1.91–5.34) ***		2.31 (1.31–4.05) **	1.93 (1.35–2.78) ***	2.02 (1.22–3.35) **	1.29 (0.96–1.73)	1.68 (1.01–2.81) *	2.30 (1.38–3.84) **	2.20 (1.72–2.81) ***
High	7.49 (4.53–12.37) ***		5.06 (2.91–8.80) ***	4.06 (2.84–5.80) ***	4.49 (2.73–7.40) ***	3.29 (2.40–4.51) ***	4.54 (2.73–7.54) ***	5.68 (3.43–9.42) ***	5.56 (4.36–7.10) ***
On-the-job training									
Yes			0.83 (0.71–0.97) *	1.42 (1.11–1.81) **					
None									
Training paid for or provided by employer									
None				1.00					
1–3 days				0.87 (0.69–1.10)					
Over 3 days				0.76 (0.58–1.01)					
Training paid by oneself									
None	1.00		1.00						
1–3 days	1.50 (1.08–2.09) *		1.67 (1.05–2.67) *						
Over 3 days	0.96 (0.69–1.32)		0.57 (0.37–0.88) *						
Work creativity and task variety									
Low			1.00	1.00		1.00	1.00	1.00	1.00
High			1.14 (1.01–1.29) *	1.33 (1.10–1.61) **		1.48 (1.07–2.06) *	1.44 (1.19–1.74) ***	1.88 (1.46–2.42) ***	

*p < 0.05, **p < 0.01, ***p < 0.001.

Appendix D

Stepwise logistic regression analysis of variables related to well-being by the level of work creativity and task variety. Odds ratio (95% confidence interval)

Covariates		All (N = 31,907)	Work creativity and task variety	
			Low (N = 20,788)	High (N = 11,119)
Sex	Female	1.00	1.00	
	Male	0.94(0.89–0.99) *	0.91(0.85–0.97) **	
Age	<40	1.00	1.00	1.00
	40–49	0.88(0.82–0.94) ***	0.86(0.79–0.94) ***	0.91(0.81–1.01)
	50–59	0.91(0.85–0.98) *	0.84(0.77–0.92) ***	1.03(0.91–1.17)
	≥60	0.88(0.80–0.97) *	0.78(0.70–0.88) ***	1.23(1.00–1.52)
Educational level	Under high school	1.00	1.00	1.00
	High school	1.30(1.19–1.42) ***	1.27(1.15–1.40) ***	1.41(1.12–1.78) **
	Bachelor's degree	1.64(1.49–1.82) ***	1.65(1.47–1.84) ***	1.67(1.32–2.12) ***
	Masters or higher	1.63(1.29–2.07) ***	1.57(1.03–2.38) *	1.76(1.24–2.49) **
Numbers of employee	1	1.00		1.00
	2–9	1.15(1.00–1.32)		1.21(0.87–1.67)
	10–49	1.09(0.94–1.26)		1.26(0.90–1.75)
	50–249	1.09(0.94–1.28)		1.16(0.82–1.63)
	Over 250	1.00(0.84–1.18)		0.99(0.70–1.41)
Employment status	Self-employed	1.00	1.00	
	Employer	0.80(0.25–2.54)	0.21(0.02–2.74)	
	Employee	1.11(0.75–1.64)	0.89(0.54–1.47)	
	Unpaid family worker	0.90(0.60–1.34)	0.74(0.45–1.24)	
Working hours per week	41–52	1.00	1.00	1.00
	Under 41	1.05(0.98–1.12)	1.00(0.93–1.07)	1.14(1.01–1.28) *
	Over 52	0.80(0.73–0.86) ***	0.81(0.73–0.88) ***	0.77(0.66–0.89) ***
Working days per week	4–5	1.00		1.00
	Under 4	0.88(0.79–0.98) *		0.60(0.44–0.82) **
	Over 5	1.02(0.95–1.10)		1.09(0.94–1.26)
Subjective health	Low	1.00	1.00	1.00
	Medium	2.01(1.76–2.30) ***	1.88(1.62–2.18) ***	2.83(2.06–3.88) ***
	High	4.75(4.16–5.42) ***	4.22(3.64–4.88) ***	7.55(5.53–10.30) ***
On-the-job training	No			
Training paid for or provided by employer	Yes			
	None	1.00	1.00	1.00
	1–3 days	1.01(0.93–1.09)	1.10(1.00–1.22)	0.89(0.78–1.00)
Training paid by oneself	Over 3 days	0.88(0.81–0.96) **	0.90(0.80–1.02)	0.85(0.75–0.96) **
	None	1.00		1.00
Work creativity and variety	1–3 days	1.56(1.28–1.89) ***		1.85(1.41–2.41) ***
	Over 3 days	0.92(0.74–1.14)		0.95(0.74–1.24)
	Low	1.00		
	High	1.19(1.12–1.26) ***		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Appendix A. Supplementary data

Supplementary data related to this article can be found online at <https://doi.org/10.1016/j.shaw.2020.08.006>

Appendices

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