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Original article

Workability and Life Satisfaction: Effects of Workers' Positive Perceptions on Their Return to Jobs



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ABSTRACT

Background: The death rate of workers due to industrial accidents in South Korea (3.61 persons in 2017) is higher than the Organization for Economic Cooperation and Development average (2.43) and the fifth highest among Organization for Economic Cooperation and Development member countries. Although the pandemic of novel coronavirus (COVID-19) has changed, the socioeconomic aspects of Korean society, the number of Koreans suffering accidents and the number of deaths in 2020 have increased. It is necessary to take measures to prevent accidents and make comprehensive efforts to return to work. This study proposes research questions about the effect of workers' positive perception on whether to work after accidents and the impact of the experience of rehabilitation services on the return to work.

Methods: This research performed a panel logistic regression analysis using data on workers' compensation insurance in Korea for two years (2018–2019).

Results: This research finds that workers' positive perceptions of workability and life satisfaction contributed affirmatively to their re-employment. Several factors related to employment (e.g., work period, the number of job qualifications) also positively affect their return to work. However, the experience of rehabilitation services did not have a significant effect on re-employment. The variables of their health conditions (e.g., disability grade, feelings of health problems, age) negatively influenced their return to jobs.

Conclusion: These results suggest the importance of workers' mental recovery and the need to innovate rehabilitation services for their employment. Positive thinking and self-rehabilitation could be critical for workers, parallel with social welfare policies.

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1. Introduction

1.1. Research backgrounds

South Korea has encountered a sequel of the pandemic of the novel coronavirus (COVID-19) and a university student's tragic death due to industrial accidents in Pyeongtaek Port (occurring on April 22, 2021) [1,2]. Korea's fatalities by accidents per 100,000 industrial workers (3.61 people) were higher than the average of 35 Organization for Economic Cooperation and Development (OECD) member countries (2.43 people), ranking fifth highest among OECD members in 2017 [3]. Concurrently, the number of deaths from accidents in the construction industry was 506 (52.5% of all industries), the second-highest among OECD members; this

mortality was twice the average of OECD members (24.6%) [3]. In 2020, the number of deaths due to industrial accidents in Korea was 882, which increased despite the outbreak of the novel coronavirus (Fig. 1).

Fatalities occurred in the construction and manufacturing industries, and the casualties occurred in medium-sized businesses (5–49 people) or small (less than five people) enterprises comprising the majority of the statistics. This situation in which many accidents occur in specific industries and workplaces could require appropriate policies for workers' return to work, and fundamental efforts need to be made to prevent industrial accidents.

Considering the implication (Fig. 1) that the occurrence of industrial accidents is higher than expected, it could be critical for

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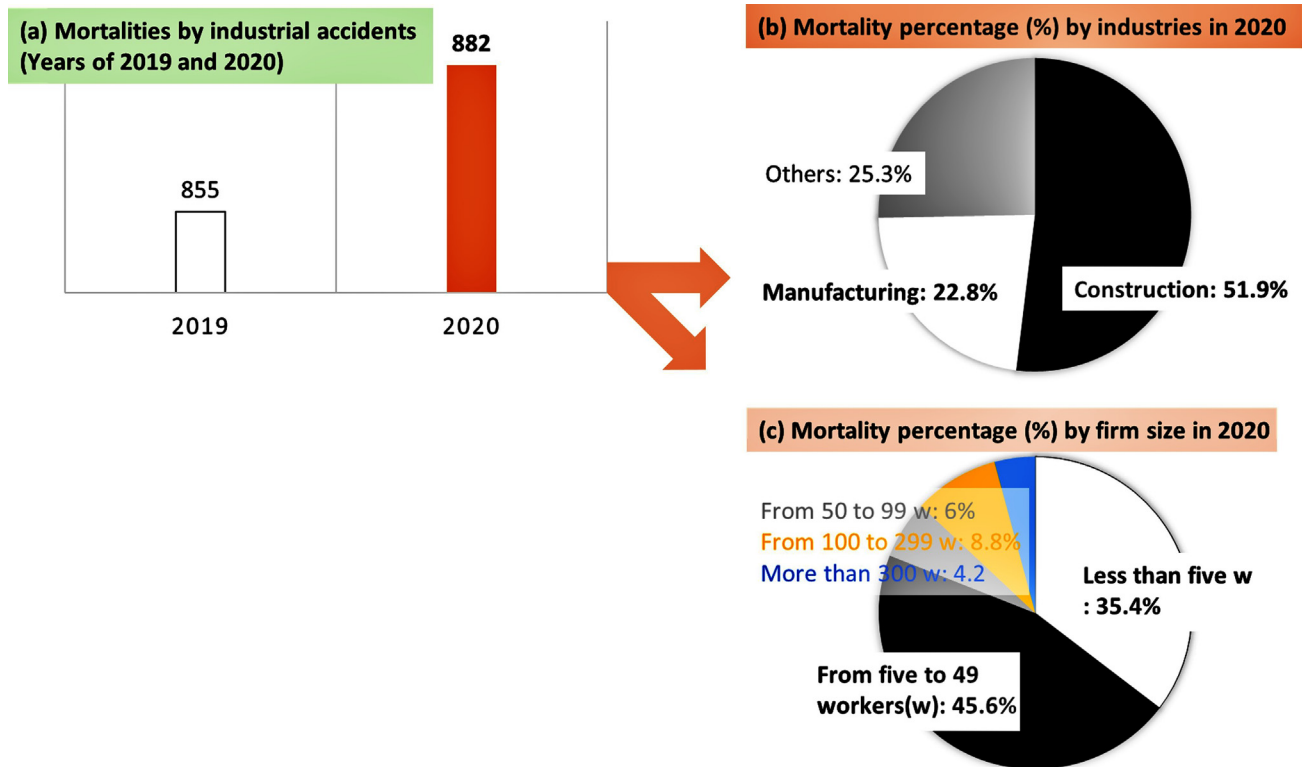


Fig. 1. Statistics about fatalities caused by industrial accidents in Korea (2019–2020).

※ Sources: (a) MOEL [4], (b), and (c) KOSHA [5].

All the works are outlined and designed by the author. MOEL, Ministry of Employment and Labor; KOSHA, Korea Occupational Safety and Health Agency.

workers suffering due to the accidents to be closely connected with their efforts, help through policies, and obtain the appropriate recovery period (e.g., the timing of rehabilitation) for their return to jobs. The accidents would be workers' turning points, which can influence their whole work lives in various ways, wherein they put a lot of time and effort into living. In addition to physical and material support, the mental recovery of workers injured after an accident can be particularly significant for returning to daily life and work.

Regarding workers' return to work after industrial accidents, the literature has focused on the rehabilitation effects of public policies. For example, the Korea Workers' Compensation and Welfare Services (KCOMWEL) has provided a variety of rehabilitation services for workers to return to their jobs and daily lives, such as vocational rehabilitation for improving vocational training and work ability, and social rehabilitation for physical and psychological recovery [6]. Other studies have confirmed that workers' experience of treatment or nursing-related rehabilitation policy [7], services of vocational rehabilitation [8], doctor's consultation [9], and psychological rehabilitation services [10] positively contributed to their (re)employment.

However, one's will (or positive awareness) and various social welfare policies could be significant factors for workers to overcome their accidents or illness caused in their workplaces where work intensity can increase due to a competitive atmosphere. For example, workers' beliefs and positive recognition [11] and emotional expectations [12,13] about returning to work after recovery from cancer or back pain can positively affect their return to jobs.

Therefore, this research proposes the following research questions (RQ) on workers' return to their job market after industrial accidents. Above all (RQ1), how do their positive perceptions

(workability and life satisfaction, respectively) affect their return to work? Furthermore (RQ2), do their experiences on public policies of rehabilitation services (e.g., vocational and social rehabilitation, respectively) influence their return to work?

This study utilizes the two-year panel data on industrial accident insurance (the cohort of the second generation: Survey data in 2018 and 2019), performing panel logistic regression on whether workers' positive perceptions, experiences in rehabilitation services, including demographic characteristics, affect their return to work. As a result, their positive perceptions of work and life satisfaction positively influenced their return. In addition, the degree of disability from accidents, their efforts to work (e.g., qualifications or licenses), income, and age had significant effects on the return. These findings suggest that the government needs to improve its present policies for workers and welfare services for overcoming industrial accidents achieving a balanced recovery in their mental and physical health.

1.2. Literature review about influential factors for return to work

The main factors influencing workers' return to work could include their will and emotional aspects, public policies, and demographic characteristics of workers. The ability to work (workability), job self-efficacy, and the value of work positively affected the return to jobs of those who suffered from cancers caused by their work [11]. In the case of workers with back pain, the positive expectation of their return to work made productive contributions to their employment [12]. Some workers encountering relatively mild back pain could achieve their return to work with the help of their expectation of promising recovery [13]. These findings could support the common implication that a positive mindset or

Table 1
Characteristics of the final sample

Categories	Contents
Data investigator	The Labor Welfare Research Institute of Korea Workers Compensation & Welfare Service (KCOMWEL)
Period of survey	The first (from August to October 2018) and the second investigation (from August to October 2019) based on the identical cohort (follow-up survey)
Method	Well-trained interviewers performed Tablet PC Assisted Personal Interviewing (TAPI) and checked the answers from workers or beneficiaries upon visit
Contents	The survey consists of two parts and features common questions to all respondents and specific ones to relevant respondents based on their economic status. 1. Common questions: demographic aspects, industrial accidents and insurances, workplaces at the accidents, the present economic status, work experience, health and daily lives, incomes, and household characteristics 2. Specific questions: workers returning to their original jobs, re-employed workers, the self-employed, the employees in their family business, the unemployed, and the economically inactive people
Sample	1. Respondents: 3,294 persons in the first survey and 2,965 persons in the follow-up survey (The ratio of sample retention: 90.01%. Population in 2017: 75,392 persons) 2. Sample design: Samples were designed based on several key factors: the levels of disability caused by industrial accidents (i.e., from first- to third-class, and no disability), and proportional sampling to the square root by other class and demographic variables (i.e., gender, age) ※ Factors for sampling: Six levels of disability (1-3st grade, 4-7, 8-9, 10-12, 13-14th grade, and a standard level), gender (two groups), age (four groups: Age 30 or younger, 40, 50, 60 or older), regions (six groups: the capital city of Seoul and Gangwon province, Gyeonggi province and Incheon metropolitan city, and other provinces/metropolitan cities), and rehabilitation services (two groups: vocation and social rehabilitation) 3. Excluded respondents: foreigners, residents in Jeju-do province, and insurance beneficiaries unspecified residency

*Source: Author's revised and outlined work based on the literature [6].

**Notes. The disability level consists of 14 grades (Please see Table 2). If the number of the grade is high, the feeling of a worker's difficulty in their labor or work could be severe or serious [6].

emotion related to workability can influence a worker's return to work from industrial accidents.

Apart from the individual efforts of the injured workers, public policy, or organizational efforts can also positively affect their return to jobs. For instance, KCOMWEL has offered various rehabilitation services, including vocational training, job searching, and social support, to help their emotional and psychological recovery (e.g., counseling and mentoring) [6]. In addition, the experience of vocational rehabilitation services of workers had a positive impact on their return to original or other workplaces [8].

The experiences of rehabilitation policies that workers received during the treatment period influenced their employment to another job in a workplace with five or more employees or regular workers in the same occupation [7]. In particular, consultation with the attending physician positively affected workers' return to work by industrial accident workers [9]. These

findings could establish a plausible hypothesis that workers' experience of rehabilitation services can have a positive expected effect on their return to work of industrially injured workers. Moreover, the lesser the pain caused by the disease and the sense of fatigue felt by the workers during their treatment process, the more these feelings positively contributed to their return to work [11]. Some recovery activities for such fatigue could be emphatically relevant to the re-employment of workers who have suffered a stroke [14].

Various demographic characteristics of injured workers could also influence their return to work. The type of occupational accidents encountered by workers and the degree of their disability grade could be directly related to the level and effort of recovery, and the period of their treatment, which can also have a significant effect on workers' return to work [7–9,15]. As the characteristics of their workplaces at the time of the accidents, the employment status of the workers (e.g., whether they were full-time workers or not), the features of their job (e.g., managerial or professional [15]), and the size of the workplaces/firms could also be factors that (in) directly affects the workability of workers [7,8,15,16]. Some demographic variables (e.g., age, gender, education level, marriage, income, and residence of metropolitan cities) could be influencing their return to work [7–9,15,17].

To summarize the literature review so far, emotional expectations and satisfaction about the ability or feeling to work, rehabilitation services experience, the impact of industrial accidents, and personal circumstances could be critical factors in workers' return to job markets after accidents. Therefore, this study analyzes the effects of the variables on workers' return to their original/new jobs in the following sections.

2. Materials and methods

2.1. Materials: panel data of two-year survey sample

This research utilizes the sample data, which is the first two-year data (2018–2019) of the second cohort survey in the panel study of workers' compensation insurance (PSWCI) provided by the KCOMWEL. The present data consist of three parts: repeated contents (e.g., personal characteristics, identification of current economic activity), past ones (e.g., the records of industrial accidents and relevant insurances), and newly gathered information (e.g., respondents' changes in jobs) [18]. The data reflect detailed information on industrial accidents (e.g., accident situation, emergency treatment), the environment of workplaces (e.g., interpersonal relationships), and workers' households (e.g., family income); these are the new information that the first cohort survey did not consider [6,9,18]. The sample in 2019 is the follow-up part of the data in 2018, which was obtained from the homogeneous cohort population and respondents (sample retention rate: 90%; Table 1).

This study empirically defines all variables shown in Table 2. The dependent variable is the status of workers' return to work after an industrial accident, such as their reversion to original or new jobs [8]. Concerning return to work, the quality of employment (e.g., full-time workers, firm size [7]), which could reflect workers' welfare (e.g., differences in salaries), could be a potential alternative to the status variable. However, as accidents could be critical shocks in workers' life history, their return to work would be more severe than those who did not suffer similar accidents.

Therefore, this study denotes the dependent variable by focusing on workers' returns to original or new jobs. This research reflects important independent variables of their recognition (work, life) and experience of rehabilitation services offered by the government as welfare policies. The research also includes control variables of their information on accidents, workplaces, and

Table 2
Measurement of dependent and independent variables

Categories	Notation and definition	Measurement
DV	The employed Job (Duv) -Waged workers	※ Nom 1: Waged workers in 2018 or 2019 (A person who returns to their original job or finds a new job) 0: Others (Ref)
IV	Positive recognition PosThink -Positive awareness about workability	※ Ord: 4-point Liks 1 (Not positive in general), 2 (Normal), 3 (Positive in general), 4 (Always positive)
	Satis -Overall satisfaction in their life	※ Ord: 5-point Liks 1 (Very dissatisfactory), 2 (Dissatisfactory), 3 (Normal), 4 (Satisfactory), 5 (Very satisfactory)
PV	Experience on rehabilitation services SvcJob -Services of vocational rehabilitation (Duv)	※ Nom 1: I have used the services more than once. 0: None (Ref)
	SvcSoc -Services of social rehabilitation (Duv)	※ Nom 1: I have used the services more than once. 0: None (Ref)
CV	Health DifHeal -Feeling of difficulties in work due to health problem	※ Ord: 4-point Liks 1 (Not at all), 2 (No), 3 (Somewhat agreed), 4 (Very agreed)
	Impacts by industrial accidents RatDisa -Degrees of workers' disability	※ Ord 0 (Standard), 1 (14th grade), 2 (13th grade), ..., 13 (2nd grade), 14 (1st grade)
Personal features	NLices -Numbers of licenses/qualifications for jobs	※ Rat 0 (None), 1, 2, 3, ..., n (Maximum values)
	PerWork -A work period before industrial accidents	※ Ord 1 (Less than a month), 2 (Less than two months), 3 (Less than a quarter), ..., 7 (More than six months), 8 (More than a year), 9 (More than two years), ..., 11 (More than four years), 12 (More than five years but less than 10 years), 13 (More than 10 years but less than 20 years), 14 (More than 20 years)
Demographic factors	Age	※ Ord: 4-point Liks 1 (Age 30 or younger), 2 (Age 40), 3 (Age 50), 4 (Age 60 or older)
	Male (Duv) -Gender	※ Nom 1: Male. 0: Female (Ref)
	Educ -The highest level of education	※ Ord: 5-point Liks 1 (Uneducated), 2 (Graduated from an elementary school), 3 (Middle school), 4 (High school), 5 (Bachelor's degree or higher)
	Marriage (Duv) -Marriage or single at the time of his/her industrial accident	※ Nom 1: Married. 0: Others (Ref)
	HouseInco -Natural logged value of household income (Unit: 10 thousand Korean won)	※ Rat Total incomes of household; Sum of labor and business incomes
	Metropol (Duv) -Residential area of metropolitan cities (Duv)	※ Nom 1: Seoul and neighboring metropolitan regions (i.e., Gyeonggi and Gangwon provinces, and Incheon city) 0: Others (Ref)

*Notes. DV, Dependent Variable; IV, Independent Variables; PV, Policy Variable; CV, Control Variable; Duv, Dummy Variable; Ref, Reference or base group for a relevant dummy variable; Nom, Nominal variable; Ord, Ordinal variable; Rat, Ratio variable; Liks, Likert scale.

**Sources: Author's outlined work based on the literature [6,18].

personal/demographic aspects. The study recodes several variables (e.g., the levels of overall satisfaction in life and disability grade in Table 2) by converting values in ascending order for the convenience of interpreting the factors.

2.2. Methodologies: panel logistic regression

This research performs a panel logistic regression to determine the effect of workers' positive recognition and relevant variables on their return to work. Since the dependent variable refers to

whether workers suffering accidents return to their original/another job or not, this study establishes a panel model of a binary logistic regression in Equation (1-2).

$$K_i = P(Y_{it}|X_{it}) = \frac{1}{1 + e^{-(b_0 + b_i X_{it})}} \quad (1)$$

$$\ln\left(\frac{K_i}{1 - K_i}\right) = b_0 + b_i X_{it} + a_i + u_{it} \quad (2)$$

*This research establishes Equations (1-2) based on the relevant literature [8,9,19,20].

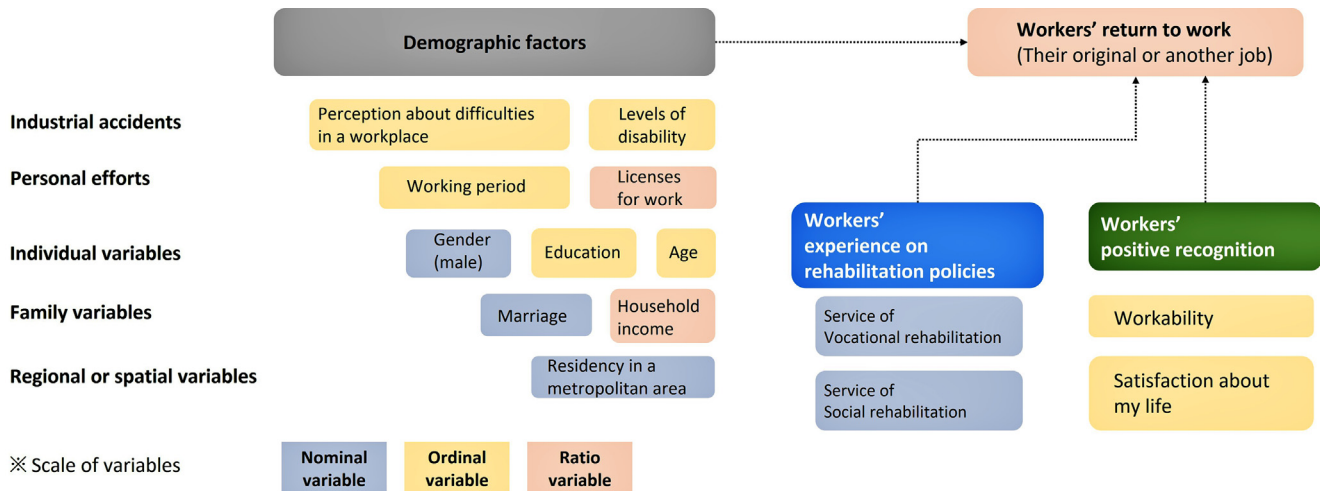


Fig. 2. The analytic framework of this research.
 * Source: Author's work.

* Notes. Y_{it} : observation i 's dependent variable at t ($t = 2018, 2019$). X_{it} : observation i 's independent variable at t . b_0 : constant term. a_i : observation i 's residual term that reflects i 's idiosyncratic characteristics at t . u_{it} : an observation i 's pure term of residual at t .

The research adopts independent variables that the study reviews in previous studies, such as workers' emotional expectations and satisfaction, their experience of rehabilitation services, the after effects of industrial accidents (e.g., the degree of disability), career before accidents (e.g., working period), and personal environment for health recovery (e.g., age, gender). Fig. 2 shows the analytical framework used in this research. All variables in this framework are defined and measured in Table 2.

3. Results

This study presents the results in the order of descriptive statistics of variables and findings of the principal analysis. Above all,

Table 3
 The proportional information of key variables

Key variables	Groups	Percentage (%)
Injured and recovered workers	Those returning to work	63
	Those not returning to work	37
Feelings of workability	1 (Not positive in general)	10
	2 (Normal)	25
	3 (Positive in general)	51
	4 (Always positive)	14
Feelings of life satisfaction	1 (Very dissatisfactory)	1
	2 (Dissatisfactory)	11
	3 (Normal)	50
	4 (Satisfactory)	37
	5 (Very satisfactory)	1
Experience of vocational rehabilitation services	Yes	15
	No	85
Experience of social rehabilitation services	Yes	18
	No	82
Age	1 (Age 30 or younger)	14
	2 (Age 40)	18
	3 (Age 50)	33
	4 (Age 60 or older)	35
Gender	Male	83
	Female	17

* Note. The total number of the sample is 2,965 persons.

Table 3 shows the proportional of key variables in this research. For example, the percentage of workers returning to work after industrial accidents is 63%. Many had positive feelings of workability (51%) and feelings of normal life satisfaction levels (50%). However, they did not have enough experiences of utilizing rehabilitation services in both vocational (15%) and social supports (18%).

This research also offers the statistics of variables that show some difference in factors' distribution (skewness, kurtosis) due to various ranges in values (minimum and maximum values) in Table 4. The study also checked the correlation of factors, and the correlation coefficient values were [-0.357, 0.356]. This low correlation could support that the problem of multicollinearity of the independent variable is not serious.

This study implemented a panel logistic regression with the option of a robust estimation method considering the random effect and heterogeneity of the data (Table 5). The results show that workers' positive perceptions of workability and overall satisfaction with life positively influenced their return to job markets. As employment-related factors, work period and the number of job qualifications also contributed positively to the return. Their total household income and residency in metropolitan areas positively

Table 4
 Descriptive statistics of variables

Variables	Mean	SD	Min	Max	Skew	Kurt
Job (DV, Duv)	0.611	0.487	0	1	-0.457	1.208
PosThink	2.679	0.818	1	4	-0.344	2.671
Satis	3.220	0.724	1	5	-0.489	3.154
SvcJob (Duv)	0.123	0.328	0	1	2.302	6.300
SvcSoc (Duv)	0.172	0.377	0	1	1.739	4.025
DifHeal	3.965	0.699	1	4	-0.219	2.467
PerWork	5.682	4.339	1	14	0.388	1.734
NLices	0.486	0.988	0	11	3.510	23.000
Male (Duv)	0.828	0.378	0	1	-1.735	4.009
Metropol (Duv)	0.471	0.499	0	1	0.116	1.013
RatDisa	4.136	3.160	1	15	1.208	4.043
Educ	3.609	1.029	1	5	1.208	4.043
Age	2.812	1.071	1	4	-0.435	2.028
Marriage (Duv)	0.674	0.469	0	1	-0.744	1.553
HouseInco	7.717	2.114	0	10.524	-2.944	11.011

* Notes. DV, Dependent Variable; Duv, Dummy Variable; SD, Standard deviation; Min, Minimum value; Max, Maximum value; Skew, Skewedness; Kurt, Kurtosis.

Table 5
Results of panel logistic regression analysis

Variables	Level analysis (Variables)		Marginal analysis (Marginal effect at mean)	
	Coefficients	SE	Coefficients	SE
PosThink	0.777+++	(0.189)	0.084+++	(0.019)
Satis	0.984+++	(0.230)	0.106+++	(0.022)
SvcJobs (Duv)	-0.320	(0.406)	-0.035	(0.044)
SvcSoc (Duv)	-0.296	(0.338)	-0.032	(0.036)
DiffHeal	-1.458+++	(0.265)	-0.157+++	(0.022)
RatDisa	-0.333+++	(0.055)	-0.036+++	(0.004)
PerWork	0.164+++	(0.039)	0.018+++	(0.003)
NLices	0.511+++	(0.190)	0.055+++	(0.019)
Male (Duv)	0.602	(0.368)	0.065+	(0.039)
Metropol (Duv)	0.577++	(0.266)	0.062++	(0.028)
Educ	-0.059	(0.150)	-0.006	(0.016)
Age	-0.668+++	(0.189)	-0.072+++	(0.018)
Marriage (Duv)	-0.051	(0.308)	-0.005	(0.033)
HouseInco	0.821+++	(0.246)	0.089+++	(0.025)
Constant	-5.976+++	(2.231)	-	-
Observations	1,551			
Wald Chi-square test (<i>df.</i> : 13)	66.16+++			

※ Notes. SE, Standard Error; Duv, Dummy variable; *df.*, Degree of freedom; +++, *p*-value<0.01; ++, *p*-value<0.05; +, *p*-value<0.1. The values in parentheses are robust standard errors.

Table 6
Usage in rehabilitation services and workers' barrier to services in Korea

Panel A. Workers' usage in rehabilitation services						
	Workers' use in services of vocational rehabilitation			Workers' use in services of social rehabilitation		
	2018	2019	Differences	2018	2019	Differences
Usage rate (%)	9.62	15.21	5.59pp	16.58	17.88	1.3pp
Beneficiaries (p)	317	451	134	546	530	-16
Respondents (p)	3,294	2,965	-329	3,294	2,965	-329
Panel B. Top nine contents that they are concerned about using services						
Ranking	Contents	2019(%)	Contents	2018(%)		
1	Limited services of various rehabilitation	23.54	ITLC	20.46		
2	Time limit to use services	18.38	Complicated procedure to use services	19.16		
3	Lack of information about services	17.98	ITLC	17.46		
4	Complicated procedure to use services	14.03	Time limit to use services	16.42		
5	Long distance (transportation) to use services	13.93	ITLC	12.69		
6	Complicated selection of service users	6.95	ITLC	8.86		
7	Uncomfortable convenience facilities and environment to use services	1.89	Others	2.03		
8	Others	1.75	Uncomfortable convenience facilities and environment to use services	1.61		
9	Long waiting time	1.55	ITLC	1.31		
Respondents (p)		2,965		-		3,204

※ Notes. ITLC: (The present content is) identical to the left content. pp, percentage (%) point. p, person(s).

*Source: KCOMWEL [21], outlined and designed by author.

affected their employment. However, disability grades, workers' feelings of health problems, and age negatively impacted the return. Using various rehabilitation services as policy variables did not significantly affect employment.

4. Discussion and implications

This study proposes several **RQs** and analyzes the effect of workers' positive perceptions (work and life), the experience of rehabilitation services, and demographic factors on their return to work. As key findings and answers to **RQ1**, the positive effects of their recognition of workability and overall satisfaction with life on the return could mean that the management of workers' mental health (e.g., mindfulness) is practically crucial in the process of their recovery. For instance, workers and policymakers need to be aware of the values of being able to work [11], expectations or beliefs about the return to work [12], and perceptions of their recovery after accidents [14]. The interconnection between workers' efforts and policy support could create synergistic effects for the recovery. These findings can provide governments with opportunities to refine the current counseling services of various rehabilitation [6] so that workers experience psychological recovery in reality.

Moreover, as answers to **RQ2**, the ambiguous employment effect of rehabilitation services could indicate the necessity of improving workers' service utilization. While the Korean government offers 11 rehabilitation services (six programs of vocational rehabilitation, five programs of social rehabilitation [6]), their usage in services is not high (vocational rehabilitation: 9.6%–15.2%, social rehabilitation: 16.6%–17.9%. Panel A in Table 6). As a plausible cause of this status, workers' perception level of the services seems to be low, and the information asymmetry between a government and them could be considerable (Panel B in Table 6). The common points of inconvenience they experience are the feeling of insufficient rehabilitation services (20.5%–23.5% in 2018 and 2019), restricted hours to use services (16.4%–18.4%), and inadequate information about services (17.5%–18%).

Respondents' measurement errors caused by survey items and common method bias (variance) caused by questionnaire designs might explain their feelings of inconvenience in services. However, this discrepancy in various policies and low services' usage could imply that a government needs to raise policy consumers' attention and decrease their information gap by using other effective public relations techniques.

Finally, the variables of workers' qualifications for jobs, household income, age, and residence in the metropolitan area may require a government to identify target groups for effective rehabilitation services. Our findings could explain why young workers with various qualifications, high income, and living in the metropolitan area could be more likely to be employed. These promising people seem to be target consumers for short-term policies that a government offers with limited capabilities.

Older workers living in non-metropolitan areas with low qualifications and incomes can have relatively low employment rates on average. These vulnerable people would need a government's welfare policy in the mid-to-long-term. Korean society has encountered serious problems of decreasing population and concentration in Seoul and its neighboring metropolitan cities due to increasing life expectancy and low birth rate, which could aggravate the lives of the vulnerable without well-designed rehabilitation policies.

5. Conclusion

This research focuses on the high incidence of industrial accidents in Korea, in contrast to other OECD members, and raises

research questions on the effects of workers' positive perceptions and their experiences of rehabilitation policies on their return to work. This study performs a panel logistic regression analysis using a survey dataset of Korea's industrial accidents. The research finds that their positive recognition of workability and life satisfaction influenced their return. Their preparation for work (e.g., work experience) and demographics (e.g., household income) also positively affected return. The level of disability after accidents, perception of health problems, and age had negative effects on return. However, their experience with rehabilitation services did not have significant effects. These findings can suggest practical implications for the importance of workers' efforts to recover physical and mental health as well as for the improvement on rehabilitation services from the viewpoint of policy consumers.

As this research established findings based on the analysis using short panel data, it needs to implement deep statistical analysis with long-term data to obtain generalizable implications. For example, alternative survival analysis methods and a system of equations could plausibly capture the causal relationship between variables more precisely. Future research also needs to consider new socio-cultural factors, such as workers' perspectives and their companies' policies.

Conflicts of interest

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Consent for publication

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