BMJ Open

Association of employment status and income with self-rated health among waged workers with disabilities in South Korea: population-based panel study

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To cite: Choi JW, Kim J, Han E, *et al*. Association of employment status and income with self-rated health among waged workers with disabilities in South Korea: population-based panel study. *BMJ Open* 2019;**9**:e032174. doi:10.1136/bmjopen-2019-032174

► Prepublication history and additional material for this paper are available online. To view, please visit the journal (http://dx.doi.org/10.1136/bmjopen-2019-032174).

Received 06 June 2019
Revised 16 October 2019
Accepted 25 October 2019

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ABSTRACT

Objective This study aimed to examine the association of employment status and income with self-rated health among waged workers with disabilities in South Korea.

Methods This study used the Panel Survey of Employment for the Disabled from 2011 to 2015. A total of 951 waged workers with disabilities were selected as baseline subjects in 2011 and were followed up for 5 years. This study used a generalised linear mixed model after adjusting for covariates.

Results Among 951 waged workers with disabilities, the results showed that 39.3% of workers with disabilities reported poor self-rated health. Workers with disabilities with a precarious employment status and lower income were 1.22 (95% CI 1.21 to 1.23) and 1.81 (95% CI 1.80 to 1.83) times more likely to have poor self-rated health than those with permanent employment and higher income, respectively. A subgroup analysis found that precarious workers with disabilities in lower income households had higher possibilities of poor self-rated health.

Conclusion This study suggests that precarious employment and lower income of waged workers with disabilities are significantly associated with poor self-rated health compared with those with permanent jobs or higher income.

Strengths and limitations of this study

- This study provides an evidence for health inequalities among waged workers with disabilities by employing a panel study design.
- The measurement of health status was subjective and could be subject to information bias.
- The actual prevalence of chronic diseases is likely higher than that reported in our data because some conditions may not have been diagnosed at the time of the survey. We also did not consider types of chronic diseases due to limited data.
- The results could possibly reflect reverse causality and bidirectional relationships regarding the association between the employment status and income with self-rated health.

INTRODUCTION

Self-rated health is an indicator used to evaluate general health.[1] It has often been used as a tool in sociological health research[2] and has been proposed as a health assessment screening tool.[3] Moreover, poor self-rated health has been shown to anticipate bad health outcomes or mortality.[3]

People with disabilities generally have worse health status than those without disabilities because they are more likely to report health-impairing behaviours, such as smoking, drinking, obesity, physical inactivity and limited health-promoting activities.[4–7] Furthermore, people with disabilities are susceptible to disability-related health problems, such as osteoporosis, weight problems, decreased balance, decreased strength and depression.[8] Thus, improving their health is a significant public health concern.

Previous research reported that low self-esteem,[9] lower quality of life,[10] later-onset disability,[11] depressive symptoms,[12] unmet healthcare needs[13] and unmet needs for physical assistance[14] were associated with poor self-rated health among people with disabilities. Socioeconomic status factors, such as employment status or income level, could also be used to predict health status. In the general population, low socioeconomic status negatively affects self-rated health,[15–23] but little is known about how social determinants affect the health status of people with disabilities.

Economic activities of people with disabilities are important because increased income and demonstrating their abilities to perform certain tasks may improve their quality of life.[24] Although the employment rate of people with disabilities (50.2%) in 2016 was lower than that of the general population (66.3%) in South Korea, the employment

rate is increasing among the disabled population (46.5% in 2010 to 50% in 2016).[25] However, the proportion of non-permanent employment is increasing among waged workers with disabilities (33.1% in 2010 to 43.9% in 2016). These statistics imply that discrimination against waged workers with disabilities has intensified, despite the increasing employment rate. Therefore, identifying the negative factors associated with non-permanent employment is important in solving the employment discrimination issue among the disabled population.

Compared with permanent positions, non-permanent positions are associated with a harmful work environment and sociopsychologically disadvantageous work characteristics.[26] Most non-permanent jobs have poorer work conditions that require long working hours and overtime work, which are associated with subjective health status and sociopsychological health deterioration.[27] We anticipate that workers with disabilities with precarious jobs are more likely to experience a harmful work environment than those with permanent jobs and that unstable employment is associated with poor self-rated health.

Income also is a significant factor in sustaining good health.[21–23] Income affects housing, neighbourhood environments, diet, access to facilities for exercise and healthcare, which can all affect health.[28] People with lower incomes are more likely to experience stress from social and psychological deprivation, which has a detrimental impact on health.[23] We hypothesised that waged workers with disabilities receiving high incomes are better able to afford benefits in health, whereas low-income workers with disabilities have difficulties to afford it and are more likely to have poor health. Furthermore, the association between employment status and self-rated health would also differ based on the income level. Therefore, the purpose of this study was to examine the association of employment status and income with self-rated health among waged workers with disabilities in South Korea, using data designed for reporting on employment status among the disabled. We also explored the association between employment status and self-rated health according to the income level.

METHODS

Data source

This study used the 2011–2015 Panel Survey of Employment for the Disabled (PSED). The PSED includes panel data from repeatedly measured households, including people with disabilities, and provides useful data for understanding the economic activities of people with disabilities related to their employment.

People with disabilities were individually interviewed in the PSED. Because the structure and contents of these data are more complex compared with cross-sectional data, this survey used a computer-assisted personal interviewing method to perform 'logic checks' to identify inconsistent or contradictory responses. The PSED only allowed the head of the household or the legal guardian to reply if an intellectual disability or a mental disorder limited a direct response.

Study sample

The PSED used a systematic stratified cluster sample of households for this study. The sample was stratified by 15 metropolitan cities and provinces in South Korea, age (15–60 and 61–75 years) and type of disability. The sample size was calculated based on a proportional distribution using the area and the type of disability according to the two age groups. While the first wave of the PSED started in 2008, control variables such as smoking and drinking were not surveyed from the first to the third wave (2010) but were maintained thereafter. This study included data from the fourth wave starting in 2011, in which 4397 subjects completed the survey questionnaire. These respondents were waged workers aged ≥20 years. Subjects aged ≥60 years in 2011 were excluded so that all subjects in this study were aged <65 years during the 5-year follow-up. A total of 951 waged workers remained in this study through the 5-year period.

Variables

Data regarding self-rated health were extracted from responses to the question 'How do you usually think about your general health status?' Four possible responses were available: excellent, good, poor and very poor. We created a dummy variable by treating it as 0 for excellent or good and 1 for poor or very poor.

The main independent variables in this study were employment status and income, measured each year from 2011 to 2015. Employment status in waged workers was classified into two categories: full-time permanent positions and precarious positions. Precarious employment was defined as those who are temporary workers or daily employed workers. Income was operationalised as household income.

This study reviewed a few previous studies for self-rated health and included the following control variables: sex (men or women); age (20–39, 40–49 and ≥50 years); education level (elementary school, middle or high school, and above college); marital status (married, single, divorced or separated); head of the household (yes or no); having a chronic disease (yes or no); drinking (yes or no); smoking (yes or no); severity of disability (severe or mild); and type of disability (physical disability, sensory disability, mental disorder or disability of internal organs). Previous studies suggest that the following factors were indicative of poor self-rated health reporting: female,[11] older age,[11] low education level,[11] married,[11] head of the household,[29] having chronic diseases,[11] smoker,[9] non-drinker,[9] severe disability[30] and non-mental or internal organ disability compared with physical disability[11] were more likely to report poor self-rated health. Thus, we posit the predicted signs for our control variables as follows. Women would be more likely to report poor health than men. Workers with disabilities aged ≥40 years would be more likely to report poor health than those aged 20–39 years. Compared with those who

graduated college or above, people with disabilities with lower education levels would be more likely to report poor health. Single, divorced or separated workers with disabilities would be more likely than married workers with disabilities to report poor health. Being the head of the household would be associated with poorer health. Those who have chronic diseases would be more likely than those without to report poor health. Drinkers would be less likely than non-drinkers to report poor health, whereas smokers would be more likely than non-smokers to report poor health. Those with a severe disability would be more likely to be associated with poor health than those with a mild disability. Compared with workers with a physical disability, those with a sensory, non-mental or internal organ disability would be more likely to report poor health.

Statistical analysis

Differences between workers with disabilities with poor self-rated health and those with good self-rated health based on categorical variables were determined by performing χ^2 tests. To identify factors associated with self-rated health and to examine the impact of employment status and income on self-rated health, this study used the generalised linear mixed model (GLMM) to incorporate repeated measures over time and both fixed and random effects. The GLMM combines the theories of generalised linear models and generalised linear mixed effects models for repeated measures data analysis. The OR was calculated through the regression coefficient gained through the model and was presented with the 95% CI. The SAS V.9.4 statistical package was used for data analysis.

Patient and public involvement statement

Neither patients nor the public was involved in this study.

RESULTS

General characteristics of study subjects

Table 1 shows the general characteristics of the study population from the PSED data. Overall, 951 people were included in the analysis, and 374 of 951 (39.3%) reported poor self-rated health in the baseline year (2011). Among the general characteristics, a statistically significant difference in self-rated health was found in terms of sex, age, education level, marital status, head of household status, income, employment status, chronic disease, smoking and type of disability. Health status was better among men, younger participants, single participants, those with a higher education level, non-heads of the household, those with higher income, those with a permanent employment status, those without a chronic disease or mental disorder, and non-smokers. This study also shows the general characteristics of the study population by employment status and income level, which is an independent variable in our study (online supplementary tables 1 and 2).

Association between employment status and income with poor self-rated health

Table 2 shows results of factors associated with poor self-rated health after adjusting for sex, age, education level,

Table 1 General characteristics of the study subjects (2011)

			Self-rated health			
	Total		Good		Poor	
Variables	n	%	n	%	n	%
Total	951	100.0	577	60.7	374	39.3
Sex						
Men	693	72.9	445	64.2	248	35.8
Women	258	27.1	132	51.2	126	48.8
Age (years)						
20–39	181	19.0	139	76.8	42	23.2
40–49	310	32.6	211	68.1	99	31.9
≤50	460	48.4	227	49.3	233	50.7
Education level						
Elementary school	236	24.8	108	45.8	128	54.2
Middle or high school	551	57.9	363	65.9	188	34.1
Above college	164	17.2	106	64.6	58	35.4
Marital status						
Married	611	64.2	376	61.5	235	38.5
Single	164	17.2	119	72.6	45	27.4
Divorced or separated	176	18.5	82	46.6	94	53.4
Head of household						
Yes	688	72.3	400	58.1	288	41.9
No	263	27.7	177	67.3	86	32.7
Income						
Q1 (lowest)	168	17.7	87	51.8	81	48.2
Q2	155	16.3	79	51.0	76	49.0
Q3	142	14.9	91	64.1	51	35.9
Q4	194	20.4	122	62.9	72	37.1
Q5 (Highest)	292	30.7	198	67.8	94	32.2
Employment status						
Permanent	425	44.7	287	67.5	138	32.5
Precarious	526	55.3	290	55.1	236	44.9
Chronic disease						
Yes	351	36.9	132	37.6	219	62.4
No	600	63.1	445	74.2	155	25.8
Drinking						
Yes	337	35.4	201	59.6	136	40.4
No	614	64.6	376	61.2	238	38.8
Smoking						
Yes	611	64.2	387	63.3	224	36.7
No	340	35.8	190	55.9	150	44.1
Severity of disability						
Severe	687	72.2	412	60.0	275	40.0
Mild	264	27.8	165	62.5	99	37.5
Type of disability						

Continued

Table 1 Continued

Variables	Total		Self-rated health			
			Good		Poor	
	n	%	n	%	n	%
Physical disability	585	61.5	344	58.8	241	41.2
Sensory disability	283	29.8	182	64.3	101	35.7
Mental disorder	47	4.9	35	74.5	12	25.5
Disability of internal organs	36	3.8	16	44.4	20	55.6

marital status, head of household status, chronic disease, drinking, smoking, severity of disability and type of disability. Men with disabilities were more likely to have poor self-rated health than women (OR 1.82, 95% CI 1.80 to 1.83). People aged ≥50 years and 40–49 years were 1.96 and 1.15 times more likely to have poor self-rated health, respectively, than younger people (20–39 years). People with an elementary school or below education were more likely to have poor self-rated health than those who graduated college (OR 1.15, 95% CI 1.13 to 1.16). Divorced or separated respondents were 1.05 times more likely to have poor self-rated health than married people. Those with a head of household status had a higher possibility of poor self-rated health than those who were non-heads of household (OR 1.27, 95% CI 1.26 to 1.29), and the lowest income group was 1.81 times more likely to have poor self-rated health than the highest income group. Precarious workers were 1.22 times more likely to have poor self-rated health than permanent workers. Those with a chronic disease were more likely to have poor self-rated health than those without (OR 3.16, 95% CI 3.14 to 3.19). Drinkers and smokers were 0.91 and 1.39 times more likely to have poor self-rated health than non-drinkers and non-smokers, respectively. People with a severe disability were more likely to have poor self-rated health than those with a mild disability (OR 1.12, 95% CI 1.11 to 1.13). Respondents with sensory disabilities, mental disorders and internal organ disabilities were 0.78, 0.56 and 1.73 times more likely to have poor self-rated health, respectively, than those with physical disabilities.

Association between employment status and poor self-rated health by income level

After adjusting for the control variables, table 3 shows the results of the association between employment status and poor self-rated health according to income level. Precarious workers were more likely to have poor self-rated health than permanent workers in the Q1 (lowest) (OR 1.33, 95% CI 1.31 to 1.35), Q2 (OR 1.15, 95% CI 1.13 to 1.17), Q3 (OR 1.15, 95% CI 1.13 to 1.17) and Q4 (OR 1.08, 95% CI 1.06 to 1.09) income groups. Precarious workers were less likely to have poor self-rated health

Table 2 Factors associated with poor self-rated health

Variables	Poor self-rated health			SE	P value
	OR*	95% CI			
Sex					
Men	1.00				
Women	1.82	1.80	1.83	0.005	<0.001
Age					
20–39	1.00				
40–49	1.15	1.13	1.16	0.006	<0.001
50≤	1.96	1.94	1.99	0.006	<0.001
Education level					
Above college	1.00				
Middle or high school	0.69	0.68	0.69	0.005	<0.001
Elementary school	1.15	1.13	1.16	0.006	<0.001
Marital status					
Married	1.00				
Single	0.97	0.96	0.99	0.006	<0.001
Divorced or separated	1.05	1.04	1.06	0.005	<0.001
Head of household					
No	1.00				
Yes	1.27	1.26	1.29	0.005	<0.001
Income					
Q5 (Highest)	1.00				
Q4	1.40	1.39	1.41	0.005	<0.001
Q3	1.54	1.53	1.56	0.005	<0.001
Q2	1.50	1.49	1.52	0.005	<0.001
Q1 (Lowest)	1.81	1.80	1.83	0.005	<0.001
Employment status					
Permanent	1.00				
Precarious	1.22	1.21	1.23	0.003	<0.001
Chronic disease					
No	1.00				
Yes	3.16	3.14	3.19	0.003	<0.001
Drinking					
No	1.00				
Yes	0.91	0.90	0.92	0.004	<0.001
Smoking					
No	1.00				
Yes	1.39	1.38	1.40	0.004	<0.001
Severity of disability					
Mild	1.00				
Severe	1.12	1.11	1.13	0.004	<0.001
Type of disability					
Physical disability	1.00				
Sensory disability	0.78	0.77	0.78	0.004	<0.001
Mental disorder	0.56	0.55	0.57	0.008	<0.001

Continued

Table 2 Continued

Variables	Poor self-rated health				
	OR*	95% CI		SE	P value
Disability of internal organs	1.73	1.70	1.76	0.009	<0.001

*Adjusted for sex, age, education, marital status, head of household, income, employment status, chronic disease, smoking, drinking, severity of disability and type of disability.

than permanent workers in the Q5 (highest) income group (OR 0.93, 95% CI 0.92 to 0.95).

DISCUSSION

The primary purpose of this study was to investigate the association of employment status and income with self-reported health among waged workers with disabilities in South Korea. Our study had four major findings: first, 39.3% of workers with disabilities reported poor self-rated health; second, precarious workers were more likely to have poor self-rated health than permanent workers; third, those in the lowest income category were more likely to have poor self-rated health than those with the highest income; finally, the phenomenon that the self-rated health of precarious workers is worse than that of permanent workers gradually increased as income decreased. The anticipated trends between the other control variables (sex, age, education level, marital status, head of household, having a chronic disease, drinking, smoking, severity of disability and type of disability) and self-rated health were consistent with findings reported in previous studies.

People with disabilities experience employment disparities that limit their income, security and overall quality of work life. Employees with disabilities exhibit similar organisational commitment and turnover intention as those without disabilities, yet receive lower pay, job security, flexibility and more negative treatment by management and have lower job satisfaction. The lower satisfaction is a result of lower job security, less job flexibility and more negative views of management and coworker relations.[31] Furthermore, precarious workers face working conditions that negatively affect their health more than those with permanent employment. Previous studies in several countries have concluded that working conditions are more hazardous and occupational injuries happen more frequently among precarious workers.[32–34] A favourable work environment and high job security lead to better health outcomes. Being employed with appropriate working conditions is protective against adverse physical health and psychiatric disorders.[35] Precarious workers are less satisfied with their jobs and, most significantly, are concerned with job security. It is well established that a perception of chronic job insecurity, as well as actual job insecurity, can have harmful effects on health.[36 37]

Additionally, our results made clear that wages played an important role in self-rated health; the hourly wage of precarious workers was just 64% of what permanent workers make in South Korea, which is markedly lower than that in other Organisation for Economic Cooperation and Development member countries.[15] Although low-income precarious workers were more likely to have poor health than permanent workers, there is no difference between high-income precarious workers and high-income permanent workers. This result implies that income is an important indicator for poor self-rated health. Insufficient use of healthcare services by low-income precarious workers may be the cause of poor self-rated health. In previous Korean studies, people with disabilities experienced more barriers in accessing medical services due to economic burden despite needing services more frequently than the general population.[38 39] Because people with disabilities are more vulnerable to disease than the general population, it is important to consider ways to improve the accessibility of medical services among precarious workers or low-income people with disabilities.

This study has a few limitations. First, the measurement of health status was subjective and could be subject to information bias. Second, the actual prevalence of chronic diseases is likely higher than that reported in our data, because some conditions may not have been diagnosed at the time of the survey. We also did not consider the types of chronic diseases due to limited data. Because some chronic diseases may influence self-rated health but others may not, the results should be interpreted with caution. Finally, the results could possibly reflect reverse causality and bidirectional relationships regarding the association between the employment status and income with self-rated health.

Table 3 Association between employment status and self-rated health according to income

Income	Employment status	OR*	95% CI		SE	P value
Q1 (lowest)	Permanent	1.00				
	Precarious	1.33	1.31	1.35	0.010	<0.001
Q2	Permanent	1.00				
	Precarious	1.15	1.13	1.17	0.008	<0.001
Q3	Permanent	1.00				
	Precarious	1.15	1.13	1.17	0.009	<0.001
Q4	Permanent	1.00				
	Precarious	1.08	1.06	1.09	0.008	<0.001
Q5 (highest)	Permanent	1.00				
	Precarious	0.93	0.92	0.95	0.007	<0.001

*Adjusted for sex, age, education, marital status, chronic disease, smoking, drinking, severity of disability and type of disability.

CONCLUSION

This study suggests that waged workers with disabilities and precarious employment or low-income level are associated with poorer self-rated health than those with permanent jobs or high income. Our findings provide significant evidence explaining health inequalities among waged workers with disabilities. Information collected from monitoring the health status of waged workers with disabilities with precarious jobs or low-income levels

could help prioritise health policies for the disabled. Our findings may also contribute to supporting solutions for non-permanent jobs or poverty issues among people with disabilities from a health perspective.

Acknowledgements The English language in this document has been checked by at least two professional editors, both native speakers of English.

Contributors JC and THK designed the study concept, wrote the protocol and collected the data. JK and EH conducted the analyses. All authors helped in drafting the manuscript, and read and approved the final manuscript. All authors had full access to all data (including statistical reports and tables) in the study and take responsibility for data integrity and data analysis accuracy. JC and THK are the study guarantors.

Funding Research support by a grant from the National Research Foundation Korea (grant number 2019R1A2C1003259) is gratefully acknowledged.

Competing interests None declared.

Patient consent for publication Not required.

Ethics approval The authors obtained ethical approval for this research from the institutional review board of Yonsei University Graduate School of Public Health. Informed consent was waived by the board.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No data are available.

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