

Accidents resulting in disability in vulnerable populations and their consequences: A study of vulnerable worker groups in South Korea

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취약계층의 사고 후 장애 발생으로 인한 결과: 한국사회의 취약한 노동계층 중심으로

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Abstract This study aimed to identify worker groups that are to accidents and to track the changes in their socioeconomic status there after. We analyzed the Korean Labor and Income Panel Study (KLIPS) database(2001–2006) were recorded according to the participant’s economic activity status at the beginning of follow-up, and economic activity status was. During the follow-up period, the unemployed group experienced more accidents that resulted in disability than the economically active group. Interestingly, the unemployed group also had the highest industrial accident rate. Among the employed, daily and unpaid family workers were more vulnerable to disabilities. After the accidents, the participants tended to become economically inactive or unemployed. Compared to other worker groups, the economically inactive, unemployed, and daily and unpaid family workers experienced higher rates of accidents and faced graver conditions as a result. Although they constitute a significantly large part of society, these vulnerable workers are not currently covered by any social security measures, such as accident surveillance, training, and accident insurance. Social policy should therefore be directed toward protecting these vulnerable worker groups.

Key Words : Disability, Economic activity status, Employment status, South Korea, Vulnerable worker

요 약 이 연구는 근로자의 고용상태에 따라 사고 이후 사회경제적 상태에 어떠한 영향을 주는지 알아보기 위해 연구되었다.

노동패널(2001-2006) 자료를 이용하여, 2001년 근로자들의 경제활동 상태, 고용상태가 연구기간 내 어떻게 변화했는지 알아보았다. 추적관찰 동안, 경제활동 그룹에 비해 실직 그룹에서 사고로 인한 장애를 더 많이 겪은 것으로 나타났다. 더구나, 실직그룹에서 산업재해율도 가장 높았다. 고용 상태별로 보면, 일용직, 무임금 근로자들이 장애를 더 많이 겪은 것으로 나타났다. 또한 이들은 사고를 겪은 후, 비활동경제상태 또는 실직자가 되었다. 다른 근로자그룹과 비교해서 비활동경제 그룹, 실직자, 일용직, 무임금 가족근로자가 사고율도 높았는데 이는 결과적으로 이들의 사회경제적 상태를 더 악화시켰다.

주제어 : 장애, 경제활동상태, 고용상태, 한국, 취약집단

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1. Introduction

According to the World Health Organization[1], disability is defined as follows

"An umbrella term, covering impairments, activity limitations, and participation restrictions." An impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations[2].

People with disabilities arising from various types of accidents face many barriers to full participation in the labor market, which carries serious implications for their living standards and quality of life[2, 3]. Also, the caregiver who cares for the disabled also increases the physical burden over time[4]. Labor market flexibility as a demand of economic globalization has led to an increase in precarious employment patterns, such as informal, temporary, and part-time work. Its associated working conditions have been reported to affect an individual's health via a variety of pathways: for example, environment, exposure to hazardous materials, and risk of dismissal[5, 6].

Since the 1997 financial crisis in South Korea, labor market flexibility has led to important changes in employment patterns. The proportion of non-standard workers increased from 43% in 1996 to 55.8% in 2007[7, 8]. Furthermore, unstable employment markets have created further health risks associated with temporary employment. These health risks may depend on the instability of temporary employment, the unemployment rate, and the proportion of temporary employees within the country[9]. In addition, one year after a person becomes disabled, the employment rate remains well below what it was before the onset of the chronic illness or disability, and the inactivity rate is more than half of those affected, compared with the one-third that it was before the onset of disability[3].

This study aims to investigate which groups in the

labor market are vulnerable to accidents that lead to a disability. For vulnerable workers, these accidents can produce changes in socioeconomic standing and employment status throughout these people's lifetimes.

2. Methods

2.1 Study Design and Population

Data were derived from the Korean Labor and Income Panel Study (KLIPS). The KLIPS is an ongoing household-based population survey that has been conducted annually since 1998. The sample yield consists of 5,000 households and their members, 15 years of age or older, who reside in urban areas in Korea. The survey uses a two-stage cluster-sampling plan stratified by region and covering seven metropolitan cities and urban areas in eight provinces (excluding Cheju Island) in South Korea.

The KLIPS is comprised of answers to two sets of questionnaires: a "household" questionnaire and an "individual" questionnaire. The survey focuses on labor market characteristics as well as income, expenditures, education, job training, and the social activities of individuals. It is conducted through a face-to-face interview that is completed by a member of each household, who serves as a reference person, or the spouse.

In this study, individuals who were interviewed during both the 4th wave (2001) and the 9th wave (2006) were selected for the study sample (N = 8,535). To investigate the incidence of disability and its consequences on economic status, participants with disability at baseline (N=278) and those who had a disability before 2001(N=104) were excluded.

Thus, the final sample for this study was comprised of 8,153 men and women.

2.2 Variables

Disability was assessed using the question "Do you currently have any type of mental or physical disability?"

during both the 4th and the 9th waves of the KLIPS.

The state of economic activity is indicated by dividing the population into the “economically active population,” which includes both the employed and unemployed, and the “economically inactive population.” The former is the segment of the population that provided or was willing and able to provide labor for producing goods and/or service during the survey week. The unemployed refers to those who were not working, who had participated in job-seeking activities in the past week and would have worked in the past one week if a job had been available, and who did not undertake job-seeking activities in the past week but had done so within the past month and had been willing to work during the past week if an appropriate job had been available. The economically inactive population refers to those who were neither employed nor working and those who are not able to work or who were able to but were not willing to work.

The work status of a person’s main job was classified into five different types: permanent, temporary, daily, self-employed, and unpaid family worker. These categories were combined in regards to the worker’s accession of industrial accident compensation insurance (permanent/temporary or self-employed, daily/unpaid family worker).

The sociodemographic variables included gender, age (19 and below, 20 - 29, 30 - 39, 40 - 49, 50 - 59, and 60 and above), education (no education, high school and tertiary education), and monthly household income adjusted for household size, with an equivalence elasticity of 0.5.

2.3 Statistical Analyses

Descriptive statistics were used to describe the economic activity status of the study population according to being disabled and the risk of being disabled within the follow-up period by considering both their educational level and age strata.

Student’s t-test and the chi-square test were used to evaluate the demographic differences in disability

status during the following periods. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) for acquiring disability according to economic activity status and employment status were estimated using a generalized linear model with a binomial probability distribution and a logit link function. Likewise, the same model was used to determine economic inactivity in the 9th wave according to disability status and economic activity in the 4th wave.

3. Results

<Table 1> shows the changes in economic activity status by causes of disability during follow-up. According to the participant’s economic status at the beginning of follow-up (2001), the incidence of accidents was higher among the unemployed (4.1%) compared to the employed (2.1%) and to the economically inactive (2.8%). At the end of the study period, workers with a disability were more likely to be unemployed or economically inactive compared to the employed.

<Table 1> Changes in economic activity status according to the causes of the disability (2001-2006)

Changes in economic activity status		Proportion of workers with a disability		Total study population, N(%)
4th wave	9th wave	All cause of injury disease, N(%)	Occupational injury, N(%)	
Employed	Employed	45(1.2)	8(0.2)	3707(45.5)
	Unemployed	1(1)	0(0)	96(1.2)
Economically inactive	Economically inactive	51(6.4)	6(0.8)	796(9.8)
	Subtotal	97(2.1)	14(0.3)	4599(56.5)
Unemployed	Employed	3(3.5)	4(4.7)	85(1.0)
	Unemployed	1(8.3)	0(0)	12(0.2)
Economically inactive	Economically inactive	2(3.9)	0(0)	51(0.6)
	Subtotal	6(4.1)	4(2.7)	148(1.8)
Economically inactive	Employed	5(0.5)	2(0.2)	1048(12.9)
	Unemployed	3(3.4)	1(1.1)	88(1.1)
Economically inactive	Economically inactive	86(3.8)	2(0.1)	2270(27.8)
	Subtotal	94(2.8)	5(0.1)	3406(41.8)
Total		197(2.4)	20(0.2)	8153(100.0)

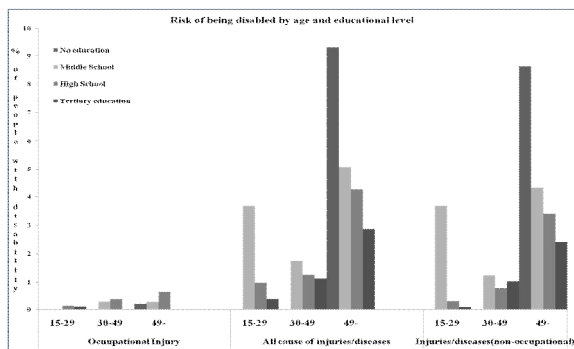
Among the employed <Table 2>, the proportion of persons with a disability was higher in the older age groups. In addition, daily and unpaid family workers with disabilities tended to have lower levels of education and a smaller monthly household income than permanent workers, temporary workers, and the self-employed.

<Table 2> Sociodemographic characteristics according to disability status (2001-2006) and employment status during the 4th wave

	Daily workers/ unpaid family workers		p-value	Permanent workers/ temporary workers/self-employed		p-value
	Without disabilities, N(%)	With disabilities, N(%)		Without disabilities, N(%)	With disabilities, N(%)	
Sex						
Male	219(31)	21(61.8)	0.0002 ^a	2408(63.5)	45(71.4)	0.1919 ^a
Female	488(69)	13(38.2)		1387(36.6)	18(28.6)	
Age						
≤19	2(0.3)	0(0)	0.0076 ^a	37(1)	0(0)	<0.0001 ^a
20 - 29	35(5)	0(0)		722(19)	2(3.2)	
30 - 39	140(19.8)	2(5.9)		1084(28.6)	11(17.5)	
40 - 49	247(34.9)	12(35.3)		1098(28.9)	14(22.2)	
50 - 59	147(20.8)	10(29.4)		575(15.2)	20(31.8)	
≥60	136(19.2)	10(29.4)		279(7.4)	16(25.4)	
Educational level						
No education	58(8.2)	3(8.8)	0.8377 ^a	68(1.8)	8(12.7)	<0.0001 ^a
High school	602(85.2)	29(85.3)		2428(64)	44(69.8)	
Tertiary education	47(6.7)	2(5.9)		1299(34.2)	11(17.5)	
Monthly household income(10,000 KRW)						
4th wave (M±SD)	84±66.4	76±46.5	0.4890 ^b	112±87	87.7±66.9	0.0297 ^b
9th wave (M±SD)	134.1±111	105.8±79.7	0.1418 ^b	183±203.8	140.9±113.9	0.1017 ^b

^a p-values were derived from the chi-square test.

^b p-values were derived from the student's t-test.



[Fig. 1] Risk of acquiring a disability by age and educational level.

[Fig. 1] shows the gradient for the risk of acquiring disability by educational level.

<Table 3> indicates that daily and unpaid family workers were more vulnerable to acquiring disabilities (daily workers or unpaid family workers: 4.6% permanent workers, temporary workers or the self-employed: 1.6%) and tended to be economically inactive or unemployed following accidents (daily workers or unpaid family workers: 58.8%; permanent workers, temporary workers or the self-employed: 50.8%).

<Table 3> Economic activity status in the 9th wave according to disability status during the 4th wave

Economic activity status of the 9th wave	Daily workers/unpaid family workers		Permanent workers/temporary workers/self-employed	
	Without disabilities, N(%)	With disabilities, N(%)	Without disabilities, N(%)	With disabilities, N(%)
Employed	530(75)	14(41.2)	3132(82.5)	31(49.2)
Unemployed	8(1.1)	0(0)	87(2.3)	1(1.6)
Economically inactive	169(23.9)	20(58.8)	576(15.2)	31(49.2)
Total	707(95.4)	34(4.6)	3795(98.4)	63(1.6)

We analyzed “disability” by economic activity and economic status in the 4th wave <Table 4>. The incidence of accidents that resulted in disability was higher among daily and unpaid family workers and the unemployed compared to permanent, temporary and self-employed workers. According to the adjusted odds ratios, the unemployed were the most vulnerable to suffering a disabling accident. Furthermore, the economically inactive group experienced a higher number of disabling accidents compared to permanent, temporary and self-employed workers.

<Table 5> shows the number of participants who were “economically inactive in the 9th wave” by disability status and by economic activity status in the 4th wave. People with a disability therefore experienced significantly more changes in their economic activity status.

<Table 4> Adjusted odds ratios and confidence intervals (95%) for disability status by economic activity/inactivity and employment status during the 4th wave

	OR (95% CI)
Permanent workers/ temporary workers/self-employed	1.00
Daily workers/unpaid family workers	2.34* (1.49 - 4.43)
Unemployed	2.94* (1.23 - 3.41)
Economically inactive	1.46* (1.00 - 2.73)

*p < 0.05

Adjusted for age, gender, and socioeconomic status (educational level and household income)

<Table 5> Adjusted odds ratios and confidence intervals (95%) for “being economically inactive” during the 9th wave by disability status and economic activity status during the 4th wave

	OR (95% CI)
Without disability	1.00
With disability	4.30* (2.93 - 6.30)
Employed during the 4th wave	1.00
Unemployed during the 4th wave	3.02* (2.04 - 4.45)
Economically inactive during the 4th wave	10.01* (8.86 - 11.30)

*p < 0.01

Adjusted for age, gender, and socioeconomic status (educational level and household income)

4. Discussion

This study focused on identifying which groups of workers had higher risks for accidents resulting in disability and whether acquiring a disability affects people in regards to their job status and socioeconomic status thereafter. This study suggests that the economically inactive group experienced disabling accidents at the same rate as the economically active group. However, the unemployed group suffered more accidents that resulted in disability. Thereafter,

especially among the economically inactive, unemployed, daily, and unpaid family workers, the consequences of disability produced a more insecure and dangerous economic status.

The participants of this study were covered under stratified systemic sampling from the KLIPS based on the Korean population and housing census. They are representative of workers and are likely to represent the status of Korean workers; 76% of them have been followed-up since 1997.

This study had some limitations. First, only answers to the survey question “Do you currently have any mental or physical disability?” were considered. This question was addressed to people who had an existing disability in both the 4th and 9th waves of the survey. Second, the KLIPS does not collect information on people who expect to recover from their temporary or physical disabilities during follow-up. Finally, determining whether an individual suffers from a long-term health problem and whether it is work-limiting is challenging and also subjective; there may be social and economic incentives for misreporting one’s disability status, which could have affected our results.

Generally, the economically inactive group is comprised of adolescents, those of retirement age, housewives, and people from the lower socioeconomic segment. These subgroups have experienced a higher incidence of unintentional accidents. The cumulative incidence rate (CIR) of unintentional accidents and the CIR of severe accidents in the daily life of Koreans were recorded at 17,606 and 286 per 100,000 persons, respectively, for one year[10]. Adolescents, the elderly, and those with a low income/economic status tend to report increased accident rates[10, 11]. Furthermore, since the national debt crisis, workers are experiencing a genuine threat to job security, and people with a disability or those with less education face even more disadvantages. In addition, the impact of disability on these labor markets is associated with employment and earnings.

Some previous studies have offered several potential explanations for these observed associations. First, because economically inactive groups spend most of their time at home, they are likely to experience accidents. The major mechanisms of accidents include slipping, contact, physical over-exertion, and falls[10]. Second, the higher risk of occupational accidents among workers with unstable jobs may be related to their greater inexperience and lack of induction and safety training in the workplace[12, 13]. Third, workers with disabilities experience discrimination when returning to work after an illness and have higher rates of involuntary job change[14]. Finally, acquiring a disability may well lead to an increased risk of poverty. Conversely, people who are already living in poverty may be even more susceptible to chronic illness/disability onset, as suggested by the extensive research literature on health inequalities[15]. Additionally, other factors such as age, gender, education, and skills may also affect those who report having a disability.

However, the types of accidents or the accidents themselves depend on a person's economic activity/inactivity and employment status. Nevertheless, the risk groups and risk settings for all kinds of accidents are the main factors that influence an increase in socioeconomic loss and also a decrease in the quality of human resources[16, 17]. Therefore, an increase in active governmental intervention is needed to ensure accident prevention. National employment protection and social security legislation are important factors when referring to "poor work" in relation to low wages, inadequate social security, job insecurity, and a lack of unionization and industrial safety. Another related issue involves underemployment and fragmentary work, which may result in an insufficient amount of time spent employed during an individual's work career[18, 19].

The issues mentioned above have received growing attention from policymakers; as a result, a range of legislative and other reforms aimed at securing

improvement in the labor market position of persons with disabilities has been introduced. However, these results also enable the key labor market in Korea to be identified, along with techniques that have been used to resolve them, and carry implications for the empirical results.

The increase in unemployment and job insecurity may soon influence the health of workers in the "flexible labor market." In particular, the economically inactive, unemployed, and daily and unpaid family workers are not covered by any social security measures such as accident surveillance, training, and accident insurance. Thus, these vulnerable groups typically cannot access occupational health surveillance, health and safety training, and work accident insurance. Therefore, future policies should focus on protecting workers from a vicious cycle of vulnerability and include clearer provisions in order to protect these particularly vulnerable workers.

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