

# An Analysis of the Association between Functional Limitation and Distress among Employees with Chronic Illness: Moderating Roles of Gender and Employment Status

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## Abstract

The social exclusion of people with health problems or disabilities has become a pressing issue in recent employment policies in many countries. In Japan, it has been reported that there is a lack of understanding and support systems in the workplace for employees with chronic illnesses. Past research found that chronic illnesses are associated with mental health problems and posited that the individual processes to adjust to received chronic illness diagnosis is dependent on contextual variables such as functional limitations caused by the illness, and sociodemographic characteristics such as gender, education, marital status, and occupation. This study examines the association between functional limitation and distress for Japanese employees with chronic illness, while testing the moderating effects of gender, firm size, and employment status, using nationally representative data. Results from logistic regression revealed that functional limitation is positively associated to distress for employees with chronic illnesses. It was also found that being female and working in a non-regular job strengthens the association between functional limitation and distress. The findings indicate that a disadvantaged position in the labor markets exacerbates the mental health for employees with chronic illnesses. In addition, the hours of work exhibited a positive effect on distress, implying the possibility of relationship between job demands and psychological distress. The present results suggest that employer effort to accommodate the needs of employees with chronic illnesses, such as management of work time,

may reduce the distress of employees with chronic illness.

## 1. Introduction

The social exclusion of people with health problems or disabilities has become a pressing issue in recent employment policies across many countries. According to Organisation for Economic Co-operation and Development (OECD), one in seven people of working age report chronic health problem or disability in OECD countries (OECD 2010: 22). Those people are disadvantaged in terms of employment and income. In the latter half of the 2000s, the average employment rate of the population with health problems or disabilities in OECD countries was 44% whereas that of their healthy counterparts was 75% (OECD 2010: 23). The relative poverty rate was 22% for people with health problems or disabilities, while it was 14% for healthy people (OECD 2010: 23). Consistent with these facts, in Japan, Yamada, Momose, and Shikata (2015) found that the poverty rate of people with disability was twice as high as that of healthy people.

Diversity literature in management research has revealed that employees with disabilities experience satisfaction with accommodations when they receive requested accommodation (Balser and Harris 2008), perceive discrimination and procedural injustice in experimental settings (Snyder *et al.* 2010), and experience lowered leader-member exchange (Dwertmann and Boehm 2016). Also, Dwertmann and Boehm (2016) revealed that the relationship between subordinates and

supervisors becomes worse if either one has a disability, inclusive workplace climates buffer the deterioration of the relationship only in the case where the supervisor has disability. However, in those studies, external context of organization has not been received much attention in these studies. As Shore *et al.* (2009) stated, factors outside of the organization (such as occupation, industry, and laws) play an important role in diversity in the organization. In order to bridge the gap between the organizational level and societal level research, the current study uses both illness-related factors and social structural factors to examine how these factors affect the distress of employees.

Difficulties caused by illness and difficulties caused by social disadvantages possibly combine to cause more serious problems. As Strass *et al.* (1984) revealed, chronic illness causes various problems in quality of life (QOL) such as problems in terms of related to controlling illness symptoms, adjustment to life changes, and monetary problems. These problems do not necessarily occur independently of each other but interact with one another. Livneh (2001) presented a model of the psychological adaptation to chronic illness and disability. In this model, the adaption process consisted of interconnected factors such as psychosocial reactions and contextual variables. Psychosocial reactions include personal attitudes to illness such as acceptance or denial. Contextual variables include factors associated with the illness itself, such as the type and severity of the symptoms, functional limitations, and the course of the conditions; factors associated with sociodemographic characteristics such as age, gender, education, marital status and occupation; factors associated with the external environment such as social isolation, economic and institutional support, living conditions, and the availability of job opportunities. On the other hand, it is well known that chronic illness and mental health problems are often comorbid. For example, having a chronic illness such as arthritis, asthma, cancer, heart disease, diabetes, hypertension, or chronic pain conditions significantly associates with having a mental disorder (Scott *et al.* 2007). Moreover, the comorbid state of a mental disorder

and physical disease worsens the health status and is related to absenteeism (Moussavi *et al.* 2007; Buist-Bouwman *et al.* 2005). Therefore, it is important to explore how these factors interact each other and affects QOL or the mental health of persons with chronic illnesses. This study examines whether sociodemographic characteristics such as gender or occupation moderate the association between functional limitations and psychological distress among employees with chronic illnesses.

## 2. Disadvantaged Situation of Employees with Chronic Illness

Many employees have chronic diseases in Japan. According to an estimate by the Ministry of Health, Labour and Welfare (URL 1), the number of working persons with diabetes is 2.1 million, stroke is 324 thousand, angina pectoris and myocardial infarction is 619 thousand, and cancer is 310 thousand. The current situation and problems are as follows. Ministry of Health, Labour and Welfare (URL 2) showed that the percentage of companies that employ persons who are on leave for more than a month due to their illnesses are 38% for mental health, 21% for cancer, and 12% for cerebrovascular disease. In addition, medical progress accomplished improvements in the workability of a person with chronic illness. For example, the 5-year relative survival rate of cancer patients increased from 53.2% to 58.6% in 1993-96 to 2003-05 (URL 2). However, the lack of understanding and support systems at the workplace makes it difficult to continue work. In fact, according to Ministry of Health, Labour and Welfare (URL 3), 16.2% of employees who were diagnosed with cerebrovascular disease, heart disease, musculoskeletal disease, cancer, and stress-related disease chose to quit their job. Moreover, about 30% of these people mentioned a lack of understanding in the workplace as a reason for leaving their job (URL 3). It is also said that about 8% of diabetic patients discontinued outpatient treatment because they were too busy at work (URL 2). In addition, according to The Japan Institute for Labour Policy and Training (2013: 89), the job

separation rate of employees who needed medical treatment due to illness tends to be higher for non-regular employees than for regular employees. As shown in Figure 1, when regular employees are sick, the job separation rate is 27.0% for mental health, 22.4% for cerebrovascular disease, and 20.7% for cancer, whereas for non-regular employee's the rate for mental health was 46.0%, 42.7% for cerebrovascular disease, 39.0% for cancer.

Results from public opinion polls revealed the disadvantaged situation that cancer patients are in when it comes to employment. According to the Cabinet Office (URL 4), in response to the question "Do you think that the current Japanese society is an environment where you can continue to work if you need to go to the hospital once every two weeks for cancer treatment and examination?", 65.7% of respondents answered "Somewhat I do not think so" or "I do not think so." Moreover, more women than men answered "Somewhat I do not think so" or "I do not think so". Respondents who answered "I do not think so" or "Somewhat I do not think so" to the previous question were also asked to select the reason for their work difficulties as a cancer patient. The reasons were as follows: "There are no people who work instead of me or it is hard to ask to cover my task" (response rate, 22.6%), "I do not

know if my employer will allow me to take a day off" (22.2%), "Because it is physically difficult to balance cancer treatment/examination and work" (17.9%), "Because it is mentally difficult to balance cancer treatment/examination and work" (13.2%), "Because taking a day off will reduce my income" (13.1%), and "Because my evaluation at work will be lowered if I take a day off" (8.8%). From these facts, it has been suggested that workplace concerns for cancer patients may be related not only to the symptoms of the illness itself, but also to how their workplaces attempt to accommodate the needs for employees with chronic illnesses.

### 3. Theoretical Backgrounds

#### 3.1 Chronic Illnesses in the Workplace

Several studies found that work-related problems due to chronic illness have a detrimental effect on employees' psychological state. Varekamp and van Dijk (2010) revealed the problems felt by employees with chronic illnesses in the workplace. Their samples were 122 employees who had the following illnesses: diseases of the musculoskeletal and connective tissues, diseases of the nervous

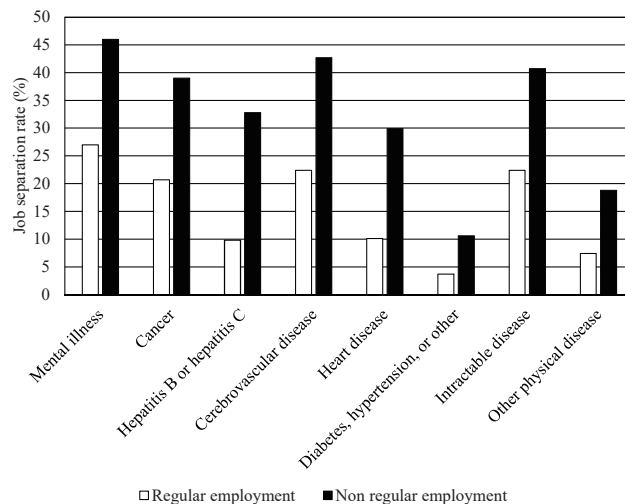


Figure 1. Job separation rate of employees with chronic illness

Note: Sample size of each illness is from 348 to 2,908.

Data source: The Japan Institute for Labour Policy and Training (2013: 89).

system, diseases of the digestive system, endocrine, nutritional and metabolic diseases, cancer, diseases of the respiratory system, and diseases of the cardiovascular system. They found that employees recognized a severe problem regarding items such as the “balance between work and life at home” (52%), “acceptance of having a disease” (46%), and also recognized a slight problem with “performing work tasks” (69%), “finishing my tasks” (48%) and “contact with colleagues” (41%). In addition, when comparing these 122 employee samples a non-chronic illness sample ( $n = 68,775$ ), employees with chronic illnesses reported significantly lower satisfaction and unfavorable social relations with their colleagues.

It is worth examining the idea that the distress of an employee with an illness may be triggered by the illness itself. Munir *et al.* (2007) revealed that the social situation related to illnesses has influence separate to that of the illness itself. The samples that were used were from employees working for public institutions or companies with musculoskeletal pain, arthritis/rheumatism, asthma, depression/anxiety, heart disease, and diabetes. As a result of the analysis, it was found that work limitation increased distress even after controlling for gender, education, the severity of the symptoms of chronic disease, and the number of chronic diseases, whereas support in the workplace decreased distress. This study showed that impaired role functioning, such as work limitations, is an important determinant of distress among employees with chronic illness. Consistent with this finding, an individual’s physical functioning affects their QOL in populations with chronic illnesses (Smith, Avis, and Assmann 1999), increasing functional limitation is negatively correlate with QOL over time in persons with Multiple Sclerosis (Stuifbergen *et al.* 2006), where the functional limitation refers to the restriction to carry out physical and mental activities in daily life (Verbrugge and Jetts 1994).

Qualitative studies showed a more detailed aspect of the experiences of having a chronic illness in the workplace. Beatty (2012) extracted the problem of carrier barriers from interviews with 12 employees with epilepsy and 11 employees with

multiple sclerosis. The barriers on the carriers they perceived were mainly twofold. The first barrier is the problems regarding symptoms of the illness itself and the second is those caused by the reaction of people around a person who has a chronic illness. The barriers arise from illness itself are that of the physical restrictions and constraints on cognitive abilities that affect job performance. For example, employees who have restrictions on memory due to epilepsy had difficulty learning on the job. On the other hand, a typical example of a barrier due to the reaction from the workplace is demotion without detailed explanation. Five of the interviewees with epilepsy reported that they were involuntarily demoted. For example, an employee was moved to another department after suffering a seizure in the workplace, and at that time, it was indicated that he would be fired if he refused to move. Beatty (2012) pointed out that these barriers would lower self-efficacy and transform attitudes towards careers. In Japan, Ito *et al.* (1998), using data from interviews with 21 adults with epilepsy, of which 9 are company employees or self-employed, found that persons with epilepsy often face misunderstanding and prejudice when they disclose their illness.

### 3. 2 Conservation of Resources Theory, Labor Markets, and Gender

The conservation of resources theory (COR theory) explains the process in which a disadvantaged social situation causes distress in a person with chronic illness. According to Hobfoll (1989), stress is caused by a threat to the resources of an individual that he or she thinks is important, and the amount of resources that the individual originally owned mitigate that threat. Examples of resources in the workplace mentioned by Hobfoll (2001) are support from colleagues, employment status, stable employment, opportunities for training, and understanding from supervisors/employers. Similarly, personal or other characteristics such as self-control, motivation, an independent spirit, optimism, and economic stability and health are listed as resources. In addition, the cognitive activation theory of stress of Meurs and Perrewé

(2011), a model that integrates COR theory and the cognitive appraisal theory of Lazarus and Folkman (1984), explains the process as follows. When individuals encounter a potentially stressful event, they do not perceive it as a stressor if they have resources to control it, but recognizes the event as a stressor if they do not have resources to deal with the event. Given these resources-based stress theories, it can be thought that resources have a buffering effect on the relationship between potential stressors and their outcomes. Especially, for those with chronic illnesses, appropriate or poor workplace accommodations may weaken or strengthen relationship between illness-related potential stressors such as functional limitation and distress. Indeed, as mentioned earlier, Munir *et al.* (2007) revealed that workplace support decrease distress in employees with chronic illness. Although Munir *et al.* (2007) did not examined the moderation effect, this is thought to be the effect of support in the workplace by increasing the resources of employees with chronic illness.

Based on Hobfoll (2001) mentioning stable employment as a resource, people in unstable employment can be considered to be under threat of resource loss. Those who work for small companies, hold non-regular employment, and are female are considered to be in relatively unstable employment situations. The dual labor market theory explained that the labor market is divided into a primary market (internal labor market) with good working conditions and a secondary market (external labor market) without such conditions, poor learning opportunities and unstable employment (Doeringer and Piore 1971). In Japan, it has been said that which labor market an employee belongs to depends mainly on the size of the company (Ishikawa and Dejima 1994). Nakazawa (2008) compares the period of continuation of work between large-scale companies and small-sized companies. The results showed that people working for large companies continued to work longer than people who work for small companies. According to Hara (2007), it was revealed that large companies have more vocational ability development programs than small companies. Meanwhile, there are also studies that

state that the division of regular employment and non-regular employment is arising as a new dual labor market (Keizer 2008). Consistent with these studies, as mentioned earlier, The Japan Institute for Labour Policy and Training (2013: 89) show higher retirement rates in non-regular employees with chronic illness. Moreover, the proportion of institutionalization of sick leave system was higher in large companies than small companies (The Japan Institute for Labour Policy and Training 2013: 31-2). Given these findings, the company size and employment type, as variables representing the amount of resources available to employees, may moderate the relationship between having an illness and distress. Furthermore, recent studies in management research found that perceived job insecurity arise from temporary employment (Keim *et al.* 2014). Job security, defined as “a perceived threat to the continuity and stability of employment as it is currently experienced”, is considered to have a negative effect on employees’ well-being through mediating stress related mechanisms (Shoss 2017).

Gender inequality is still prominent in the labor markets of Japan. Among the OECD countries, Japan’s gender wage gap is large, and the proportion of female managers is small (Estévez-Abe 2013). Furthermore, as Tsutsui (2016) argued, the recent expansion of employment of women in Japan is explained by the increase in women with non-regular employment and increasing age at which women get married. Given the large gender gap in Japanese labor market, female employee may feel a greater crisis of resources if they suffer from a chronic illness. Based on these arguments, I developed the following hypotheses.

*Hypothesis 1:* Functional limitation positively associate with distress among employee with chronic illness.

*Hypothesis 2:* Being a female enhances the association between functional limitation and distress among employee with chronic illness.

*Hypothesis 3:* Non-regular employment enhances the association between functional limitation and distress among employees with chronic illness.

*Hypothesis 4:* Working for a small company

enhances the association between functional limitation and distress among employees with chronic illness.

The analytic frame is shown in Figure 2. Among employees with chronic illness, functional limitation may be associated with psychological distress, while female, non-regular employment, and working for a small company moderate its association.

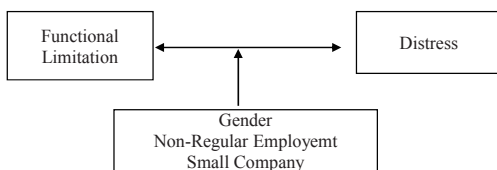


Figure 2. Analytic Frame

## 4. Method

### 4.1 Data

Data used in this study come from the 2010 Comprehensive Survey of Living Conditions (CSLC), a large-scale national survey conducted by the Ministry of Health, Labour and Welfare (MHLW). A stratified survey was conducted to a randomly selected sample of 228,864 Japanese households. CSLC 2010 consists of data from five questionnaires. The first and second questionnaires are concerned with respondents' household demographics and individual health conditions. These two questionnaires were distributed to households within the 5,510 areas that were extracted from the census survey areas. The third questionnaire is concerned with long term care of respondents or family members of respondents. This was administered in 2,500 areas that were extracted from the 5,510

Table 1. Sample characteristics

	n	%	mean	SD	min	max
Age class			11.6	2.0	5.0	17.0
Female	197	27.3				
married	578	80.2				
Education						
Junior high school or below	76	10.5				
High school	347	48.1				
Technical training school or junior college (ref= University or higher)	99	13.7				
Occupation						
Clerical	96	13.3				
Sales	54	7.5				
Service	113	15.7				
Manufacturing	63	8.7				
Other (ref= Administrative, managerial, professional and engineering)	129	17.9				
Tenure			19.4	14.4	0.0	50.0
Tenure(ln)			2.5	1.2	0.0	3.9
Working hour in 1 week			39.8	14.0	0.0	80.0
Working hour in 1 week(ln)			3.6	0.6	0.0	4.4
Household expenditure			27.8	15.7	3.0	100.0
Household expenditure(ln)			3.2	0.6	1.1	4.6
Stressor of illness	171	23.7				
Small-firm (< 300)	416	57.7				
Non-regular employment	256	35.5				
Functional limitation	135	18.7				
Psychological distress (k6 5 and above)	218	30.2				
Mood/anxiety disorder (k6 9 and above)	81	11.2				

Note: n=721. Working hours was top coded at 80. Tenure was top coded at 50. The household expenditure was top-coded at 55 for single households and 100 for 2 or more households. When working hours and tenure were converted to ln, 0 included in working hours and tenure were recorded as 1. Other occupations include agriculture, forestry, fishery, security, transport and machine operation, carrying, cleaning, packaging, construction and mining and not classifiable.

areas in which the household demographics and health questionnaires were conducted. The fourth and fifth are concerned with respondents' income and savings. These last two questionnaires were conducted in 2,000 areas that were extracted from the aforementioned 5,510 areas. The present study used resampled data from the household and the health questionnaires of CSLC 2010. Samples having the following characteristics were extracted for use from this resampled data according to the purpose of the analysis: being employed, over 15 years of age, currently not enrolled in school, being an outpatient due to one or more of the following illnesses: diabetes, heart disease, stroke, cancer, not being hospitalized, and not having mental illness. Respondents who have mental illness were excluded from sample because it likely to be highly associated to distress. Effective sample size for the present analysis is 721. Characteristics of the samples are shown in Table 1. The number of males was 594. Age was categorized in variables named age classes and replaces the five years age range between classes; for example, age class 4 represents the 15-19 years old and age class 5 represents the 20-24 years old. In this sample, the average age class value is 11.64 which approximates to early fifties. The number of respondents with diabetes, heart disease, stroke, and cancer was 477, 121, 51, and 108 respectively.

## 4. 2 Measurement

Psychological distress was measured with Kessler-6 (k6) scale designed to screen persons with mental health problems in the general population (Kessler, 2003). K6 consists of six items asking respondents how frequently they experienced symptoms of psychological distress. As sample question is: "During the past 30 days, how often did you feel nervous?" Response for individual question ranged from 0=never to 4=all of the time. A total range of the score was between 0 to 24. Higher score represents more serious mental problem. In the original version of K6, 13 and above is the optimal cut-off point for screening serious mental illness (Kessler 2003). For the Japanese version, several criteria have been proposed. Sakurai *et al.*

(2011) recommend 5 and above, while Furukawa *et al.* (2008) indicate 9 and above. Both of these criteria were proposed for screening to detect mood/anxiety disorder, but k6 and above can be used to detect psychological distress (Sakurai *et al.*, 2011). Following the use of Suzuki *et al.* (2013), the current study used both criteria; 5 and above as probable psychological distress and 9 and above as probable mood/anxiety disorder. By setting these two criteria, it is possible to know not only the association between functional limitation and psychological distress but also the seriousness of the problem. Functional limitation was measured by a questionnaire item asking respondents whether health problems affected their daily lives. Non-regular employment was measured using an item about respondents' employment status in the workplace. Part-time (including so-called *part* and *albeit*), temporary employees dispatched by staffing agencies (*haken-shain*), and contractors (*keiyaku-shain* and *shokutaku*) were coded as non-regular employment. A regular employee was used as a reference category. As to firm size, companies consisting of less than 300 employees were coded as a small, while those consisting of more than 300 employees and government agencies were used as a reference category.

## 4. 3 Analytic procedure

In the present analysis, a series of logistic regressions were conducted to test the hypotheses. The dependent variables are psychological distress ( $k6 \geq 5$ ) and mood/anxiety disorder ( $k6 \geq 9$ ). The independent variable is functional limitation. Moderators are female, small company, and non-regular employment. Age, marital status, education, occupation, household expenditure, weekly work hours, tenure, and stressor of illness were statistically controlled. Weekly work hours were measured by question item that asking respondents to answer total work hours of a specific week which is before the survey was conducted. Stressor of illness was measured by question item asking respondents whether they experience worries or stress in daily lives. Their causes were indicated

in multiple answer forms. The answer “own illness or long-term care” chosen as a cause of worry or stress was coded as a stressor of illness. After controlling for these variables, this study tested main effect of variables in step 1 of logistic regression. Then in step 2, using an interaction term, moderation effect of female and other two variables was separately tested because of the following theoretical prediction. According to health selection hypothesis, persons with poor health increase downward mobility of occupation (Blane 1985). Recently, Kröger (2016) found that the effect of health selection is observed especially in female employees but not in male. Based on these study,

it was assumed that being female employee with functional limitation could be associated with being non-regular employee with functional limitation or being employee with functional limitation in small company. Therefore, interaction between functional limitation and female was tested separately with other two interactions which include interaction between functional limitation and small company, functional limitation and non-regular employment.

## 5. Results

As shown in Tables 2 and 3, functional limitation

Table 2. Results of logistic regression for psychological distress (k6 5 and above)

	Step1		Step2			
	B	SE	B	SE	B	SE
<b>Control</b>						
Age class	-.16**	.05	-.16**	.05	-.15**	.05
Married	-.24	.23	-.25	.23	-.24	.23
Household expenditure(ln)	-.13	.18	-.13	.18	-.11	.18
Education						
Junior high school or below	.42	.36	.41	.36	.35	.37
High school	.12	.23	.12	.23	.11	.23
Technical training school or junior college (Ref. = University or higher)	.28	.30	.25	.31	.25	.31
Occupation						
Clerical	-.44	.29	-.42	.29	-.36	.29
Sales	.15	.34	.16	.34	.21	.34
Service	-.75*	.31	-.72*	.31	-.74*	.31
Manufacturing	-.20	.35	-.19	.35	-.10	.35
Other (Ref= Administrative, managerial, professional and engineering)	-.03	.28	-.03	.28	.01	.28
Tenure(ln)	-.10	.09	-.10	.09	-.12	.09
Working hour in 1 week(ln)	.29	.18	.31	.18	.35	.19
Stressor of illness	.97**	.21	.98**	.21	.99**	.21
<b>Predictor</b>						
Functional limitation	.91**	.23	.69**	.27	.47	.35
Female	-.12	.23	-.29	.26	-.09	.24
Non-regular employment	.15	.24	.15	.25	-.16	.27
Small-firm (< 300)	-.34	.19	-.34	.19	-.35	.21
<b>Interaction</b>						
Female x ADL limitation			.72	.47		
Non-regular employment x ADL limitation					1.28**	.47
Small-firm (< 300) x ADL limitation					-.02	.44
Intercept	.55	1.10	.53	1.11	.22	1.13
Nagelkerke R <sup>2</sup>						
	.17		.17		.18	
-2 Log Likelihood						
	792.60		790.19		784.70	
	91.13(18)**		93.54(19)**		99.03(20)**	
$\chi^2(df)$						
			2.41(1)		7.90(2)*	

\*\*  $p < .01$ , \*  $p < .05$



positively associated to psychological distress ( $B = .91, p < .01$ ), and positively associated to mood/anxiety disorder ( $B = 1.03, p < .01$ ). Thus hypothesis 1 was supported. For the direct effect of a moderator, Table 3 showed that non-regular employment has a positive association to mood/anxiety disorder ( $B = .77, p < .05$ ). Statistically significant interactions were confirmed between functional limitation and non-regular employment, as well as between functional limitation and gender. Table 2 showed that interaction between functional limitation and non-regular employment is positively associated to psychological distress ( $B = 1.28, p < .01$ ). Table 3 showed that interaction between

functional limitation and the female category is positively associated to mood/anxiety disorder ( $B = 1.43, p < .05$ ). The association between functional limitation and distress disappeared when the interaction of women and non-regular employment significantly affected distress. Thus, in the model of step 2, hypothesis 1 was not supported, while hypotheses 2 and 3 were supported. Hypothesis 4 was not supported because no significant association was observed in the interaction between functional limitation and small-firm.

Table 3. Results of logistic regression for mood/anxiety disorder (k6 9 and above)

	Step1		Step2			
	B	SE	B	SE	B	SE
<b>Control</b>						
Age class	-.21**	.08	-.21**	.08	-.21**	.08
Married	-.37	.31	-.42	.31	-.38	.31
Household expenditure(ln)	-.43	.26	-.46	.26	-.42	.26
Education						
Junior high school or below	.59	.51	.56	.51	.59	.51
High school	-.06	.35	-.06	.35	-.06	.35
Technical training school or junior college (Ref. = University or higher)	.28	.42	.21	.42	.28	.42
Occupation						
Clerical	-.60	.42	-.57	.43	-.57	.42
Sales	-.42	.53	-.42	.53	-.41	.53
Service	-.98*	.47	-.97*	.48	-.98*	.47
Manufacturing	-.19	.47	-.20	.48	-.17	.47
Other (Ref= Administrative, managerial, professional and engineering)	-.23	.40	-.27	.41	-.23	.40
Tenure(ln)	.01	.13	.01	.13	.01	.13
Working hour in 1 week(ln)	.74*	.34	.85*	.35	.77*	.35
Stressor of illness	.75*	.29	.81**	.30	.75*	.29
<b>Predictor</b>						
Functional limitation	1.03**	.30	.54	.37	.81	.45
Female	.01	.33	-.48	.40	.02	.33
Non-regular employment	.72*	.36	.77*	.36	.64	.40
Small-firm (< 300)	-.35	.28	-.35	.28	-.44	.32
<b>Interaction</b>						
Female x ADL limitation			1.43*	.60		
Non-regular employment x ADL limitation					.23	.58
Small-firm (< 300) x ADL limitation					.27	.55
Intercept	-1.17	1.79	-1.35	1.79		
Nagelkerke R <sup>2</sup>						
		.17		.18		.17
-2 Log Likelihood						
		443.34		437.47		442.87
		63.37(18)**		69.24(19)**		63.83(20)**
$\chi^2(df)$						
				5.87(1)*		.47(2)

\*\*  $p < .01$ , \*  $p < .05$

## 6. Conclusion

Although diversity research has thus far focused on the effects of a single dimension such as sex, race, age, and disability, the current study made a contribution to the field by revealing that combinations of attributes that relate to disadvantaged social conditions cause serious problems. Indeed, gender and employment status strengthened the association between functional limitation and distress. Consistent with COR theory, these findings indicate that a disadvantageous position in the labor market exacerbates the mental health for employees with chronic illnesses.

The results also showed that combinations of disadvantageous position associate with different outcomes. Although interaction between functional limitation and non-regular employment was associated with psychological distress, interaction between functional limitation and female was associated with mood/anxiety disorder. It indicated that female employees face more serious psychological problems than non-regular employees among employees with chronic illness and functional limitation. Role conflict may be another mechanism of stress explaining this difference. According to Kahn *et al.* (1964), role conflict is caused by two different demands which are difficult to carry out at the same time. Reduced work ability due to functional limitation may be potential cause of role conflict because it makes difficult for employees to manage multiple tasks. Working women in Japan are doing more non-paid work in home than men because of the norm of sexual division of labor (Tsutsui 2016). As functional limitation reduces the ability to perform tasks in both work and home, female employees with functional limitation face higher psychological problems because they face role conflict in both work and home domains. Nonetheless, it should be noted that robustness of these results has limitation. It was not clarified why interaction between functional limitation and female was associated with only mood/anxiety disorder, but not with psychological distress. The potential factors may be attributed to relatively small sample size. In the future studies, it is necessary to increase

sample size to examine this point.

This study targeted people with chronic illness. However, it was unclear whether the association between functional limitation and distress occurs only in people with chronic illness. In this regard, Gunn *et al.* (2012), using sample containing both people with and without chronic illness ( $n=7,620$ ), showed that the relationship between functional limitation and having chronic illness was strong. According to Gunn *et al.* (2012), the proportion of persons with functional limitation in those who do not have chronic illness was 0%, but the proportion of persons with functional limitation was 28.57% in those who have one chronic illness, 40.24% in those who have two chronic illnesses, 59.32% in those who have three chronic illnesses, 71.98% in those who have four chronic illnesses, 71.34% in those who have five chronic illnesses. In addition, the proportion of people who do not have chronic illness but have depression tendency was 16.44%, whereas the proportion of people who have chronic illness and depression tendency was 40.88%. Based on these findings, Gunn *et al.* (2012) argued that having illness affect the depression tendency and this relationship is mediated by functional limitation. Thus, functional limitation and having chronic illness is strongly related and this relationship is important for psychological distress. Consistent with Gunn *et al.* (2012), current study found that functional limitation is associated to psychological distress in persons with chronic illness.

In addition, results showed that longer hours of work increased distress. This indicates that factors such as amount of job demands may be related to the distress for employees with chronic illnesses. As Munir *et al.* (2007) showed, workplace factor such as social support would be important to those employees' well-being. Future research should examine the linkage between gender and employment status and social relationships in the workplace among persons with chronic illnesses.

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