

## Socioeconomic Influences on Women's Self-Rated Health Status in Japan

Eri Osawa<sup>1\*</sup>, Tomoko Kodama Kawashima<sup>1</sup>, Satoshi Tsuboi<sup>2</sup>, Etsuji Okamoto<sup>1</sup> and Hiroko Miura<sup>1</sup>

<sup>1</sup>Department of International Health and Collaboration, National Institute of Public Health, Saitama, Japan

<sup>2</sup>Department of Public Health, Jichi Medical University, Japan

### Abstract

**Introduction:** Epidemiological studies have amply documented the association between socioeconomic status (SES) and health, and have highlighted a gender gap in self-rated health status. However, few studies have investigated the health status of women in Japan. Therefore, using nationally representative data, we aimed to examine the association between SES and self-rated health in women in Japan.

**Methods:** We used data from the Comprehensive Survey of the Living Condition of People conducted by the Ministry of Health, Labour and Welfare in 2010. From the original database, we drew a sample aged from 20 to 59 years old (n=26,468) and measured variables related to household, income/savings, medication, and self-rated health. Data were analyzed using a multivariate logistic regression model.

**Results:** The highest prevalence of self-rated poor health was found in both unemployed women and men (15.7% and 23.2%, respectively). The regression model indicated that unemployed women aged over 40 years (and especially aged between 40 and 44 years) were more likely to report poor health (adjusted odds ratio (95% confidence interval): 2.48 (1.28-4.82), p<0.01) and having never married (1.82 (1.36-2.42), p<0.001).

**Conclusion:** The findings indicate that unemployed women are more likely to report poor health than employed women and that age over 40 and marital status could predict self-rated poor health. We recommend promoting community-based and workplace-based preventive health services. In younger women, it is recommended that work opportunities are promoted along with an appropriate social welfare regimen to improve health among women in Japan.

**Keywords:** Women; Health inequality; Self-rated health; Socioeconomic status; Economically inactive; Gender gap; Japan

### Introduction

Health inequalities related to socioeconomic status (SES), occupation, income, and educational attainment have been well documented recently in both Western countries and Japan [1-3]. Epidemiological studies have identified SES and health inequalities in mortality, morbidity of physical and mental illness [4-8], self-rated health [9,10], and health risk behaviors [11,12], and consistently show that people with higher SES have lower morbidity and mortality from various diseases and health problems compared with those of lower SES [4-12]. Work has beneficial long-term effects and the majority of people in healthy and safe work live longer than those out of work [13]. There is evidence that unemployment is associated with poor health [14-18] and that its impact on health is mediated by poverty, financial anxiety, stigma, and social isolation [14].

The Commission on Social Determinants of Health (CSDH) of the World Health Organization (WHO) defined the conceptual framework for social determinants of health (SDH). The framework distinguishes 'structural determinants' that include social and political mechanisms generating the socioeconomic position and 'intermediate determinants' that include material circumstances (e.g., living and working conditions, food availability), lifestyle and biological factors, psychosocial factors, and the healthcare system. It also shows the capacity of the health sector to influence not only the health outcomes in different people, but also differences in exposures and vulnerability [19].

Kondo et al. found a higher risk of poor health in unemployed people than in managerial workers and a marginal increase in the odds ratios (ORs) of poor health among younger people during the Japanese economic crisis [20]. Women in precarious employment living in single-parent households tend to suffer from poorer health [21]. There is global evidence of SES inequalities between women and men [22] and of a gender gap in self-rated health status [23,24]. However, few studies

have investigated the health status of Japanese women. Therefore, we aimed to examine the association between SES and self-rated health of women in Japan using a nationally representative survey.

### Methods

#### Data

This cross-sectional study used data from the Comprehensive Survey of the Living Conditions of People (CSLC) conducted by the Ministry of Health, Labour and Welfare (MHLW) in Japan in 2010. The regular survey, including a household and income/savings questionnaire, is conducted every year. A larger survey including a health and long-term care questionnaire is conducted every 3 years.

The CSLC is designed to reflect a representative cross-sectional sample using multi-stage stratified cluster sampling. In the 2010 CSLC, 5,510 enumeration districts (ED) of the census were randomly selected for household and health questionnaires, and 2,000 area units under the 5,510 EDs were randomly selected for income and saving questionnaires. The target survey population was 289,363 households (about 750,000 household members) for the household questionnaire and an individual-based health questionnaire. From these, 27,225 households were targeted for the household-based income and savings

**\*Corresponding author:** Eri Osawa, Senior Researcher, Department of International Health and Collaboration, National Institute of Public Health, 2-3-6 Minami Wako-shi, Saitama 351-0197, Japan, Tel: +81-48-458-6239; Fax: +81-48-469-2768; E-mail: [eriosawa@niph.go.jp](mailto:eriosawa@niph.go.jp)

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questionnaire. All households and household members, excluding individuals who were institutionalized, were approached to complete the questionnaires. The valid household response rate was 79.0% for the household and individual-based health questionnaire and 72.6% for the household-based income and savings questionnaire [25].

Subjects aged 20-59 years with a valid response for three questionnaires (household, health, and income and savings) were the study targets for the current analyses (n=26,468). We created an original ID for each participant from each ID of the ED and household, individual year, month of birth, and sex, and used this to link each participant's data. Subjects with the same birth date and sex from the same household (i.e., twins) could not be recognized individually, and were excluded from the analysis.

## Measurements

Self-rated poor health was the outcome measure. Self-rated health is a widely used measure and is strongly associated with wellbeing [26], mortality [27], and morbidity [28]. In the CSLC, self-rated health is assessed using a single question, 'What is your current health condition?' An answer is selected from five categories: excellent, very good, good, fair, and poor. The variable was dichotomized, with 'poor' and 'fair' responses labeled as 'poor health' in this study.

The independent variables were employment status, marital status, annual household income, and educational attainment. Employment status was categorized as: 1) in regular employment; 2) executive manager; 3) self-employed; 4) contracted worker; 5) other employment; or 6) unemployed (this category included participants

who were economically inactive, i.e. not actively seeking work). Marital status was categorized as: 1) married; 2) never married; 3) bereaved; or 4) divorced. Annual income before tax, including benefits and inheritances, was recorded. Annual household income was equalized by dividing by the square root of household size to account for differences in household size [28]. The study population was grouped into income quintiles. Educational attainment was categorized as: 1) university; 2) graduate school; 3) high school; and 4) junior high school or less. Age was divided into 5-year intervals. Analyses were adjusted for the covariate of consultation at a healthcare facility.

## Statistical analysis

We first examined the prevalence of poor health according to the independent variables and covariates. Spearman's correlation coefficients and crude ORs with 95% confidence intervals (CIs) were calculated using simple logistic regression to estimate the bivariate association among independent and outcome variables. Adjusted ORs (AORs) with 95% CIs for self-rated poor health were calculated using the forced entry method in a multivariate logistic regression by gender. The effects of the predictive variables on the outcome were explored for unemployed women. All statistical tests were two-sided, and  $p < 0.05$  was considered significant. IBM SPSS version 22.0 (IBM Corp., Armonk, NY, USA) was used for the analysis.

## Results

Table 1 shows that participants aged 55-59 years comprised the largest group (15.8%; 16.0% for women, 15.6% for men), followed by participants aged 35-39 years (15.1%; 14.4% for women, 15.8% for

Variable		Women				Men				Total			
		N	%	n	%	N	%	n	%	N	%	n	%
Overall		13,754		1,678	12.3	12,714		1,359	10.7	26,468		3,046	11.5
Age(year)	Mean ± SD	42.1 ± 10.9				42.1 ± 10.7				42.1 ± 10.8			
	20-24	854	6.2	71	8.3	710	5.6	45	6.3	1,564	5.9	116	7.4
	25-29	1,307	9.5	125	9.6	1,187	9.3	94	7.9	2,494	9.4	219	8.8
	30-34	1,674	12.2	174	10.4	1,492	11.7	143	9.6	3,166	12.0	317	10.0
	35-39	1,983	14.4	231	11.6	2,004	15.8	172	8.6	3,987	15.1	403	10.1
	40-44	1,980	14.4	259	13.1	1,801	14.2	178	9.9	3,781	14.3	437	11.6
	45-49	1,889	13.7	260	13.8	1,737	13.7	221	12.7	3,626	13.7	481	13.3
	50-54	1,863	13.5	264	14.2	1,796	14.1	238	13.3	3,659	13.8	502	13.7
	55-59	2,204	16.0	303	13.7	1,987	15.6	268	13.5	4,191	15.8	571	13.6
Marital Status													
	Married	9,685	70.4	1,190	12.3	8,518	67.0	901	10.6	18,203	68.8	2,091	11.5
	Never Married	3,027	22.0	341	11.3	3,736	29.4	405	10.8	6,763	25.6	746	11
	Bereaved	240	1.7	27	11.3	67	0.5	8	11.9	307	1.2	35	11.4
	Divorced	802	5.8	129	16.1	393	3.1	45	11.5	1,195	4.5	174	14.6
Household structure													
	With partner	1,731	12.6	223	12.9	1,366	10.7	161	11.8	3,097	11.7	384	12.4
	With partner and child(ren)	5,219	37.9	656	12.6	4,805	37.8	497	10.3	10,024	37.9	1,153	11.5
	Single	633	4.6	81	12.8	952	7.5	130	13.7	1,585	6.0	211	13.3
	With child(ren)	593	4.3	95	16.0	73	0.6	8	11.0	666	2.5	103	15.5
	With parent(s)	1,129	8.2	128	11.3	1,548	12.2	169	10.9	2,677	10.1	297	11.1
	Others	4,449	32.3	504	11.3	3,970	31.2	394	9.9	8,419	31.8	898	10.7
Employment status*													
	Employed	9,700	70.6	1,051	10.8	11,825	93.1	1,153	9.8	21,525	81.4	2,204	10.2
	Regular employed	6,576	47.9	692	10.5	8,689	68.4	823	9.5	15,265	57.7	1,515	9.9
	Executive manager	363	2.6	42	11.6	999	7.9	101	10.1	1,362	5.1	143	10.5
	Self employed	1,042	7.6	124	11.9	1,539	12.1	160	10.4	2,581	9.8	284	11.0
	Contract	1,420	10.3	158	11.1	446	3.5	53	11.9	1,866	7.1	211	11.3
	Others	299	2.2	35	11.7	152	1.2	16	10.5	451	1.7	51	11.3
	Unemployed (including house-wives/husbands)	4,040	29.4	636	15.7	885	7.0	206	23.2	4,925	18.6	842	17.1

Annual household income** (Range)													
	Quintile 5 (534.51+ )	2,698	19.6	303	11.2	2,655	20.9	250	9.4	5,353	20.2	553	10.3
	Quintile 4 (391.01-534.50)	2,756	20.0	301	10.9	2,653	20.9	244	9.2	5,409	20.4	545	10.1
	Quintile 3 (288.69-391.00)	2,705	19.7	307	11.3	2,579	20.3	279	10.8	5,284	20.0	586	11.1
	Quintile 2 (196.31-288.68)	2,752	20.0	335	12.2	2,491	19.6	254	10.2	5,234	19.8	589	11.2
	Quintile 1 (<=196.30)	2,843	20.7	441	15.5	2,336	18.4	332	14.2	5,179	19.6	773	14.9
Education Attainment***													
	University	1,986	14.7	206	10.4	3,864	31.0	368	9.5	5,850	22.5	574	9.8
	Graduate school	110	0.8	16	14.5	404	3.2	40	9.9	514	2.0	56	10.9
	High school	10,732	79.6	1,314	12.2	7,325	58.7	802	10.9	18,057	69.6	2,116	11.7
	Primary/Junior high school	656	4.9	125	19.1	876	7.0	129	14.7	1,532	5.9	254	16.6
Consulting a health care facility****													
	Yes	4,315	31.9	1,043	24.2	3,449	27.5	773	22.4	7,764	29.8	1,816	23.4
	No	9,226	68.1	619	6.7	9,094	72.5	571	6.3	18,320	70.2	1,190	6.5

Missing data is \*18, \*\*9, \*\*\*515, \*\*\*\*384

\*\*\* 10000 Yen , Adjusted for household size with equivalence elasticity=0.5

Table 1: Characteristics of the subjects stratified by gender and prevalence of self-rated poor health.

Variables	Women				Men			
	Adjusted OR	95%CI		p-value	Adjusted OR	95%CI		p-value
<b>Age</b>								
20-24		Ref				Ref		
25-29	1.11	0.80	1.53	0.540	1.38	0.93	2.04	0.112
30-34	1.11	0.81	1.53	0.515	1.76	1.21	2.57	<0.01
35-39	1.29	0.94	1.76	0.109	1.52	1.05	2.21	<0.05
40-44	1.47	1.08	2.01	<0.05	1.62	1.11	2.36	<0.05
45-49	1.55	1.13	2.13	<0.01	2.00	1.38	2.90	<0.001
50-54	1.36	0.99	1.87	0.057	1.94	1.33	2.82	<0.01
55-59	1.08	0.79	1.49	0.616	1.72	1.18	2.50	<0.01
<b>Marital Status</b>								
Married		Ref				Ref		
Never married	1.13	0.96	1.33	0.135	1.07	0.91	1.25	0.398
Bereaved	0.70	0.45	1.09	0.111	1.15	0.53	2.48	0.730
Divorced	1.21	0.97	1.50	0.095	0.87	0.62	1.22	0.428
<b>Employment status</b>								
<b>Employed</b>								
Regular employed		Ref				Ref		
Executive manager	1.12	0.79	1.61	0.524	1.10	0.88	1.38	0.411
Self employed	0.98	0.79	1.23	0.892	0.96	0.79	1.16	0.667
Contract	0.97	0.80	1.18	0.749	1.27	0.92	1.74	0.149
Others	0.95	0.65	1.38	0.775	1.04	0.61	1.79	0.882
Unemployed (including housewives/husbands)	1.44	1.27	1.64	<0.001	2.22	1.82	2.73	<0.001
<b>Annual household income</b>								
Quintile 5		Ref				Ref		
Quintile 4	0.99	0.83	1.18	0.898	1.02	0.84	1.24	0.822
Quintile 3	1.05	0.87	1.26	0.607	1.35	1.11	1.64	<0.01
Quintile 2	1.16	0.97	1.39	0.105	1.22	1.00	1.49	<0.01
Quintile 1	1.43	1.19	1.71	<0.001	1.51	1.24	1.85	<0.001
<b>Education attainment</b>								
University		Ref				Ref		
Graduate school	1.37	0.76	2.47	0.288	1.17	0.82	1.67	0.400
High school	1.07	0.90	1.26	0.447	1.12	0.97	1.29	0.112
Primary/Junior High School	1.44	1.10	1.89	<0.01	1.29	1.02	1.63	<0.05

\*Adjusted by consulting a health care facility

Table 2: Multivariate logistic regression results for self-rated health by gender.

men). Of the total, 68.8% were married and about one quarter had never married. About 37% of women and men lived with a partner and one child or more. Women were more likely to be single parents (living only with children) than men. More women than men were unemployed (29.4% and 7.0%, respectively). Regarding educational attainment, 69.6% of the study population had attended high school. However, there was a difference in the numbers of women and men

who had attended high school and university. Of the sample, 29.8% had consulted a healthcare facility (31.9% for women and 27.5% for men) during the survey period.

Table 1 also shows the prevalence of self-rated poor health stratified by gender. More women than men reported poor health (12.3% and 10.7%, respectively). The prevalence increased with age for both women and men; women aged 50-54 years reported poor health the most

Variables	Unemployed (including housewives)						Employed					
	n	%	Adjusted OR	95%CI		p-value	n	%	Adjusted OR	95%CI		p-value
Age												
20-24	13	9.4	Ref				58	8.1	Ref			
25-29	48	13.4	1.71	0.86	3.40	0.128	77	8.1	0.93	0.64	1.35	0.695
30-34	73	12.6	1.45	0.74	2.85	0.280	101	9.2	1.02	0.70	1.47	0.925
35-39	84	12.4	1.50	0.77	2.93	0.231	147	11.3	1.23	0.86	1.77	0.251
40-44	107	18.6	2.48	1.28	4.82	<0.01	152	10.8	1.12	0.78	1.61	0.539
45-49	80	19.6	2.45	1.24	4.83	<0.05	180	12.2	1.23	0.86	1.77	0.256
50-54	94	18.7	2.09	1.07	4.10	<0.05	170	12.5	1.10	0.76	1.59	0.622
55-59	137	17.0	1.64	0.84	3.18	0.146	166	11.9	0.87	0.60	1.27	0.465
Marital Status												
Married	491	14.2	Ref				699	11.2	Ref			
Never married	105	23.8	1.82	1.36	2.42	<0.001	236	9.1	0.90	0.74	1.09	0.284
Bereaved	11	17.5	0.76	0.36	1.64	0.490	16	9	0.69	0.40	1.17	0.169
Divorced	29	33.0	1.59	0.96	2.64	0.075	100	14	1.15	0.90	1.47	0.257
Annual household income												
Quintile 5	75	13.0	Ref				228	10.8	Ref			
Quintile 4	95	12.9	1.04	0.74	1.48	0.811	206	10.2	0.99	0.80	1.22	0.913
Quintile 3	116	13.8	1.21	0.86	1.70	0.268	191	10.3	1.02	0.82	1.26	0.891
Quintile 2	142	15.9	1.60	1.14	2.23	<0.01	193	10.4	1.01	0.81	1.26	0.936
Quintile 1	208	21.0	1.81	1.31	2.52	<0.001	233	12.6	1.23	0.99	1.53	0.066
Education attainment												
University	63	11.8	Ref				143	9.9	Ref			
Graduate school	3	13.6	1.21	0.32	4.50	0.779	13	14.8	1.39	0.72	2.67	0.328
High school	504	16.1	1.15	0.85	1.55	0.370	810	10.7	1.01	0.83	1.24	0.908
Primary/Junior High School	58	20.9	1.10	0.71	1.70	0.671	67	17.7	1.67	1.19	2.36	<0.01

\*Adjusted by consulting a health care facility

**Table 3:** Multivariate logistic regression results for women's self-rated health by employment status.

(14.2%). The prevalence of self-rated poor health by employment status varied from 10.5% to 15.7% for women and 9.5% to 23.2% for men. The highest prevalence for both women and men was in unemployed participants (15.7% and 23.2%, respectively).

Table 2 shows AORs for the reporting of poor health in relation to SES variables. We decided to exclude household structure because it was highly correlated with marital status and showed no statistical significance in the simple logistic regression analysis. Unemployed women and men were significantly more likely to report poor health. However, men showed higher AORs (95% CIs) (2.31 (1.90-2.80),  $p < 0.001$ ) than women (1.44 (1.27-1.64),  $p < 0.001$ ). There was an association between self-rated poor health and income among women earning the lowest annual household income (¥1,963,000 or less); for men, there was a significant association with annual household income up to the middle-income group. There was no significant association between marital status and self-rated poor health for either males or females.

Table 3 shows the result of multivariate logistic regression according to employment status among women. Unemployed women over 40 years were significantly more likely to report poor health (AOR (95% CI): 2.48 (1.28-4.82),  $p < 0.01$  for 40-44 years; 2.45 (1.24-4.83),  $p < 0.05$  for 45-49 years; and 2.09 (1.07-4.10),  $p < 0.05$  for 50-54 years). The prevalence was greatest in those aged between 45 and 49 years and decreased gradually. The prevalence of self-rated poor health among unemployed men was greatest in those aged 45-49 years and then decreased sharply in older age groups (Figure 1). Unemployed women who had never married reported significantly more poor health (AOR (95% CI): 1.82 (1.36-2.42),  $p < 0.001$ ). Lower annual household income

was associated with poor health in unemployed women (AOR (95% CI): 1.81 (1.31-2.52),  $p < 0.001$  for those earning the lowest income (¥1,963,000 or less) and 1.60 (1.14-2.23),  $p < 0.01$  for those earning the second lowest income (from ¥1,963,100 to ¥2,886,800). In contrast, among employed women, final educational attainment of primary or junior high school solely predicted a higher risk of self-rated poor health (AOR (95% CI): 1.67 (1.19-2.36),  $p < 0.01$ ).

## Discussion

Using nationally representative survey data, this study examined the association between SES and self-rated health in 2010 in a Japanese population. We found that women were more likely to report poor health than men. However, the findings indicate that, for both men and women, unemployed participants (including those who were not actively looking for work) were more likely to report poor health than those who were employed. This result is consistent with findings from previous studies conducted in Western countries [16-18]. In the current study, unemployment conferred a smaller risk for poor self-rated health in women compared with men. Several studies have shown that, among unemployed people, women experience poorer health status than men [15,29,30].

Our findings may reflect the complex nature of the study population. The unemployed group in this study included economically inactive people. Economic inactivity refers to people who are not looking for a job and is different from unemployment [31]. The unemployment rate in 2010 in Japan was 4.8% for women and 5.3% for men. However, the rate of unemployment in this study was 29.2% for women and 7.5% for men. This large difference for women may indicate that more women than

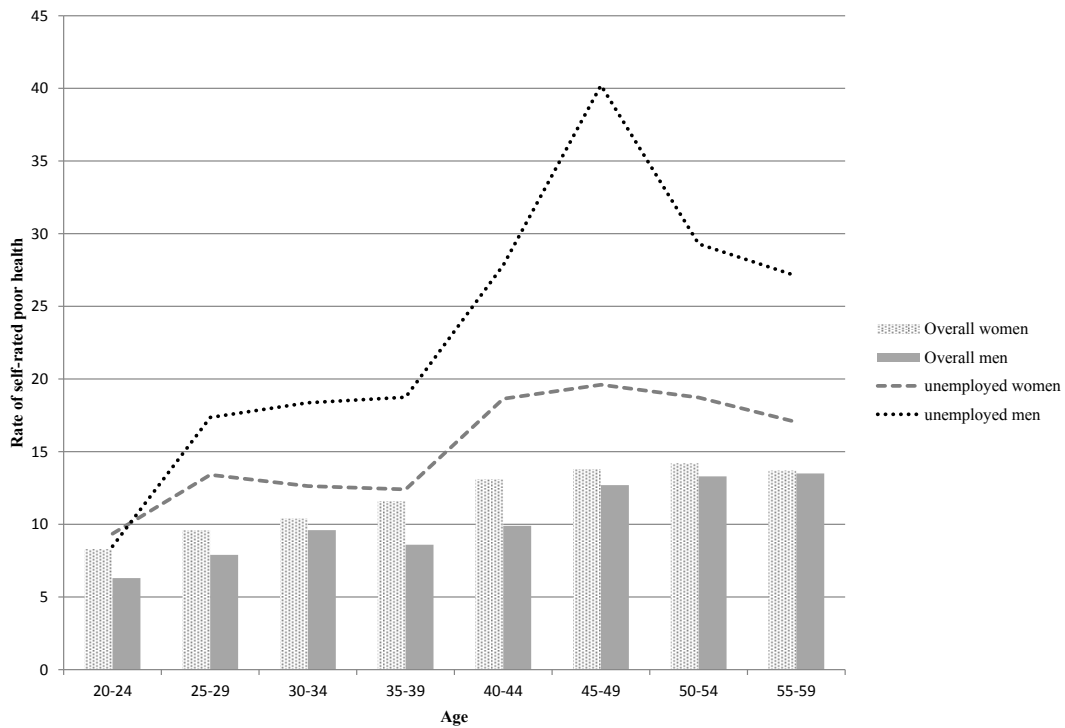
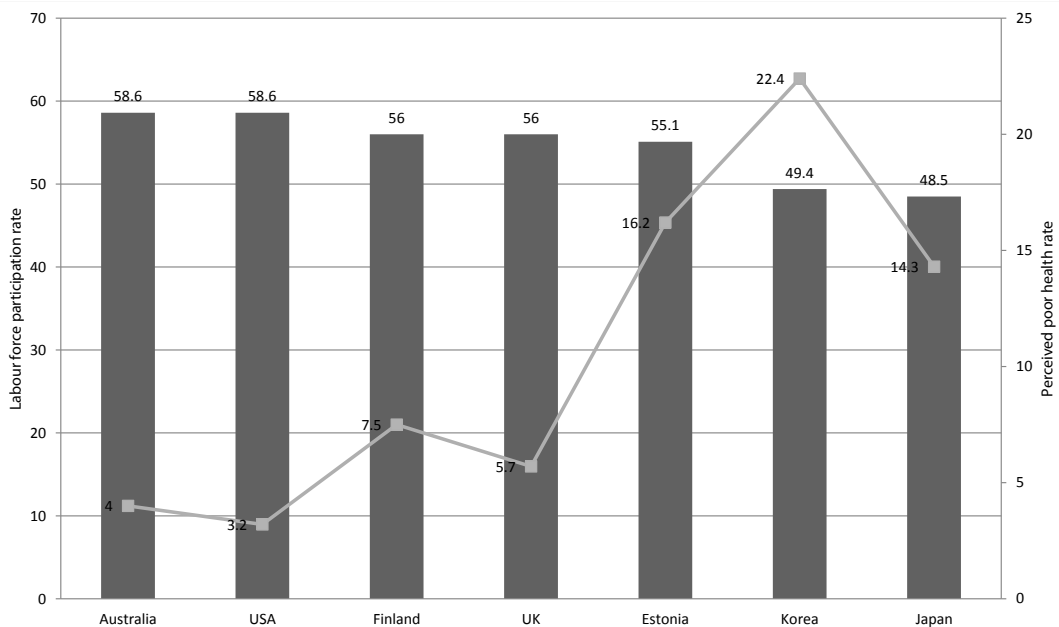


Figure 1: Rate of self-rated poor health among women and men by employment status.



\* Perceived poor health rate in Australia and USA was from 2011 and 2012, respectively and were deviated from OECD definition. Data of Labour force participation rate is from ILO ILOSTAT database (<http://www.ilo.org/global/statistics-and-databases/lang-en/index.htm>). Data from OECD library website (<http://www.oecd-ilibrary.org/statistics>).

Figure 2: Comparison of female Labour force participation and perceived poor health among seven countries in 2010.

men are economically inactive. Women in Japan may be economically inactive because of their traditional role in caring for the home and family, a pattern reflected in some European countries [32]. A study by Dubikaytis et al. revealed differences in self-ratings of poor health in housewives in Russia (St Petersburg), Estonia, and Finland. Ratings of poor health for housewives in Finland and Estonia were greater than those for employed women. In contrast, housewives in Russia were less likely to rate their health as poor compared with employed women [9]. Honjo et al. found that self-rated mental health among Japanese female workers was greater than that among housewives and have suggested that this may be related to the various conflicts and benefits associated with the multiple social roles for women in Japanese culture [33].

Our results also indicate that unemployed women over 40 years old had a greater risk of self-rated poor health compared with employed women. This prevalence increased at age 40 but subsequently slightly decreased. Unemployment was associated with poor health of women over 40 years old; in contrast, unemployment was associated with poor health in men aged 45-49 years old. Possible explanations are the differences between women and men in social expectations for working, and the reasons for being unemployed. Another possibility is that employment conditions differ for males and females across generations [34,35].

Annual household income may be a predictor of self-rated health in unemployed women. This result is inconsistent with a previous study showing no association between household income level and self-rated mental health in housewives [33]; however, as income level can vary across geographical areas, the economic characteristics of subjects in this study may not be homogenous. In the current study, marital status was associated with self-rated health among unemployed, but not employed, women. Unemployed women without a partner may experience social isolation, which can lead to poor self-rated health [36].

According to a comparison of female labor force participation by the International Labour Organization and perceived poor health by the Organization for Economic Co-operation and Development among seven selected countries in 2010, there was a trend for rates of perceived poor health to decrease as female labor force participation rates increased (Figure 2) [37,38]. Perceived poor health (self-rated health) in women may be influenced by both labor conditions and cultural influences on female social roles.

To improve women's health, we recommend robust promotion of both community-based and workplace-based health strategies as an approach to influence the intermediate determinants in the framework of WHO's CSDH. For example, in Japan, health check-ups and consultations for those over 40 years old are provided by a public health insurer for employed people and their dependants, including housewives. However, the health check-up rate of dependants is only about 30% [39]. It is necessary to promote use of the system of health check-ups and consultations for dependants as a health service for unemployed women, especially housewives over 40 years of age. For unemployed women not covered by a workplace-based health check-up and consultation for a household member, the municipality should be responsible for expanding access to healthcare to improve the health status of these individuals.

However, the aforementioned strategy could still miss younger unemployed women. For the younger generation, we strongly recommend the promotion of work opportunities with an appropriate social welfare regimen as an approach to the structural determinants of SDH, along with an enhancement of preventive health services.

Strength of this study was our use of a large, nationally representative sample to examine the association between employment status and self-rated health, which improves the generalizability of the results. However, there are also some limitations. First, the cross-sectional design limits the inference of causality between employment status and poor health. Second, the unemployed group in this study included both unemployed people and economically inactive people because of limited use of disaggregated data in the CSLC managed by the MHLW. Third, the outcome variable was self-rated health and data on objective health conditions were not collected. However, self-rated health is considered a strong predictor of objective health outcomes, such as mortality or morbidity [26-28].

To improve women's health, more research is required on the association between women's health status and employment status, including unemployed people willing to work, those looking after home and family, and those with long-term illness, considering the influence of female labor participation and cultural factors on female social roles.

## Conclusions

We examined the association between SES and self-rated health in employed and unemployed women (including those who were not actively seeking work). This cross-sectional study using a nationally representative Japanese survey demonstrated that unemployed women were more likely to report poor health than employed women. Among unemployed women, age (over 40) and marital status (never married) predicted self-rated poor health. We recommend promoting community-based and workplace-based preventive health services. In younger women, it is recommended that work opportunities are promoted along with an appropriate social welfare regimen to improve health among women in Japan. More research is needed on the association between SES and women's health that takes into account female labor participation and cultural influences on female social roles.

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