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REGULAR ARTICLE

Association of income with symptoms, morbidities and healthcare usage among Japanese adults

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Abstract
Objectives Socioeconomic inequalities in healthcare services are major public health and healthcare concerns. We have examined the association of income with symptoms, morbidities and healthcare usage in a national sample of the Japanese population.
Methods For this study, data compiled on 21,929 men and 24,620 women from the Comprehensive Survey of the Living Conditions of People on Health and Welfare in 2007 were assessed. Among the survey respondents with symptoms, we compared the prevalences of symptoms and treatments and the number of respondents who received treatments for 16 groups of symptoms and disorders according to household income, from the highest to the lowest, using the relative index of inequalities (RII). The RIIs were computed by age groups [25–59 years (young group) and 60+ years (senior group)].
Results People with lower incomes had higher prevalences of symptoms and treatments for most of the disorders examined. The RIIs of symptoms and treatments were 1.19 [95% confidence interval (CI) 1.09–1.31] and 1.04 (95% CI 0.93–1.16) for the young group and 1.69 (1.53–1.87) and 1.51 (1.36–1.67) for the senior group, respectively. In terms of treatment prevalence among those with symptoms, the RII was not significantly lower than 1.0 except for a few disorders in the young group.
Conclusions Our results indicate that income inequalities can be related to the prevalences of various symptoms and morbidities in our Japanese sample population and that these inequalities were greater in the senior group than in the young group. Our results also suggest that lower income is not a substantial barrier to the use of healthcare services by older Japanese individuals, while it is related to lower healthcare usage by individuals of working age.

Keywords Health inequality · Socioeconomic factors · Income · Morbidity · Healthcare usage

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Introduction

Health inequalities and social determinants of health have recently been recognized as important public health and healthcare policy concerns [1, 2]. Numerous studies, particularly those conducted since the 1990s, have found evidence of socioeconomic inequalities in health [3, 4]. Mortalities, morbidities, self-rated health, and health-related behaviors are related to the socioeconomic status (SES) of individuals, as measured by factors such as income, educational attainment, and occupational class [3, 4]. Various studies carried out outside of Japan have reported an association between SES and various health issues, such as skin morbidity, allergic diseases, vision problems, and low back pain [5–8].

Studies of the Japanese population have also demonstrated socioeconomic inequalities in health [9]. Similar to other countries, lower SES is associated with poor health and health risk behaviors [10–12]. Fujino et al. [13] compared mortalities between populations with lower and higher levels of education in a cohort study and demonstrated that mortalities from cancers and external causes

were significantly higher among those with less education, while the risk of ischemic heart disease was marginally reduced in men with a lower educational level. Using a cross-sectional study design, Nishi et al. [14] found gradients in prevalence according to educational level for diabetes among men and for hypercholesterolemia among women, but not for hypertension. However, findings on the relationships of mortalities and morbidities with SES in Japan are limited to only a few diseases. Concrete evidence of the effects of socioeconomic inequalities on mortalities and morbidities is therefore lacking for the Japanese population.

Health inequalities are critically related to various factors intrinsic to the specific healthcare system, including health insurance [2]. Japan has one of the fairest healthcare systems in the world [15], and the Japanese population has been universally and comprehensively covered with health insurance since the 1960s [16, 17]. In countries without universal healthcare insurance coverage, such as the USA, specific segments of the population are confronted with barriers to healthcare access [18]. In addition to health insurance, the use of healthcare services depends on the amount of the personal contribution (co-payment), regional access to healthcare services, and individual characteristics, including SES and race [18, 19]. Given recent debates on increased social disparities [20, 21], it is worthwhile to discuss whether socioeconomic inequalities exist in healthcare usage in Japan.

The aim of this study was to elucidate the associations between income and morbidities and healthcare usage in Japan. For this purpose, we used data from a survey conducted on a national sample of the Japanese population. This survey included questions on household income and symptoms and treatments for various physical disorders and conditions.

Methods

Data from the 2007 Comprehensive Survey of the Living Conditions of People on Health and Welfare conducted by the Ministry of Health, Labour and Welfare [22] were used for these analyses. This survey began in 1986, and a large survey is conducted every 3 years (demographic, health, long-term care, income, and savings). In the 2007 survey, 5,440 Enumeration Districts (EDs) from among approximately one million EDs were randomly selected as target regions for the distribution of a survey questionnaire on demographic and healthcare issues. Interviewers visited all households within the selected areas using lists of households and approached all household members. The questionnaires included basic information on both the household and the individual regarding demographics, health, illness profiles, lifestyle, and other items. Moreover, 2,000 unit areas were randomly selected from the 5,400 EDs, and all households and household members were approached regarding the questionnaire items on income and savings. Microdata files from this survey were used in the present study with permission from the Ministry of Health, Labour and Welfare.

The total number of households sampled for basic information was 287,807, of which 36,285 were interviewed with regard to income and savings. The response rates were 80.1% ($N = 230,596$) for the basic information survey and 67.7% ($N = 24,578$) for the income survey. The number of the household members ranged from one to 13, with a mean (standard deviation, SD) of 2.7 (2.2).

The data on 21,926 men and 24,620 women over 25 years of age, whose basic and income data were surveyed and contained no missing data for variables, were used in this study. The detailed numbers and basic characteristics of the study subjects are shown in Table 1. Their mean (SD) age and household income was 55.3 (16.9) years and 6.5 (5.1) million yen, respectively.

Outcomes

Health outcomes were assessed on the basis of 16 groups of symptoms and treatments, as shown in Table 2.

The subjects were asked whether they had one or more of various symptoms represented by 41 items on the survey questionnaire and whether they had received outpatient treatment for one or more of 39 diseases and physical conditions. The treatments included not only those provided in medical facilities (hospitals and clinics) but also acupuncture and osteopathy. Cardiovascular disease (CVD) and related disorders (diabetes, dyslipidemia, hypertension, stroke and ischemic heart diseases) were not included among the symptoms.

Table 1 Basic characteristics of the study cohort in terms of sex, age, and household income

Characteristics	Men	Women	Total
Number of subjects			
Age <60 years (%)	13,303 (60.7)	13,843 (56.2)	27,146 (58.3)
Age ≥60 years (%)	8,623 (39.3)	10,777 (43.8)	19,400 (41.7)
Total (%)	21,926 (100.0)	24,620 (100.0)	46,546 (100.0)
Age (years, mean ± SD)	54.3 ± 16.4	56.2 ± 17.3	55.3 ± 16.9
Annual household income (million, mean ± SD)	6.6 ± 5.1	6.3 ± 5.1	6.5 ± 5.1

SD Standard deviation

Table 2 Classification of symptoms and disorders

Groups	Symptoms	Disorders
Ophthalmopathy	Dim vision, visual difficulty	Ophthalmopathy
Otopathy	Dizziness, buzzing, hearing difficulty	Otopathy
Rhinopathy	Nasal obstruction, nasal discharge	Cold, allergic rhinitis
Respiratory diseases	Cough and sputum, wheezing	Asthma, other respiratory diseases
Digestive diseases	Gastric heaviness and heartburn, appetite loss, abdominal and stomach	Diseases of stomach and duodenum
Dental diseases	Toothache, swelling and bleeding of gums, chewing difficulty	Dental diseases
Dermopathy	Eruption, itch	Atopic dermatitis, other skin diseases
Neck stiffness	Neck stiffness	Neck stiffness
Lumbago	Back pain	Lumbago
Arthropathy	Pain in limb joints	Arthritis, rheumatoid arthritis
Depression	General fatigue, sleeplessness, irritation	Depression
Diabetes	Not available	Diabetes
Dyslipidemia	Not available	Dyslipidemia
Hypertension	Not available	Hypertension
Stroke	Not available	Stroke
Ischemic heart diseases	Not available	Ischemic heart diseases

In addition to symptoms and treatments, we also examined the prevalences of treatments received by those with symptoms. For example, the percentage of those with ophthalmological symptoms who had and received ophthalmological treatment(s) for these symptoms was determined. This variable was considered to reflect access to and the use of healthcare services.

Analyses

The relationships between income and outcomes were assessed using the relative index of inequality (RII) [23, 24] and by comparing the association of income with symptoms, morbidities, and healthcare usage in two age groups: 25–59 years (young group) and ≥60 years of age (senior group). We focused on age groups because we assumed that the association under study is influenced by socioeconomic conditions, such as employment and personal contribution to the healthcare program, in addition to health status. The choice of 60 years of age as the cut-off age was deliberate. Although 65 years of age is used in general demographic statistics, and 70 years of age may also be suitable because the amount of the personal contribution to the healthcare system in Japan decreases from 20 to 10% for individuals aged >70 years, we chose 60 years as the provisional cut-off age in light of the decrease in employment rate among individuals older than 60 years.

RII is a commonly used measure of the extent to which the health outcome, such as disease and death, varies with SES or some other background variable [23, 24]. The determination of the RII first requires hierarchical order in a given variable, from high to low. Second, in order to apply regression analyses, each category must be quantified by assigning a relative position in the hierarchy with values between 0 and 1. The RII estimated from the regression analysis is interpreted as the risk, including the relative risk (RR) and the odds ratio (OR), of the notional highest (=1) compared with the notional lowest (=0) across the population.

According to the RII concept, we first divided the subjects into ten equal groups according to annual household income, the mean (SD) of which was 6.5 (5.1) million yen. The highest 10% of the population was given the relative income variable of 0.05, and the next highest 10% was assigned 0.15, while the lowest 10% was designated 0.95. We then estimated the odds ratios using logistic regression analysis with health outcomes (symptoms, treatments, and treatments received by those with symptoms) as the dependent variables and the relative income variable (0.05–0.95) as the independent variable, with adjustment for age (years) and sex. The fitness and significance of the models were examined by the Hosmer–Lemeshow test and the score test, respectively. The statistical package PASW Statistics 18 (SPSS, Chicago, IL) was used to perform the analyses.

Results

Table 3 shows the prevalences of symptoms, treatments, and the treatments received by those with symptoms.

For most of the symptoms and treatments, prevalences were higher in the senior than in the young group. In contrast, the prevalences of treatments received by those with symptoms differed minimally between the young and senior groups.

RIIs for the symptoms are shown in Table 4. With the exceptions of rhinopathy in both age groups and dermopathy in the young group, significant relationships were found between income and symptoms. Compared with the young group, the senior group had higher RIIs for all symptom categories. Total RIIs were 1.19 [95% confidence interval (CI) 1.09–1.31] for those <60 years of age and 1.69 (95% CI 1.53–1.87) for those aged ≥60 years. Most of the models showed a good fitness ($P \geq 0.05$) and significance ($P < 0.05$).

RIIs for treatment prevalences are shown in Table 5. For the young group, ophthalmopathy, respiratory diseases and depression had significantly higher RIIs, with depression showing the highest RII (4.67). The RII for dermopathy was significantly lower than 1.0 (0.71). For the senior group, with the exceptions of rhinopathy, dental diseases, and dermopathy, significant relationships were recognized between income and treatments. The senior group had higher RIIs than the young group for most of the treatment categories. In total, the RIIs were 1.04 (95% CI 0.93–1.16) for those <60 years of age and 1.51 (95% CI 1.36–1.67) for those aged ≥60 years. Some of the models did not show the goodness of fit, and the model of rhinopathy did not show the significance.

Table 6 shows RIIs for treatments received by those with symptoms. For the young group, significant negative relationships (RII < 1.0) were found for dental diseases and dermopathy, while a significant positive relationship (RII > 1.0) was recognized for depression. For the senior group, rhinopathy, respiratory diseases, neck stiffness, and lumbago showed significant positive relationships, and there were no negative relationships with treatment. Most of the model showed the goodness of fit, while some did not show the significance.

Table 7 shows the prevalences and RIIs of CVD-related diseases. With the exceptions of dyslipidemia, which

Table 3 Prevalences of having symptoms and receiving treatment by age group (<60 vs. ≥60 years)

Disorders	Symptoms (%)		Treatment (%)		Treatment/symptoms (%)[a]	
	<60 years	≥60 years	<60 years	≥60 years	<60 years	≥60 years
Ophthalmopathy	5.8	14.1*	2.6	10.9*	18.8	34.4*
Otopathy	5.6	14.5*	0.7	2.2*	6.5	10.6*
Rhinopathy	5.3	5.0	2.2	2.3	21.4	20.9
Respiratory diseases	5.7	8.2*	1.6	3.3*	14.8	21.6*
Digestive diseases	5.2	7.8*	1.2	3.6*	12.1	20.2*
Dental diseases	5.0	9.4*	4.0	6.6*	27.2	29.5*
Dermopathy	5.5	7.5*	2.9	3.1	28.2	26.4
Neck stiffness	10.6	13.4*	2.8	5.6*	17.7	29.7*
Lumbago	10.2	18.1*	3.9	10.1*	26.7	42.0*
Arthropathy	5.2	13.1*	1.8	6.3*	22.2	30.9*
Depression	9.2	12.0*	1.6	1.7	9.0	8.4
Total	29.2	42.6*	18.7	35.5*	41.0	57.5*

* $P < 0.05$ according to chi-square test for comparison between the two age groups: <60 years and ≥60 years

[a] Prevalence of people receiving treatment among those with symptoms

Table 4 Relative index of inequality for symptoms/disorders according to household income by age groups: results of logistic regression analysis with adjustment for age and sex

Disorders	<60 years			≥60 years		
	RII (95% CI)	Goodness of fit	Model	RII (95% CI)	Goodness of fit	Model
Ophthalmopathy	1.51 (1.27–1.80)		*	2.45 (2.12–2.82)	†	*
Otopathy	1.68 (1.40–2.01)	†	*	2.02 (1.75–2.32)	†	*
Rhinopathy	1.19 (0.99–1.43)	†	*	1.19 (0.95–1.50)	†	*
Respiratory diseases	1.34 (1.12–1.60)	†	*	1.58 (1.32–1.89)	†	*
Digestive diseases	1.67 (1.38–2.02)	†	*	1.86 (1.55–2.23)	†	*
Dental diseases	1.65 (1.36–1.99)	†	*	1.65 (1.39–1.95)		*
Dermopathy	1.12 (0.93–1.34)	†	*	1.31 (1.09–1.58)	†	*
Neck stiffness	1.20 (1.05–1.37)	†	*	1.71 (1.48–1.98)	†	*
Lumbago	1.39 (1.21–1.59)	†	*	1.77 (1.56–2.01)	†	*
Arthropathy	1.76 (1.46–2.12)		*	1.95 (1.68–2.26)	†	*
Depression	1.59 (1.38–1.84)		*	2.03 (1.74–2.36)	†	*
Total	1.19 (1.09–1.31)	†	*	1.69 (1.53–1.87)	†	*

† $P \geq 0.05$ according to Hosmer–Lemeshow test for goodness of fit; * $P < 0.05$ according to the score test for significance of model

RII Relative index of inequality, *CI* confidence interval

Table 5 RII for treatments according to household income by age groups: results of logistic regression analysis with adjustment for age and sex

Disorders	<60 years			≥60 years		
	RII (95% CI)	Goodness of fit	Model	RII (95% CI)	Goodness of fit	Model
Ophthalmopathy	1.34 (1.03–1.73)		*	1.85 (1.58–2.17)		*
Otopathy	1.18 (0.71–1.97)	†	*	2.33 (1.67–3.27)	†	*
Rhinopathy	0.77 (0.58–1.01)	†	*	1.19 (0.85–1.66)	†	
Respiratory diseases	1.43 (1.03–1.99)	†	*	1.77 (1.34–2.34)	†	*
Digestive diseases	1.36 (0.93–1.99)	†	*	1.94 (1.49–2.53)	†	*
Dental diseases	0.94 (0.76–1.16)	†	*	0.87 (0.71–1.06)		*
Dermopathy	0.71 (0.56–0.92)	†	*	0.80 (0.61–1.06)	†	*
Neck stiffness	0.92 (0.72–1.18)	†	*	1.94 (1.56–2.41)	†	*
Lumbago	1.09 (0.88–1.34)		*	1.78 (1.51–2.10)	†	*
Arthropathy	1.20 (0.88–1.64)	†	*	1.97 (1.61–2.41)	†	*
Depression	4.67 (3.29–6.61)		*	1.79 (1.23–2.62)	†	*
Total	1.04 (0.93–1.16)		*	1.51 (1.36–1.67)		*

† $P \geq 0.05$ according to Hosmer–Lemeshow test for goodness of fit; * $P < 0.05$ according to score test for significance of model

Table 6 RII for treatments in those with symptoms according to household income by age groups: results of logistic regression analysis with adjustment for age and sex

Disorders	<60 years			≥60 years		
	RII (95% CI)	Goodness of fit	Model	RII (95% CI)	Goodness of fit	Model
Ophthalmopathy	1.14 (0.75–1.73)	†		0.93 (0.70–1.23)		*
Otopathy	0.67 (0.34–1.32)	†		1.72 (1.12–2.66)	†	*
Rhinopathy	0.72 (0.45–1.13)	†		0.88 (0.51–1.52)	†	
Respiratory diseases	1.54 (0.95–2.50)	†	*	1.65 (1.08–2.50)	†	*
Digestive diseases	0.85 (0.50–1.46)	†		1.27 (0.81–2.00)	†	
Dental diseases	0.65 (0.43–0.98)	†		0.76 (0.53–1.09)	†	*
Dermopathy	0.55 (0.37–0.81)	†	*	0.81 (0.53–1.23)	†	
Neck stiffness	0.92 (0.67–1.28)	†	*	1.43 (1.06–1.93)	†	*
Lumbago	0.92 (0.69–1.23)	†	*	1.28 (1.01–1.63)		*
Arthropathy	0.77 (0.50–1.17)	†	*	1.07 (0.79–1.44)	†	
Depression	3.82 (2.32–6.29)	†	*	1.05 (0.63–1.77)	†	
Total	1.02 (0.87–1.19)	†	*	1.32 (1.13–1.54)		*

† $P \geq 0.05$ according to the Hosmer–Lemeshow test for goodness of fit; * $P < 0.05$ according to the score test for significant of model

Table 7 Prevalences of treatment and RII for cardiovascular-related diseases by age group: results of logistic regression analysis with adjustment for age and sex

Cardiovascular-related diseases	<60 years				≥60 years			
	Prevalence (%)	RII (95 CI)	Goodness of fit	Model	Prevalence (%)	RII (95 CI)	Goodness of fit	Model
Diabetes	2.6	1.62 (1.25–2.10)		*	7.4	1.38 (1.14–1.67)	†	*
Dyslipidemia	2.8	0.69 (0.54–0.89)		*	7.7	1.25 (1.04–1.50)		*
Hypertension	6.6	1.03 (0.87–1.22)		*	23.4	1.43 (1.27–1.61)		*
Stroke	0.7	2.23 (1.36–3.66)	†	*	3.2	2.20 (1.65–2.92)	†	*
Ischemic heart diseases	0.8	2.39 (1.50–3.81)	†	*	4.4	1.64 (1.29–2.08)		*
Total	10.6	1.08 (0.95–1.24)		*	35.1	1.56 (1.40–1.73)		*

† $P \geq 0.05$ according to the Hosmer–Lemeshow test for goodness of fit; * $P < 0.05$ according to the score test for significance of the model

showed a significant negative association (RII = 0.69) and hypertension, relationships between income and treatments were positive in the young group. For the senior group, all of these diseases showed significant positive associations with RII. In general, the fit of these models was not good, but all of the models were significant.

Discussion

The main finding of this study is that the prevalences of morbidities and symptoms were higher in the segment of the study population with a lower income, which is in line with the results of previous studies. As in studies conducted in other countries [25, 26], several investigations of the Japanese population have shown that those individuals with lower SES, as assessed by income, educational level, and occupational class, have higher prevalences of disorders such as diabetes and dyslipidemia [14, 27]. Compared with previous studies, we report more detailed information as well as some novel interesting findings on the relationships between income and disease prevalences in Japanese adults.

This study focused on differences in health inequalities by age groups, since previous studies in Japan have demonstrated substantial age-group differences in the associations between SES and health issues [11, 28, 29]. In our study, the senior group showed stronger relationships between lower income and higher disease prevalences. This finding raises two possibilities. First, the health effects of socioeconomic disadvantages may be cumulative, increasing with age, with unfavorable lifestyle factors and hazardous environments, including occupational conditions, affecting health cumulatively with aging. Secondly, there may be a so-called vicious cycle in the broader health inequalities in the elderly population, since poor health causes lower income, and lower income causes poor health [30].

We examined inequalities in healthcare usage based on the prevalences of treatments among those who had symptoms. The results suggest that the barriers encountered by the elderly population in terms of their access to healthcare services are minimal. Since the entire Japanese population is covered by comprehensive public healthcare insurance, anyone can obtain healthcare with only a small personal contribution. However, we found that for a few disorders, treatment prevalences in those with symptoms were lower in the young group with lower incomes. Additionally, the RIIs in the young group were generally lower than those in the senior group. We can thus speculate that individuals of working age with a lower income may hesitate to seek the appropriate healthcare services, even if they have symptoms and a worsening physical condition. In addition to differences in healthcare-seeking behavior according to SES [31], the personal contribution to the healthcare system is higher for individuals of working age than for the elderly: 30 versus 10%, respectively. These differences may influence healthcare access and generate barriers to health services for the segment of the general population with a lower income. In support of this speculation, a previous study demonstrated that people with lower incomes hesitate to seek healthcare services [32].

The association between income differences in healthcare usage determined in this study may not solely be attributable to the economic barrier. The observed differences in health behaviors may possibly result from severities of the symptoms and diseases, socioeconomic and demographic factors, personal knowledge of health issues, literacy, among others, and these factors are known to be interactively related with each other [5–8, 33, 34]. Further studies are required to examine the factors that mediate and modulate the association between income and health, with the aim to identify practical measurements that can reduce socioeconomic inequalities.

The results on CVD-related diseases, including diabetes, hypertension, and stroke, support limited access to healthcare facilities for younger members of the population with a lower income. For the young group in this study, the prevalences of stroke and ischemic disease were relatively higher than those of the senior group, but those of dyslipidemia and hypertension were not. These findings suggest that for asymptomatic disorders morbidity is higher among the lower income population, although these individuals may be reluctant to seek healthcare services, even when these disorders become increasingly severe and obvious, ultimately compelling them to receive treatment. It is possible that the lower incidence of healthcare checkups in young or lower income populations [10] lead to an underestimation of income inequalities, particularly in terms of asymptomatic diseases, such as hypertension, diabetes, and dyslipidemia, which are mainly detected by health checkups. Along with preventive measures for CVD, appropriate healthcare services, especially early detection and treatment, are required.

Depression showed a unique pattern. The relationships of lower income with symptoms and treatments were the strongest for depression. Moreover, the prevalence of treatment in those with symptoms was very high (RII = 3.82) for the young group. We assessed this relationship between income and depression in a previous study [35]; in addition to vulnerability to psychological distress in the socially disadvantaged population, we speculate that those with high SES might be reluctant to receive health care even if they are experiencing psychological discomfort.

This study has two main advantages in terms of examining the relationships between income and morbidities in

the Japanese population. First, we used a large national sample, which allowed detailed analyses of various disorders by age-group. Second, we examined not only symptoms and morbidities, but also access to healthcare services, combining data on symptoms and treatments. Since social disparities remain a major concern in the Japanese society [20, 21], the results of this study provide important evidence of inequalities in healthcare provision in Japan.

This study also has several limitations. First, the morbidities and treatments were self-reported. In general, lower SES populations are more likely to report an illness [36]. Self-reporting bias and overestimation of the relationships between income and morbidities may therefore have occurred in this study. Second, treatment includes not only medical treatments but also other forms of care, such as acupuncture and osteopathy. Third, the cut-off age for the age groups was not those commonly used in such studies, such as 65 and 70 years, and may have caused different results: the higher the age of the cut-off, the stronger the associations of income with symptoms and morbidities in the older group (supplemental analyses; data not shown). Fourth, several logistic regression models did not show the good-of-fitness and the significance. The meaning of goodness-of-fit has been debated [37], and most of the regressions with significant RII showed the significance of model. However, reconsideration of the models, such as by adding other explanatory variables, might improve the goodness-of-fit and thus result in a more accurate estimate of the RII. Fifth, this study has a cross-sectional design, such that no conclusions can be drawn regarding causal relationships. Finally, the RII of the association of income was adjusted only sex and age; other possible confounding factors were not adjusted. The residual confounding might result in an overestimation or underestimation of the influence of income on symptoms, morbidities and healthcare usage.

Socioeconomic inequalities in health care, a topic which has been receiving increasingly more attention in Japan, in terms of social disparities related to income and education are discussed here and have been reported elsewhere [20, 21]. It is important to explore these factors, accumulate more evidence on healthcare inequalities, and also to monitor relevant trends. The survey used in this study is conducted every 3 years, and the findings are useful for monitoring healthcare inequalities in the Japanese population.

In conclusion, we have demonstrated lower income to be associated with higher prevalences of physical symptoms and morbidities, with the association being stronger in the senior than in the younger members of the population. Based on the results, we suggest that although the elderly population may encounter few inequalities in terms of access to the healthcare system, individuals of working age may have a certain difficulty in receiving healthcare services due to socioeconomic disadvantages, including lower income.

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