Analysis of Relationship between Socio-Economic Factors and Subjective Health Condition among the Community Inhabitants of Japan

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Abstract

In order to examine the relationship between socio-economic factors and subjective health condition, we have analyzed the data of rural community inhabitants in Japan. We have distributed questionnaires by post for 2,928 households and received answer sheets from 1,580 households (54.0%). Contents of questionnaire are as follows; demographic data, subjective health status by SF8, lifestyle, social activity, and social capital. The results indicated that persons with better 'economic status' and higher 'frequency of participation to community events' showed statistically significant better subjective health status evaluated by SF8 questionnaires. As previous literatures have indicated, our results also suggested a significant impact of socio-economic factors to health status.

Key words: Subjective health status, Socio-economic factors, SF8, Health promotion

❖ Introduction

The relationship between socio-economic factors and health status has long been attracting concerns of researchers for the last decades. As the WHO report indicated[1], it is a solid fact that persons under the lower socio-economic condition tend to have lower health status. The inequalities in health among groups of socioeconomic status constitute the challenges for public health. Lower mortality and morbidity is associated with almost any positive indicator of socioeconomic status. Accessibility to the health services might be one of the explanations for these correlations. More educated people are better able to understand and use health information might be additional argument. However, it is also possible that people in the lower social class may tend to have unhealthy behavior, such as tobacco smoking, drug abuse, or alcoholism[2–4].

Japan has long been thought as a society of less social divide. However, the problem of social divide is becoming a big social problem in Japan because of a long lasting economic slump after the end of bubble economy. In order to overcome the managerial difficulty, most of the Japanese corporations have tried to reduce the personnel cost. They have reduced full-time employees and replaced them by part-time workers with limited work contract. It is said that this change of working culture has made our society unstable and caused social divide.

In this study, the authors examined the relationship between socio-economic factors and subjective health condition using the data of rural community inhabitants in Japan.

Table 1   Numner of respondants stratified by sex and age category

Age category		Sex		Total
		Male	Female	
20–29	N	3	3	6
	%	0.3%	0.9%	0.4%
30–39	N	63	24	87
	%	5.5%	7.0%	5.9%
40–49	N	88	18	106
	%	7.7%	5.2%	7.1%
50–59	N	207	41	248
	%	18.1%	11.9%	16.7%
60–69	N	361	65	426
	%	31.6%	18.8%	28.6%
70–79	N	282	91	373
	%	24.7%	26.4%	25.1%
80–	N	138	103	241
	%	12.1%	29.9%	16.2%
Total	N	1142	345	1487
	%	100.0%	100.0%	
100.0%				

❖ Studied Population and Method

Data were gathered from inhabitants of a rural community of Fukuoka prefecture. We have distributed questionnaires by post for 2928 households and received answer sheets from 1580 households (54.0%). Contents of questionnaire are as follows; demographic data, subjective health status by SF8, lifestyle, social activity, and social capital.

Based on the above data, we have analyzed the relationship between the subjective health status and socio-economic factors. All analyses were conducted by SPSS ver. 19 (IBM, Tokyo).

❖ Results

Table 1 shows the number of respondents according to sex and age category. Male represents 76.8% (1,142) and female 23.2% (345). Persons of 60-69 were the largest proportion (426 persons, 28.6%) followed by 70-79 (373, 25.1%), 50-59 (248, 16.7%), and 80 years old and more (241, 16.2%). More than 70% of respondents were 60 years old and more.

Table 2 shows the frequency of community events participation stratified by sex and age category.

Usually, female shows higher participation rate, but female inhabitants tend to respond lower participation rate compared with male in this population. As we sent the questionnaire to the head of household, answer might be biased. In the case of household of which female is head, they might be single and possible to work outside household. This situation might decrease the participation rate of community event. Generally speaking, the participation rate increases up to 70-79 years old and decreases after 80 years old in this population.

Table 3 shows economic status (self evaluation) stratified by sex and age category. Female persons tend to respond "slightly problematic" or "problematic" for all age category compared with male. This might be a result of bias above mentioned. It is interesting that younger generation (under 50 years old) tends to respond "problematic".

Table 4 shows results of subjective health status measured by SF8 stratified by sex and age category. In all items, male average score tend to be higher than female. Results of ANOVA, we showed statistically-significant difference except for Bodily pain (BP), Mental health (MH) and Mental Component Summery (MCS) among female responders. In most items,

Table 2   Frequency of partcipation at community events

			Frequency of partcipation at community events				Total
			Often	Some-times	Not so frequent	Rare	
Male	20–29	N	0	0	1	2	3
		%	0.0%	0.0%	33.3%	66.7%	100.0%
	30–39	N	7	16	21	13	57
		%	12.3%	28.1%	36.8%	22.8%	100.0%
	40–49	N	17	25	23	15	80
		%	21.3%	31.3%	28.8%	18.8%	100.0%
	50–59	N	51	70	41	35	197
		%	25.9%	35.5%	20.8%	17.8%	100.0%
	60–69	N	131	111	68	37	347
		%	37.8%	32.0%	19.6%	10.7%	100.0%
	70–79	N	98	97	44	30	269
		%	36.4%	36.1%	16.4%	11.2%	100.0%
	80–	N	34	29	29	34	126
		%	27.0%	23.0%	23.0%	27.0%	100.0%
	Total	N	338	348	227	166	1079
		%	31.3%	32.3%	21.0%	15.4%	100.0%
Female	20–29	N	0	0	2	0	2
		%	0.0%	0.0%	100.0%	0.0%	100.0%
	30–39	N	2	2	8	11	23
		%	8.7%	8.7%	34.8%	47.8%	100.0%
	40–49	N	4	4	3	6	17
		%	23.5%	23.5%	17.6%	35.3%	100.0%
	50–59	N	3	6	15	14	38
		%	7.9%	15.8%	39.5%	36.8%	100.0%
	60–69	N	13	18	18	12	61
		%	21.3%	29.5%	29.5%	19.7%	100.0%
	70–79	N	29	36	7	12	84
		%	34.5%	42.9%	8.3%	14.3%	100.0%
	80–	N	18	25	20	30	93
		%	19.4%	26.9%	21.5%	32.3%	100.0%
	Total	N	69	91	73	85	318
		%	21.7%	28.6%	23.0%	26.7%	100.0%

p<0.01; Chi square test

the average score decreases with increasing age however male responders who are at working age were tended to show lower score than over 60 years old people. This result might be due to stress at work as in Survey on State of Employees' Health by MHLW showed: 'The percentage of workers who have anxiety, worry and stress about their work or occupational life had become 58.0%'.

Table 5 shows the results of correlation analysis. Both 'economic status' and 'frequency of participation to community events' showed statistically significant negative correlations with all of the items of SF8 among male responders. This result indicated that persons with better 'economic status' and higher 'frequency of participation to community events' showed statistically significant better subjective health status

Table 3   Economic status stratified by sex and age category (self evaluation)

Age category			Economic status				Total
			No problem	Not so problem	Slightly problematic	Problematic	
Male	20–29	N	0	1	2	0	3
		%	0.0%	33.3%	66.7%	0.0%	100.0%
	30–39	N	8	30	14	10	62
		%	12.9%	48.4%	22.6%	16.1%	100.0%
	40–49	N	12	43	21	12	88
		%	13.6%	48.9%	23.9%	13.6%	100.0%
	50–59	N	22	104	59	19	204
		%	10.8%	51.0%	28.9%	9.3%	100.0%
	60–69	N	47	190	96	24	357
		%	13.2%	53.2%	26.9%	6.7%	100.0%
	70–79	N	35	162	61	18	276
		%	12.7%	58.7%	22.1%	6.5%	100.0%
	80–	N	24	81	19	9	133
		%	18.0%	60.9%	14.3%	6.8%	100.0%
	Total	N	148	611	272	92	1123
		%	13.2%	54.4%	24.2%	8.2%	100.0%
Female	20–29	N	0	1	2	0	3
		%	0.0%	33.3%	66.7%	0.0%	100.0%
	30–39	N	2	9	8	4	23
		%	8.7%	39.1%	34.8%	17.4%	100.0%
	40–49	N	2	6	7	3	18
		%	11.1%	33.3%	38.9%	16.7%	100.0%
	50–59	N	5	20	11	5	41
		%	12.2%	48.8%	26.8%	12.2%	100.0%
	60–69	N	5	25	25	10	65
		%	7.7%	38.5%	38.5%	15.4%	100.0%
	70–79	N	13	40	22	12	87
		%	14.9%	46.0%	25.3%	13.8%	100.0%
	80–	N	27	47	22	4	100
		%	27.0%	47.0%	22.0%	4.0%	100.0%
	Total	N	54	148	97	38	337
		%	16.0%	43.9%	28.8%	11.3%	100.0%

p<0.01; Chi square test

evaluated by SF8 questionnaires Among the female responders, economic status showed statistically negative correlation with subject health status measured by SF8 except for Physical functioning (PF), Role physical (RP) and Physical Component Summary (PCS). On the other hand, frequency of participation to community events showed statistically negative correlation with subject health status measured by SF8 except for Role physical (RP) and Bodily pain (BP).

❖Discussion

As previous literatures have indicated[1–4], our results also suggested a significant impact of socio-economic factors to health status. Several limitations must be considered when interpreting our results. First, this study is a cross-sectional study, so it is difficult to discuss direction of causality of socio-economic factors and subjective health condition. Until now, there are few studies analyzed the relationship between socio-economic status and subjective health

Table 4   Health status measured by SF8 stratified by sex and age category

	age category		General health (GH)	Physical functioning (PF)	Role physical (RP)	Bodily pain (BP)	Vitality (VT)	Social functioning (SF)	Mental health (MH)	Role emotional (RE)	Physical Component Summary (PCS)	Mental Component Summery (MCS)
Male	20–29	N	3	3	3	3	3	3	3	3	3	3
		Mean	50.7	53.6	53.9	57.4	54.5	51.6	55.1	52.6	52.8	51.9
		SD	0.0	0.0	0.0	4.9	0.0	5.5	4.1	3.0	3.0	5.6
	30–39	N	62	62	61	62	61	60	62	62	58	58
		Mean	48.6	51.6	51.9	51.1	50.6	51.1	49.3	49.2	50.7	48.7
		SD	7.7	6.1	4.2	9.6	6.9	7.7	7.8	6.7	6.0	7.1
	40–49	N	87	86	85	87	87	83	84	87	77	77
		Mean	48.6	51.8	52.3	50.4	50.0	51.5	49.5	50.1	50.6	48.8
		SD	6.4	5.6	3.7	8.7	5.8	5.5	6.3	5.7	5.4	6.2
	50–59	N	204	203	202	205	204	193	204	205	187	187
		Mean	49.3	50.5	50.7	50.2	50.7	50.5	50.0	49.4	49.5	49.1
		SD	5.9	6.8	5.6	7.6	6.0	6.9	6.3	6.3	6.1	6.3
	60–69	N	356	356	355	357	354	345	356	358	333	333
		Mean	49.7	49.8	50.3	50.6	51.8	51.1	52.3	50.8	48.5	51.6
		SD	6.4	7.0	6.9	8.0	6.1	7.3	5.8	5.7	6.5	5.3
	70–79	N	265	264	261	266	260	247	265	265	236	236
		Mean	48.1	47.7	47.3	48.8	49.8	49.8	51.1	49.2	46.1	50.9
		SD	7.4	8.6	9.2	8.9	7.8	7.7	6.4	8.6	7.9	6.2
	80–	N	130	126	124	127	130	122	128	127	114	114
		Mean	46.0	43.2	42.8	47.9	47.8	45.8	50.5	46.6	42.1	49.6
		SD	7.5	11.6	11.5	8.6	7.6	10.9	7.2	11.2	9.5	8.1
	Total	N	1107	1100	1091	1107	1099	1053	1102	1107	1008	1008
		Mean	48.7	48.9	49.1	49.8	50.5	50.1	51.0	49.5	47.7	50.4
		SD	6.9	8.2	8.1	8.4	6.8	7.9	6.5	7.5	7.5	6.3
p-value (ANOVA)			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Female	20–29	N	3	3	3	3	3	3	3	3	3	3
		Mean	44.3	48.0	46.5	43.4	46.5	46.1	50.9	49.3	42.8	50.0
		SD	5.5	5.9	3.4	4.8	4.3	8.2	6.3	4.9	5.0	6.0
	30–39	N	49	23	23	24	24	23	24	23	22	22
		Mean	48.6	51.7	50.8	48.3	50.5	44.7	47.6	48.9	50.2	46.4
		SD	7.4	3.7	5.4	9.6	5.0	11.8	9.1	6.6	5.2	8.9
	40–49	N	18	18	18	18	18	16	18	18	16	16
		Mean	48.4	51.8	50.2	50.9	48.5	49.3	50.1	49.6	49.2	47.7
		SD	7.1	4.8	9.2	8.1	8.5	8.6	8.9	7.2	7.0	9.3
	50–59	N	41	41	41	41	41	39	41	41	39	39
		Mean	49.3	50.6	51.1	47.4	49.3	51.0	49.3	49.8	48.5	49.4
		SD	6.3	4.0	4.4	8.1	5.8	5.5	8.2	5.6	5.3	7.0
	60–69	N	64	64	62	64	63	58	64	63	57	57
		Mean	48.2	48.7	49.3	48.2	51.0	48.9	49.6	49.1	47.2	49.2
		SD	7.6	7.2	7.0	10.0	7.1	8.4	7.7	7.8	7.3	7.4
	70–79	N	88	85	87	88	86	82	88	87	75	75
		Mean	47.9	46.3	47.6	47.8	50.4	47.6	50.0	48.6	45.3	49.9
		SD	6.5	7.4	9.1	8.4	7.2	9.0	6.9	8.1	8.0	7.2
	80–	N	95	95	81	94	95	90	94	93	84	84
		Mean	45.4	39.8	39.9	46.8	46.1	44.0	47.7	43.1	40.3	47.2
		SD	7.7	13.2	13.1	8.7	8.2	11.8	8.4	13.0	10.3	8.8
	Total	N	333	329	329	332	330	311	332	328	296	296
		Mean	47.5	46.1	46.5	47.7	49.0	47.1	49.0	47.4	45.2	48.5
		SD	7.2	9.9	10.3	8.8	7.5	9.9	7.9	9.7	8.7	8.0
p-value (ANOVA)			0.040	<0.001	<0.001	0.633	0.001	0.003	0.480	<0.001	<0.001	0.294
			1.207	2.828	2.520	2.072	1.479	2.980	1.999	2.176	2.523	1.856

Table 5   Correlation coeficients (CC) among the socio-economic factors and items of SF8 questionnaire

		Economic status	Community event partipation	General health (GH)	Physical function-ing (PF)	Role physical (RP)	Bodily pain (BP)	Vitality (VT)	Social function-ing SF)	Mental health (MH)	Role emotional (RE)	Physical Component Summary (PCS)	Mental Component Summery (MCS)
Male	Economic status CC	1	0.091	–0.207	–0.161	–0.200	–0.176	–0.243	–0.151	–0.227	–0.223	–0.171	–0.210
	p-value	.	*0.003*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n	1133	1073	1100	1094	1089	1102	1093	1048	1097	1102	1006	1006
	Community event partipation CC		1	–0.184	–0.172	–0.141	–0.121	–0.223	–0.196	–0.164	–0.193	–0.121	–0.207
	p-value		.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n		1088	1057	1054	1045	1058	1049	1007	1055	1058	967	967
	General health (GH) CC			1	0.464	0.496	0.457	0.669	0.428	0.420	0.464	0.612	0.387
	p-value			.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n			1117	1103	1095	1110	1101	1057	1106	1110	1018	1018
	Physical func-tioning (PF) CC				1	0.793	0.526	0.477	0.530	0.312	0.469	0.791	0.179
	p-value				.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n				1110	1092	1105	1096	1054	1102	1107	1018	1018
	Role physical (RP) CC					1	0.527	0.531	0.567	0.368	0.532	0.775	0.273
	p-value					.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n					1101	1098	1086	1047	1095	1100	1018	1018
	Bodily pain (BP) CC						1	0.453	0.388	0.384	0.428	0.754	0.173
	p-value						.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n						1117	1104	1059	1109	1115	1018	1018
	Vitality (VT) CC							1	0.442	0.400	0.463	0.598	0.443
	p-value							.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n							1109	1049	1098	1103	1018	1018
	Social function-ing SF) CC								1	0.495	0.613	0.420	0.624
	p-value								.	*0.000*	*0.000*	*0.000*	*0.000*
	n								1063	1059	1061	1018	1018
	Mental health (MH) CC									1	0.649	0.146	0.865
	p-value									.	*0.000*	*0.000*	*0.000*
	n									1112	1110	1018	1018
	Role emotional (RE) CC										1	0.319	0.760
	p-value										.	*0.000*	*0.000*
	n										1117	1018	1018
	Physical Compo-nent Summary (PCS) CC											1	–0.010
	p-value											.	0.748
	n											1018	1018
	Mental Compo-nent Summery (MCS) CC												1
	p-value												.
	n												1018
Female	Economic status CC	1	0.148	–0.205	–0.009	–0.023	–0.179	–0.204	–0.148	–0.278	–0.208	–0.018	–0.276
	p-value	.	*0.008*	*0.000*	0.871	0.679	*0.001*	*0.000*	*0.009*	*0.000*	*0.000*	0.759	*0.000*
	n	345	323	334	330	328	333	331	312	333	329	298	298
	Community event partipation CC		1	–0.276	–0.122	–0.111	–0.091	–0.319	–0.223	–0.234	–0.204	–0.139	–0.240
	p-value		.	*0.000*	*0.031*	0.051	0.107	*0.000*	*0.000*	*0.000*	*0.000*	*0.019*	*0.000*
	n		327	316	313	311	316	314	297	316	312	284	284
	General health (GH) CC			1	0.566	0.583	0.464	0.704	0.500	0.468	0.538	0.642	0.456
	p-value			.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n			342	337	334	339	337	319	340	336	305	305
	Physical func-tioning (PF) CC				1	0.809	0.502	0.547	0.581	0.401	0.628	0.866	0.317
	p-value				.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n				338	332	336	334	316	335	332	305	305
	Role physical (RP) CC					1	0.492	0.569	0.651	0.484	0.698	0.816	0.445
	p-value					.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n					335	334	331	315	333	332	305	305
	Bodily pain (BP) CC						1	0.491	0.413	0.428	0.505	0.708	0.269
	p-value						.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n						341	337	319	339	335	305	305
	Vitality (VT) CC							1	0.517	0.477	0.592	0.613	0.539
	p-value							.	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	n							339	317	336	332	305	305
	Social function-ing SF) CC								1	0.595	0.694	0.496	0.724
	p-value								.	*0.000*	*0.000*	*0.000*	*0.000*
	n								320	319	315	305	305
	Mental health (MH) CC									1	0.684	0.251	0.883
	p-value									.	*0.000*	*0.000*	*0.000*
	n									341	336	305	305
	Role emotional (RE) CC										1	0.507	0.790
	p-value										.	*0.000*	*0.000*
	n										337	305	305
	Physical Compo-nent Summary (PCS) CC											1	0.147
	p-value											.	0.010
	n											305	305
	Mental Compo-nent Summery (MCS) CC												1
	p-value												.
	n												305

condition in a longitudinal design[5]. In a recent study, Klein *et al*. showed that social relations are an important explanatory factor for health inequalities in a longitudinal design[5]. However, the effectiveness of intervention is unclear, therefore we have to organize social programs targeting not only to health promotion but also to community development.

So far as the causal pathway, there have been several theories. Fuchs indicated the difference of time preference would cause different attitude for healthy life style[6]. He has suggested that a person with higher time preference tends to invest for future and as a result not to take unhealthy life style, such as smoking and heavy drinking. A better time preference is associated with more invest in education for oneself and one's children which might explain a positive relationship among educational, economic and health status.

According to our previous study using the Family Income and Expenditure Survey in Japan[7], the elasticity of education has been consistently greater than unity. This result suggested that education is very important demand for Japanese household. By contrast, an increase in income leads to a fall in the tobacco smoking suggesting that people living in the household of lower socioeconomic status were likely to consume more tobacco. This result might support the Fuchs' theory on the relationship between education and health status.

Considering the economic difficulty to which most of the local municipalities face, it is rather difficult to largely expand social budget for supporting persons with socio-economic difficulty. One of the possible solutions is to develop a workfare type of social program. The low economic situation during 20 to 60 years old has a severe effect on the socio-economic status of old age period because of lower pen-

sion (no pension is also possible) and possibly worse health status. As the experiences of other countries such as Nordic countries, the workfare type of social programs show a promised effect on workability. It is strongly recommended for the Japanese government to promote this type of program in order to decrease the social divide.

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