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Original Research

Subjective life satisfaction and its determinants in residents in remote islands

—— From a perspective of settlement-level Social Capital ——

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Abstract

The aim of this study was to examine determinants of subjective life satisfaction in remote islands from a perspective of settlement level Social Capital (SC). In this study, random sampled 710 residents at one city in a remote island were surveyed by self-administered questionnaire. We divided the residents into three categories of social capital (bridging SC group, bonding SC group and intermediate SC group) and examined each group by multiple regression analysis. In the bridging SC group, high social supports from family members statistically influenced subjective life satisfaction of residents. In the intermediate SC group, high social supports from settlement members statistically influenced their subjective life satisfaction. In the bonding SC group, no social supports influenced them. It is suggested that settlement level SC is an important factor of effective health program for residents in remote islands.

Key words : settlement level social capital, subjective life satisfaction, residents in remote islands, healthcare activity

Introduction

In supporting individuals, it is crucial to have interplay of self-help and group help, support from public programs and services. Furthermore, it is essential to have flexible and multilayered support through diverse entities focusing primarily on the development and enhancement of mutual assistance (Ministry of Health, Labour, and Welfare Social Security Council Subcommittee on Long-Term Care Insurance 2013). In remote islands, resources for formal means of support, primarily those from public services, are absolutely limited (Shimizu et al. 2004), and many residents have built up various networks based on traditional neighborly and filial bonds (Moriho et al. 2012). Research (Tsutsui 2009) has shown that comprehensive regional care systems are positioned not as public services, but as systems that combine mutual and self-assistance through joint regional organizations. In such remote islands, where neighbors frequently use their proximity to interact with and help one another, it is believed that social bonds are a form of assistance that plays a major role for residents' health (Toriya 2002) (Kaneshiro 2013).

In recent years, these social bonds have been conceptualized as social capital (SC), and there have been increasing movements to verify the effective relationships they have on improving such matters as health and healthcare policies (Kondo et al. 2010) (Sakurai et al. 2010) (Taguchi,

Natsubara 2015). The significant effects of fostering SC through regional activities, supporting mutual and self-help among residents, and finding policies for autonomously and continuously supporting the improvement of people's health has also been indicated in guidelines for public health nurses (Ministry of Health, Labour, and Welfare 2013), and the introduction of the concept of SC has been encouraged in health improvement plans (Ministry of Health, Labour, and Welfare Issues Council 2012). Similar adoptions have also been recognized for many policies related to improving people's health, and foundations have been laid to support the development of healthcare activities approached from multiple angles, including the social factor of "regionality."

At the same time, given the regional organization of more remote islands, it is essential to have a perspective that uses settlements as one's point of reference. On islands with a high degree of isolation between settlements, a strong culture that perceives each settlement as a discrete unit with regard to the conventional scope of mutual and self-help has often taken hold (Toriya 2002). We can see in settlements the individuality of regions, which has been handed down in the form of rich identities and social groups. It is evident from histories that settlements have become the bedrock of people's daily lives from long years of community council management activities, ceremonies including coming of age, marriage, burial, and ancestral celebrations, and preserved traditions (Moriho et al. 2012). There are various arguments as to how one should outline regional units when identifying frameworks for support. For example, in building comprehensive regional care systems, middle school districts have been a specific unit of area, given that necessary care services can be provided inside these districts within approximately 30 minutes (Ministry of Health, Labour, and Welfare 2013).[12] Additionally, in mountainous rural areas where depopulation and aging demographics are pronounced, there are active movements to conceive of settlements as "small hubs" of integrated daily activities (Ministry of Land, Infrastructure and Transport 2013). Within this context, guiding the concept of small-scale health communities using island settlements as the point of reference is considered extremely important for encouraging self-directed improvement of health in close association with daily life.

From the above, this paper addresses subjective life satisfaction as an indicator of quality of life in island communities. In order to create foundational material that would be helpful in future healthcare activities, the paper discusses the relationship between determinants of life satisfaction and SC on the level of regional settlements.

Methods

1. Subjects

1) Subjects

We used data of a survey aimed at formulating health improvement plans that was implemented on 1,400 residents between the ages of 20–75 living in 21 villages of town C, county B, prefecture A. The residents included 1,200 subjects covered by the National Health Insurance scheme and 200 covered by the Social Health Insurance scheme. Selections of subjects were made randomly and in proportion to the population of the settlement.

2) Overview of the target region

The target region was island D, which has two municipalities, including town C. Island D is 500 km removed from "mainland" Japan, has a population over 10,000, and is characterized by its small size, presence of ocean in all directions, and high degree of isolation (defined by its specific distance from the nearest neighbor island). Town C has a population of 6,806 people, 29.8% of whom are aged 65 or older (2010 Census data), and has a pronounced depopulation and aging trend. There are, however, variations in this regard between different settlements on the island. In total, there are 21 large and small settlements, each with their own rallying slogans that evidence strong affiliation to each unit. In the vernacular, local residents call a settlement an "aza."

Formal medical facilities available in town C are one hospital and two clinics. There is also a Health Center and a Comprehensive Regional Support Center, both run by the municipality. These centers offer healthcare suited to different stages of life.

2. Methodology

1) Survey method

The survey was carried through a self-administered questionnaire aimed at gathering basic material for formulating health improvement plans. Before the survey, briefings on the scope of the research were offered at local administrative assemblies, after which members of each settlements were asked to distribute the

questionnaires. Respondents mailed in the documents when finished. The survey period was from December 6–24, 2010.

2) Survey content

(1) Individual affiliations, relevant social particularities, lifestyle habits, healthcare activities, life satisfaction

Subjects were given questions related to demographics, including gender, age, and family members living in one's home, as well as questions related to sociology, including economic circumstances, employment status, and social support (SS). Life satisfaction was evaluated on a four-point scale and treated as a health-related indicator of quality of life.

Subjects were asked to indicate whether or not they smoked, consumed alcohol, engaged in recreation, ate adequate meals, exercised, and participated in social activities. All questions were ultimately tallied to arrive at total scores. With regard to healthcare activities, subjects were asked whether they had a primary care physician, whether they had received a full, comprehensive health exam in the past year, and whether they had ever participated in any healthcare programs.

In terms of SS, two types were analyzed : families/relatives versus settlements (the latter were referred to as "aza," using the vernacular terminology) by asking subjects to specify whether they had emotional support (one question addressing receiving support, one question addressing giving support) and whether they had practical support (likewise, two questions on receiving and giving support). Totals were tallied separately for social support from family/relatives (family/relatives SS) and social support from members of the settlement (settlement SS).

(2) Social capital

Elements constituting SC were : social activities (within the settlement), social activities (outside the settlement), trust in one's region (5-point scale), reciprocity with one's region (5-point scale), affinity for one's region (5-point scale), level of interaction with one's neighbors (4-point scale), and social cohesiveness (whether or not one participates in local festivals). With regard to social activities, the question was divided into regionally internal and external activities after interviewing community councils on their affairs. For social activities, subjects were asked whether they participated in seven of the settlement's internal/external activities, and if they responded yes to one or more, they were judged to be "socially active."

3) Analytical methods

The eight data points noted above were taken as constituents of SC. Using cluster analysis, similar settlements were classified into three groups. A "bridging SC" group and a "bonding SC" group were labeled as basic types of SC. The bonding SC group displayed internal reliance, cooperation, and cohesiveness among individuals in a group with similar ties. The bridging SC group displayed a network of connections between groups or individuals with dissimilar ties. Addressing properties of SC with settlements as the unit of analysis, this research also addressed SC point totals for the three categories of (1) a bridging SC group demonstrating relatively stronger ties outside the settlement, (2) a bonding SC group demonstrating stronger ties within the settlement, and (3) an intermediate SC group that did not have a strong characteristic in either direction. For each of the three categories, multiple regression analysis was carried out to examine the impact of individual affiliation, social particularities, lifestyle habits, healthcare activities, and life satisfaction. Note that no differences were observed for the three categories in terms of population scale and distances between settlements.

3. Ethical considerations

Briefings given to subjects relied on voluntary cooperation with the content of the research, preservation of privacy, and participation in the project. In order to ensure no ethical harm to subjects, local coordinators from the settlements (employees and social workers of town C's health promotion department, including public health nurses) were asked to give the explanations working from a written script. The Ethics Review Board of Kagoshima University's Faculty of Medicine also granted approval for this research.

Results

710 residents responded to the survey (50.7% response rate). A fair degree of regularity was seen in response rates between settlements.

1. Characteristics of research subjects

(1) Individual characteristics

A. Affiliation and life satisfaction

Males : 350 (49.3%), Females : 360 (50.7%).

Average age was 57.3±13.7 years.

With regard to life satisfaction, 84 (11.8%) replied "extremely satisfied" and 454 (63.9%) replied "somewhat satisfied," while 106 (14.9%) replied "somewhat dissatisfied" and 27 (3.8%) replied "extremely dissatisfied."

B. Social support

With regard to emotional support from family/relatives, 603 (84.9%) said that they were able to receive such support and 560 (78.9%) said they provide such support. With regard to practical support, 606 (85.4%) said they were able to receive such support and 642 (90.4%) said they provide such support.

On the level of the settlement, 359 (50.6%) said they were able to receive emotional support and 360 (50.7%) said they provide such support. For practical support to/from the settlement, 145 (20.4%) said they were able to receive such support and 355 (50.0%) said they provide such support.

(2) Regional-level items (related to SC)

With regard to social activities within the settlement, the largest number of respondents, 432 (60.8%) said they participate in "settlement activities," while the second, 280 (39.4%) said they participate in the "community council, women's association, youth association, or senior citizens' association."

As for social activities outside the settlement, the largest number of respondents, 293 (41.3%) said they participate in "municipal activities (elementary school activities, sports days put on by the larger municipality, etc.)," while the second, 192 (27.0%) said they participate in "volunteer activities."

As for trust placed in the region, more than half, 419 (59.0%), of respondents said their trust was "very high" or "somewhat high." As for reciprocity in the region, 453 (63.8%) replied that there is "strong reciprocity" or "decent reciprocity." With regard to affinity for the region, 497 (70.0%) said that they have "strong affinity" or "fair affinity."

As for interaction with neighbors, the largest number of respondents, 291 (41.0%), reported that their "interaction is on the level of engaging in daily chats." In this category, a large number, 285 (40.1%), said they "are fairly well acquainted with or interact with about 5–19 people." In terms of cohesiveness, a fair number, 463 (65.2%), responded that they actively take part in local events, festivals, and the like.

2. Determinants of subjective life satisfaction

1) Relationships between two variables

The study verified the relationships between the score of subjective life satisfaction and the other variables of individual affiliation (gender, age (elderly/very elderly), presence/absence of family members in the same home), social particularities (economic circumstances, employment status, family/relative SS, settlement SS), lifestyle habits (number of healthy habits), and healthcare activities (presence/absence of a primary care physician, health exam or full health exam in the past year, experience being part of healthcare programs).

Significant relationships observed in the subjects overall were age (MW test $p<0.001$; younger subjects had higher scores), economic circumstances (Spearman's correlation coefficient $p<0.001$; those with financial leverage had higher scores), employment status (MW test $p<0.001$; those with jobs had higher scores), presence/absence of a primary care physician (MW test $p=0.013$; those without a PC physician had higher scores), family/relative SS (Spearman's correlation coefficient $p=0.000$; scores rose as level of support rose), and settlement SS (Spearman correlation coefficient $p=0.008$; scores rose as level of support rose).

2) Determinants of subjective life satisfaction found in subjects overall : multiple regression analysis

Gender and age variables were entered by forced entry method, while the stepwise method was used to select variables in other categories.

Results showed that economic circumstances, receiving family/relative SS, and receiving settlement SS had significant effects on subjective life satisfaction (Table 2). Life satisfaction was high for those with financial leverage, rich SS from family/relatives, and rich SS from the settlement. Gender, age, number of healthy lifestyle habits, presence/absence of a PC physician, history of health exams, and experience taking part in healthcare programs did not remain in the model.

3) Determinants of subjective life satisfaction seen in each type of SC : multiple regression analysis

Similar analysis was carried on the three categories of SC : settlements with bridging SC, bonding SC, and intermediate SC. In settlements with bridging SC, results showed that economic circumstances, presence of a PC physician, and receiving family/relative SS had significant

Table 1 Subject characteristics (Overall/by type of SC)

		Overall		Type of SC					
				Bridging		Bonding		Intermediate	
		(n=710)		(n=340)		(n=159)		(n=180)	
		n%	(M±SD)	n%	(M±SD)	n%	(M±SD)	n%	(M±SD)
Individual characteristics									
Gender	Male	350	49.3	171	50.3	75	47.2	90	50.0
	Female	360	50.7	169	49.7	84	52.8	90	50.0
Age		710	57.3±13.7	340	56.9±13.4	159	58.4±13.6	180	56.1±14.6
Live with family	Yes	614	86.5	296	87.1	139	87.4	149	82.8
	No	80	11.3	36	10.6	14	8.8	29	16.1
	Did not answer	16	2.3	8	2.4	6	3.8	2	1.1
Employed	Yes	537	75.6	268	78.8	120	75.5	127	70.6
	No	165	23.2	69	20.3	36	22.6	51	28.3
	Did not answer	8	1.1	3	0.9	3	1.9	2	1.1
Economic circumstances									
	Stable, with room to spare	68	9.6	22	6.5	22	13.8	19	10.6
	Stable, but not much room to spare	387	54.5	176	51.8	96	60.4	100	55.6
	Struggling and somewhat worried	159	22.4	89	26.2	29	18.2	35	19.4
	Struggling and very worried	64	9.0	36	10.6	4	2.5	20	11.1
	Did not answer	32	4.5	17	5.0	8	5.0	6	3.3
Condition of health									
Subjective assessment									
	Very healthy	113	15.9	51	15.0	26	16.4	31	17.2
	Somewhat healthy	463	65.2	226	66.5	99	62.3	118	65.6
	Not so healthy	98	13.8	46	13.5	26	16.4	21	11.7
	Unhealthy	21	3.0	9	2.6	4	2.5	8	4.4
	Did not answer	15	2.1	8	2.4	4	2.5	2	1.1
Health-related lifestyle habits									
Smoking									
	Smoke	140	19.7	69	20.3	28	17.6	39	21.7
	Do not smoke	540	76.1	257	75.6	123	77.4	137	76.1
	Did not answer	30	4.2	14	4.1	8	5.0	4	2.2
Alcohol									
	Drinks	396	55.8	184	54.1	92	57.9	103	57.2
	Do not drink	274	38.6	136	40.0	61	38.4	68	37.8
	Did not answer	40	5.6	20	5.9	6	3.8	9	5.0
Adequate rest and sleep									
	Yes	473	66.6	225	66.2	105	66	121	67.2
	No	223	31.4	108	31.8	50	31.4	57	31.7
	Did not answer	14	2.0	7	2.1	4	2.5	2	1.1
Food portions (careful not to overeat)									
	Yes	426	60.0	204	60.0	99	62.3	104	57.8
	No	270	38.0	131	38.5	56	35.2	72	40
	Did not answer	14	2.0	5	1.5	4	2.5	4	2.2
Exercise habits (and inclination)									
	Exercise regularly (for 6 mos. or more)	108	15.2	40	11.8	27	17.0	36	20.0
	Exercise regularly (for less than 6 mos.)	19	2.7	11	3.2	0	0.0	7	3.9
	Exercise occasionally	166	23.4	74	21.8	32	20.1	46	25.6
	Would like to start soon	14	2.0	9	2.6	1	0.6	3	1.7
	Would like to but cannot	311	43.8	152	44.7	76	47.8	75	41.7
	Not interested	68	9.6	40	11.8	17	10.7	10	5.6
	Did not answer	24	3.4	14	4.1	6	3.8	3	1.7
Participation in social activities									
	Participate in some form	525	73.9	240	70.6	131	82.4	128	71.1
	Do not participate	117	16.5	63	18.5	12	7.5	39	21.7
	Did not answer	68	9.6	37	10.9	16	10.1	13	7.2

Table 1 Subject characteristics (Overall/by type of SC) con't

	Overall		Type of SC					
			Bridging		Bonding		Intermediate	
	(n=710)		(n=340)		(n=159)		(n=180)	
	n%	(M±SD)	n%	(M±SD)	n%	(M±SD)	n%	(M±SD)
Healthcare activities								
Primary care physician								
Present	408	57.5	196	57.6	93	58.5	99	55.0
Not present	259	36.5	122	35.9	54	34.0	72	40.0
Did not answer	43	6.1	22	6.5	12	7.5	9	5.0
Exam/full health exam in past year								
Received	463	65.2	213	62.6	107	67.3	117	65.0
Not received	206	29.0	110	32.4	39	24.5	53	29.4
Did not answer	41	5.8	17	5.0	13	8.2	10	5.6
Experience receiving health services								
Yes	241	33.9	111	32.6	54	34.0	63	35.0
No	469	66.1	229	67.4	105	66.0	117	65.0
Social support (SS)								
Family/relatives								
Receive emotional support	603	84.9	283	83.2	141	88.7	154	85.6
Do not receive	73	10.3	40	11.8	8	5.0	22	12.2
Did not answer	34	4.8	17	5.0	10	6.3	4	2.2
Provide emotional support	560	78.9	261	76.8	119	74.8	155	86.1
Do not provide	97	13.7	52	15.3	22	13.8	20	11.1
Did not answer	53	7.5	27	7.9	18	11.3	5	2.8
Receive practical support	606	85.4	289	85.0	139	87.4	151	83.9
Do not receive	72	10.1	36	10.6	10	6.3	24	13.3
Did not answer	32	4.5	15	4.4	10	6.3	5	2.8
Provide practical support	642	90.4	308	90.6	143	89.9	162	90.0
Do not provide	32	4.5	17	5.0	4	2.5	11	6.1
Did not answer	36	5.1	15	4.4	12	7.5	7	3.9
Settlement ("aza")								
Receive emotional support	359	50.6	178	52.4	84	52.8	82	45.6
Do not receive	249	35.1	116	34.1	41	25.8	80	44.4
Did not answer	102	14.4	46	13.5	34	21.4	18	10.0
Provide emotional support	360	50.7	182	53.5	73	45.9	87	48.3
Do not provide	241	33.9	108	31.8	51	32.1	73	40.6
Did not answer	109	15.4	50	14.7	35	22.0	20	11.1
Receive practical support	145	20.4	69	20.3	40	25.2	30	16.7
Do not receive	432	60.8	212	62.4	79	49.7	123	68.3
Did not answer	133	18.7	59	17.4	40	25.2	27	15.0
Provide practical support	355	50.0	172	50.6	78	49.1	87	48.3
Do not provide	239	33.7	117	34.4	41	25.8	74	41.1
Did not answer	116	16.3	51	15.0	40	25.2	19	10.6

Table 2 Determinants of life satisfaction : Overall

	β (standardized coefficient)	p
Gender	0.031	0.467
Age (elderly)	0.028	0.512
Economic circumstances	0.394	0.000
No. of healthy lifestyle habits	—	—
Primary care physician	—	—
Receive health-related exams	—	—
Experience receiving health services	—	—
Family/relatives SS	0.133	0.003
Settlement SS	0.187	0.000

Table 3 Determinants of life satisfaction: "Bridging" settlements

	β (standardized coefficient)	p
Gender	−0.018	0.759
Age (elderly)	0.085	0.161
Economic circumstances	0.317	0.000
No. of healthy lifestyle habits	—	—
Primary care physician	0.191	0.002
Receive health-related exams	—	—
Experience receiving health services	—	—
Family/relatives SS	0.248	0.000
Settlement SS	—	—

Table 4 Determinants of life satisfaction: "Bonding" settlements

	β (standardized coefficient)	p
Gender	0.121	0.204
Age (elderly)	−0.071	0.485
Economic circumstances	0.471	0.000
No. of healthy lifestyle habits	—	—
Primary care physician	—	—
Receive health-related exams	—	—
Experience receiving health services	—	—
Family/relatives SS	—	—
Settlement SS	—	—

Table 5 Determinants of life satisfaction: "Intermediate" settlements

	β (standardized coefficient)	p
Gender	0.038	0.631
Age (elderly)	−0.013	0.873
Economic circumstances	0.490	0.000
No. of healthy lifestyle habits	—	—
Primary care physician	—	—
Receive health-related exams	—	—
Experience receiving health services	—	—
Family/relatives SS	—	—
Settlement SS	0.220	0.007

effects on subjective life satisfaction (Table 3). In settlements with bonding SC, a relationship was only seen with regard to economic circumstances (Table 4). And in settlements with intermediate SC, relationships were seen with economic circumstances and receiving settlement SS (Table 5).

Discussion

1. Determinants of subjective life satisfaction

In the region overall, life satisfaction related with the state of SS with one's family and relatives. Analyzing the determinants of life satisfaction for each type of SC, results showed that the richness of settlement SS meaningfully related with high life satisfaction for settlements with intermediate SC. Meanwhile, with regard to settlements with bridging SC, richness of settlement SS was not a factor and richness of family/relative SS significantly related with high life satisfaction. It suggests that, in settlements with bridging SC, SS from the settlement did not function well because of the formation of a network outside the settlement, so that the role of SS from family/relatives became more important. As for settlements with intermediate SC, they displayed relatively close connections inside the settlement compared to the bridging groups, which suggests that SS from the settlement functions well. Meanwhile, settlements with bonding SC did not show a relationship with SS from either family/relatives or from the settlement. The reason for this was likely that settlements with bonding SC were the groups with the closest connections inside the settlement,

which boosted residents' life satisfaction and probably made it harder to observe effects from SS. As a whole, our research's settlement-level perspective of remote islands showed that the type of SC affects the state of subjective life satisfaction.

2. Development of health-related activities given each type of SC

Much research has shown that the accumulation of SC in a region is conducive to cooperative behavior. Similarly, from a SC perspective, this encourages the cooperation on "health promotion" (HP) activities and the implementation of more effective intervention (Yuasa et al. 2006). In the case of our research, it was seen that smaller-sized regional units with different SC characteristics may have different determinants on positive health in each location. Especially with regard to life satisfaction, the research suggested that it is effective to use approaches focusing on relations with family and relatives in settlements with bridging SC, and focusing on close connections on a community level in settlements with bonding and intermediate SC. This suggests that more effective health-related activities could be created and enhanced by considering and leveraging these different types of SC.

The strong network ties within organizations with a high level of bonding SC have sometimes been related with the disadvantageous tendency to be too inwardly focused or exclusive towards external parties. On the other hand, Inoue and Watabe (2015) have argued that, in their report of social activities in farming communities, it is possible to bring health benefits to individuals when regional SC is capital high, yet individuals' actual participation in activities is absent (i. e. individual SC is low). Our research also showed that SC, the diversity of relationships inside and outside a settlement, can influence the health of individuals in a settlement, and that reframing the characteristics of regions with high bonding or intermediate SC, in particular, is effective for creating those diverse relationships.

At the same time, public health nurses in these regions have actively participated in public and private social activities and have rolled out health-related activities specifically suited to many different settlements. These are examples of real-world activities leveraging SC on this micro level. Going forward, it would be favorable to strive for more integrated health-related activities that preserve and foster the cultural identities of settlements and of the islands as a whole. This should be undertaken while examining the physicality of public health nurses which is developed by getting involved in the public and private lifestyles of regions, while also examining relations with SC that these nurses come to understand in the course of their work (Hanibuchi et al. 2008).

3. Limits of research and future challenges

The present study calculated settlement level SC scores using individual responses to questions about SC, then created three SC categories by relative characteristics within the subject community. With regard to the suitability of these categories, there are limits to using them in broad, because they are relative differentiations within a single municipality. However, It is arguable that the categories have a degree of suitability for their target region, since the research was carried out after gaining the consent of, and having discussions with, administrators of the municipality, district leaders, and others. It will be necessary, however, to broaden this approach to other municipalities and confirm the findings of this study.

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