Setouchi Sustainability & Wellbeing Research Project Report
Cultural Activities and Health; Fostering Social Capital

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Background

Since the Echigo-Tsumari Art Triennale held in 2000, art festivals have become increasingly popular in various parts of Japan. Many of these festivals are dependent on the particular characteristics and context of the region, with the main purpose of revitalizing the local community.[1)] The Setouchi Triennale is an arts festival that has been organized by the Benesse Group on Naoshima since 2010.[2)] It has developed into an art project with the largest number of visitors in Japan.[3)] The approach to revitalizing the local community through these activities was initiated in 1992, and has come to be known as the Naoshima Method. [4)] The Naoshima Method is an approach for arts-mediated community-building through the activities of Benesse Art Site at Naoshima by Benesse Holdings and Fukutake Foundation, which aim to promote "well-being" through art experiences and interaction with the landscape, community, and people. Naoshima Town is located in western Japan, in Kagawa Prefecture.

In the field of social epidemiology, it is said that social/environmental factors such as social networks and attributes of communities affect individuals' health.[5), 6)] Social capital (SC) is attracting attention as one of such social determinants.[7), 8)] Many previous studies have examined the relationship between SC and various health indicators including mortality, heart disease, mental health indicators, and smoking.[9)]

Art projects can be used as tools to help foster SC, and research focusing on grassroots bottom-up initiatives in the UK and top-down initiatives by local governments in Denmark have both contributed to fostering SC.[10)]

On the basis of the findings of previous studies, it is expected that participation in art festivals affect people's health directly and/or indirectly by building SC. However, to date, there has been little scientific research examining how participation in arts festivals affects residents' health.

The purpose of the current study is to evaluate the relationship between participating in arts festival activities and the health/SC of residents in Naoshima. We examined two hypotheses: (1) participating in the Setouchi Triennale was associated with the higher health of residents, and (2) participating in the Setouchi Triennale was associated with higher SC.

(1) Participation in the Setouchi Triennale and the Health of Residents in Naoshima

Purpose

The purpose of this study was to investigate the relationship between participation in arts festival activities at the Setouchi Triennale and the health of the residents in Naoshima Town using the SRH and K6 as outcome measures.

Methods

This was a cross-sectional study. The target population were residents of Naoshima Town, Kagawa Prefecture, Japan who were 20 years old or older as of September 1, 2021 (N = 2588). We surveyed participants from December 6, 2021, until March 31, 2022. Participants provided written informed consent and those who did not provide consent were excluded. We distributed self-administered questionnaires and collected them by mail.

As an exposure variable, we determined whether residents participated in activities related to the Setouchi Triennale.

As a primary outcome variable, self-rated health (SRH) was measured using a five-point Likert scale (1 = excellent; 2 = very good; 3 = good; 4= fair; 5 = poor).[11), 12)] Evidence has accumulated showing that SRH is associated with various physical and mental health conditions, and that it predicts mortality.[13)-17)] We dichotomized the responses into good health (very good/good/moderate) and poor health (bad/very bad).[11), 12)]

As a secondary outcome variable, the six-item Kessler Psychological Distress Scale (K6) was measured. The K6 is a self-administered questionnaire about a person's emotional state, with a total possible score of 24 points (range, 0−24 points) consisting of six items that are rated using a five-point Likert scale (0 = all of the time; 1 = most of the time; 2 = some of the time; 3= a little of the time; 4 = none of the time). The questions ask about how often the person has experienced specific symptoms (nervousness, hopelessness, restlessness/fidgeting, being so depressed that nothing could cheer them up, feeling that everything was an effort, and worthlessness) during the past 30 days. As in previous studies, respondents who scored higher than 13 were considered to have a serious mental illness when the items were coded as 0–4. On the basis of this cutoff point, a dichotomous variable was created as an indicator of serious psychological distress (0 = score 13 to 24 and 1 = score 0 to 12).[18)-21)]

In addition, we collected individual and demographic information, including sex, age, height, weight, smoking status, alcohol consumption, duration of residence in the community, number of people living together in the household, and subjective socioeconomic status (SES).

We first described demographic characteristics of the study participants by stratifying them according to whether they participated in the Setouchi Triennale or not. As the primary analysis, the

relationship between art festival activities participation and SRH was evaluated using logistic regression models. We first estimated the crude odds ratio (OR) and 95% confidence interval (CI), then estimated the OR and 95% CI after controlling for potential confounders as Models 2 and 3. In Model 2, we adjusted for sex, age, body mass index (BMI), SES, and number of people living together; in Model 3, we adjusted for smoking status and duration of residence. The secondary outcome K6 was analyzed in the same manner as the primary outcome. Stata SE version 17.0 (StataCorp, College Station, TX, USA) was used for all statistical analysis. This study has been approved by the Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences and the Okayama University Hospital Ethics Committee (approval number: K1902-003).

Results

We distributed questionnaires to the residents of Naoshima Town (N = 2588) who were 20 years old or older as of September 1, 2021, and received responses from 739 people (response rate = 28.6%). Of these, we excluded 31 for whom written informed consent was not obtained, and analyzed the remaining 708.

Table 1 shows demographic characteristics of the study participants by stratifying them according to whether they participated in art festival activities at the Setouchi Triennale or not. There was no clear difference between the two groups in SES, body mass index, and the number of people living together in the same household. The average age was 4.58 years older in the non-participation group compared with the participation group, and the average duration of residence in the community was 7.89 years longer. In addition, the participation group had almost the same ratio of males to females (49.49% males, 50.51% females), whereas the non-participation group had a slightly higher proportion of females (45.27% males, 54.73% females). The proportion of non-smokers was 9.74% higher in the participation group.

Table 2 shows the results of logistic regression analysis of the relationship between arts festival participation and SRH. The participation group had a crude OR of 2.11 (95% CI: 1.26–3.89) for higher SRH compared with the non-participation group. The table shows the results after adjusting for potential confounders. We observed a similar pattern of results after adjustment (Model 2: aOR=1.85, 95% CI [1.03-3.32], and Model 3: aOR=1.90, 95% CI [1.06- 3.42]).

Table 3 shows the results of logistic regression analysis of the relationship between arts festival participation and K6 scores. The participation group had a crude OR of 2.07 (95% CI: 0.87–4.90) for lower K6 scores compared with the non-participation group. After adjusting for potential confounders, we observed higher point estimation and a statistically significant association (Model 2: aOR=3.13, 95% CI [1.15-8.53], and Model 3: aOR=3.00, 95% CI [1.10-8.16]).

Table 1. Demographic characteristics of study participants in Naoshima Town (n =708).

		Non-participate in arts festival (n=599) [a]	Participate in arts festival (n=100) [a]
Sex, n (%)	(n=691)		
Male		268 (45.27)	49 (49.49)
Female		324 (54.73)	50 (50.51)
Age, years, mean (SD)	(n=681)	61.83 (18.07)	57.25 (19.04)
BMI, mean (SD)	(n=660)	23.17 (3.79)	22.53 (2.93)
Duration of residence, mean (SD)	(n=685)	46.53 (25.53)	38.64 (27.79)
SES, mean (SD)	(n=685)	5.21 (1.56)	4.90 (1.46)
Smoking, n (%)	(n=696)		
Non		368 (61.74)	52 (52)
Pre		177 (29.70)	37 (37)
Smoker		51 (8.56)	11 (11)
Number of people living together, mean (SD)	(n=688)	2.51 (1.29)	2.53 (1.40)

SD: standard deviation. BMI: Body mass index. SES: Subjective socioeconomic status. [a]There were missing data for 9 participants.

Table 2. The results of logistic regression analysis of arts festival participation for higher SRH.

	Model 1	Model 2	Model 3
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Non-participation in arts festival	1.00 (reference)	1.00 (reference)	1.00 (reference)
Participation in arts festival	2.11 (1.21 to 3.65)	1.85 (1.03 to 3.32)	1.90 (1.06 to 3.42)

Model 1 is crude model. Model 2 is adjusted for sex, age, body mass index (BMI), SES, and number of people living together. Model 3 is adjusted for sex, age, body mass index (BMI), SES, number of people living together smoking status and period of residence. SRH: self-rated health. OR: odds ratio. 95 % CI: 95 % confidence interval.

Table 3. The results of logistic regression analysis of arts festival participation for lower K6 scores.

	Model 1	Model 2	Model 3
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Non-participation in arts festival	1.00 (reference)	1.00 (reference)	1.00 (reference)
Participation in arts festival	2.07 (0.87 to 4.90)	3.13 (1.15 to 8.53)	3.00 (1.10 to 8.16)

Model 1 is crude model. Model 2 is adjusted for sex, age, body mass index (BMI), SES, and number of people living together. Model 3 is adjusted for sex, age, body mass index (BMI), SES, number of people living together smoking status and period of residence. K6: the 6-item Kessler Psychological Distress Scale. OR: odds ratio. 95 % CI: 95 % confidence interval.

Discussion

we evaluated the relationship between participation in arts festival activities at the Setouchi Triennale and the health of the residents in Naoshima Town using the SRH and K6 as outcome measures. The results suggested that participation in arts festival activities had a favorable impact on residents' health. Regarding generalizability and causality, caution is required in the interpretation of our study results. However, because few previous quantitative studies have examined the relationship between participation in arts festival activities and residents' health, the current study is considered to provide an important basis for further longitudinal research in the future.

(2) Does Participation in the Setouchi Triennale Foster Social Capital?

Purpose

The purpose of this study was to investigate the relationship between participation in the Setouchi Triennale as an exposure and using SC as an outcome factor adjusted by potential confounders.

Methods

This was a cross-sectional study. The target population were residents of Naoshima Town, Kagawa Prefecture, Japan who were 20 years old or older as of September 1, 2021 (N = 2588). We surveyed participants from December 6, 2021, until March 31, 2022. Participants provided written informed consent and those who did not provide consent were excluded. We distributed self-administered questionnaires and collected them by mail. This study has been approved by the Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences and the Okayama University Hospital Ethics Committee (approval number: K2110-023).

SC has a cognitive aspect, which refers to subjective aspects, such as perceptions and values (e.g., trust and reciprocity), and a structural aspect; the latter refers to people's connections and social

networks, which can be objectively verified through actual behavioral observations and records (e.g., participating in community activities).[23] In the structural dimension, a distinction is made between bonding SC, which refers to trust and cooperation among members of networks with similar social identities (e.g., race, ethnicity), and bridging SC, which signifies connections among individuals whose social identities are dissimilar.[24] Bonding SC is exclusive, strengthening ties within homogeneous, socially similar groups and enhancing access to internal resources; by contrast, bridging SC is inclusive, strengthening ties among heterogeneous, socially diverse groups and enhancing access to external resources.[25]

Propensity score matching seeks to balance covariates across comparison groups (here, participation versus nonparticipation in the Setouchi Triennale) by matching individuals regarding their probability (propensity) to participate in the art project. To calculate the propensity scores, we applied 11 covariates (sex, age, BMI, smoking status, alcohol consumption, length of residence, education, hospital visit, marital status, Number of cohabitants, source of income). We applied logistic regression analysis to calculate the propensity score. We then used ordered logistic regression analysis to examine the relationships between participating in the Setouchi Triennale and cognitive or structural SC; we used subjects in the lowest cognitive or structural SC category as the reference group. We established model 1 as a crude model. In model 2, we adjusted for the above-listed 11 covariates. For model 3, we conducted a conditional ordered logistic regression analysis to compare the outcomes between matched pairs. We calculated adjusted odds ratios (aORs) and 95% confidence intervals (CIs). We used STATA/SE17.0 (StataCorp, College Station, TX, USA) for all statistical analyses; we set statistical significance at $p < .05$.

Results

The demographic data appear in Table 4. Of the respondents, 53.5% were women and 45.0% were men. The mean age was 61.3 years (standard deviation [SD], 18.3); the mean BMI was 23.2 (SD, 5.16); 8.6% of respondents were smokers; 47.7% consumed alcohol.

Participation in the Setouchi Triennale was significantly associated with higher levels of cognitive and structural SC. (Tables 5 and 6)

Table 4. Characteristics of the Analytic Sample

	Total(n=706)			
	No.	%	Mean	SD
Sex				
Male	318	45.0		
Female	378	53.5		
Other	5	0.7		
Missing	5	0.7		
Age	688		61.3	18.27
BMI	666		23.2	5.16
Smoking status				
Non-smoker	640	90.7		
Smoker	61	8.6		
Missing	5	0.7		
Alcohol consumption				
Non-drinker	363	51.4		
Drinker	337	47.7		
Missing	6	0.9		
Length of Residence on Naoshima			45.5	25.96
Education				
Primary/Junior high school/High school	438	62.0		
Vocational school/University/Graduate school/Other	255	36.1		
Missing	13	1.8		
Regular hospital visits				
Yes	429	60.8		
No	272	38.5		
Missing	5	0.7		
Marital status				
Unmarried	102	14.5		
Married	592	83.9		
Missing	12	1.7		

Number of cohabitants		
1	136	19.3
2	285	40.4
3≦	280	39.7
Missing	5	0.7
Source of income		
Social security benefits	282	39.9
Own income	265	37.5
Family income/Other	111	15.7
Missing	48	6.8
SES		
Low(1≦, <5)	205	29.0
Middle（5）	328	46.5
High(5<)	158	22.4
Missing	15	2.1
Art project		
Participation	100	14.2
Non-participation	597	84.6

SD: standard deviation. BMI: Body mass index. SES: Subjective socioeconomic status

Table 5. The odds ratios of Cognitive Social capital by Participate in art project

	Model 1（n=693）		Model 2（n=600）		Model 3（n=356）	
	OR	［95%CI］	OR	［95%CI］	OR	［95%CI］
Cognitive Social capital	2.807	[1.884,4.182]	3.035	[1.935,4.761]	2.913	[1.846,4.596]
Trust	3.226	[1.821,5.717]	3.467	[1.816,6.618]	2.547	[1.341,4.838]
Reciprocity	2.069	[1.373,3.119]	2.377	[1.493,3.784]	2.373	[1.488,3.783]

Model 1: crude. Model 2: adjusted by sex, age, BMI, smoking status, alcohol consumption, length of residence, education, hospital visits, marital status, number of cohabitants, source of income. Model 3 adjusted by propensity score. OR: odds ratio. 95 % CI: 95 % confidence interval.

Table 6. The odds ratios of Structural Social capital by Participate in art project

	Model 1（n= 685）		Model 2（n=592）		Model 3（n=344）	
	OR	［95%CI］	OR	［95%CI］	OR	［95%CI］
Structural Social capital	4.608	[3.053,6.954]	5.575	[3.496,8.893]	4.535	[2.839,7.244]
Bonding Social capital	2.130	[1.339,3.388]	2.626	[1.533,4.501]	3.013	[1.758,5.164]
Bridging Social capital	3.776	[2.521,5.654]	4.204	[2.645,6.683]	3.430	[2.172,5.415]

Model 1: crude. Model 2: adjusted by sex, age, BMI, smoking status, alcohol consumption, length of residence, education, hospital visits, marital status, number of cohabitants, source of income. Model 3 adjusted by propensity score. OR: odds ratio. 95 % CI: 95 % confidence interval.

Discussion

This study examined the hypothesis that participating in the Setouchi Triennale was associated with higher levels of cognitive and structural SC. These results support our a priori hypothesis. Art project participation demonstrated the potential to foster cognitive or structural SC in the community.

This investigation has several limitations. First, it was a cross-sectional study; thus, caution must be exercised regarding the causal relationship between Setouchi Triennale participation and social capital. Second, the response rate for the survey was not high: our results should be interpreted guardedly in terms of generalizability. Third, there is the issue of common method bias. We measured both project participation as an exposure and social capital as an outcome subjectively by using the questionnaire: it is possible that the association was overestimated. In future research, longitudinal surveys are warranted to clarify the relationship between art project participation and building social capital.

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