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Trust in the Mass Media and the Healthcare System, Interpersonal Trust and Self-Rated Health: A Population-Based Study in Japan

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Abstract: To investigate the relationship between trust in the mass media and self-rated health, we analyzed cross-sectional data of the Japanese population, using a logistic regression adjusted for age, gender, marital status, income, education, occupation, interpersonal trust and trust in the healthcare system. In a total of 2685 participants, 962 (35.8%) were classified as being in poor health. There were 737 (27.4%) with distrust in the mass media. In the adjusted model, distrust in the mass media was significantly associated with poor health with an odds ratio of 1.348 (95% CI, 1.078 to 1.687). Distrust in the healthcare system and interpersonal distrust was also associated with poor health. In conclusion, distrust in the mass media is significantly associated with poor health. Since the mass media is likely to be an important resource for health promotion, quality in media contents needs more improvement to enhance public trust for making people healthier.

Key words: Vertical trust, institutional trust, health, healthcare system, mass media

INTRODUCTION

Increasing attention is being paid to social capital as an important determinant of health. Social capital was developed as a concept to indicate the quantity and quality of social interactions in a community (Petrou and Kupek, 2007). A society with high levels of social capital has high social participation among its citizens, high interpersonal trust and high levels of institutional trust (Putnam, 1993, 2000). Studies suggest that better social capital has positive effects on various aspects of physical and psychological health (Helliwell and Putnam, 2004; Yip *et al*., 2007). Social capital promotes health by affective support, mutual respect, better access to local services, social control of deviant behavior and violence and enhanced transmission of health information and healthy behavior (Kawachi *et al*., 1999).

Social capital is most often assessed as social participation or trust (Putnam, 1993). Recent studies suggest that a society of high social participation but with low trust reflects the miniaturization of community, which is shown to be associated with high-risk behaviors (Lindstrom, 2003, 2004, 2005; Lindstrom and Axen, 2004). There is growing interest in trust as a more important social determinant for health (Antonucci *et al*., 1997; Berkman, 1995; Di Tella *et al*., 2003; Helliwell, 2003). Trust is a belief that the sincerity or good will of others can generally be considered reliable (Rotter, 1967). High trust and cooperation enhance each other and then promote an accumulation of social capital (Putnam, 1993). Trust can be divided into horizontal (interpersonal) trust and vertical (institutional) trust (Putnam, 1993) and includes the expectation that an individual or institution will act competently, fairly, openly and with concern (Gilson, 2003). Development of the capacity to trust others is an essential element for developing an integrated personality and successful social adjustment (Suedfeld *et al*., 2005) and is considered an important predictor of health and psychological well-being (Barefoot *et al*., 1998; Layard, 2005).

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Vertical trust considers the public institutions of society and the levels of trust may vary between societies based on the level of social connectedness (Mohseni and Lindstrom, 2007). For instance, the healthcare system is an institution and vertical distrust in the healthcare system is shown to be associated with poor health (Mohseni and Lindstrom, 2007). Patients with distrust in the healthcare system may not access healthcare services, may not have access to important medical information and may not adhere to physicians' advice and prescriptions.

In addition to the healthcare system, the mass media is also considered as one of the public institutions of society and may affect public health through the levels of trust that people have in the media. There are a few studies to date which explore the relationship of health-related issues and trust in the mass media. A recent study, conducted in Sweden, showed that vertical distrust in the mass media is not associated with smoking behavior (Lindstrom and Janzon, 2007), but it is associated with lower odds of smoking (Lindstrom and Janzon, 2007).

Vertical distrust in the mass media may still be a possible, important determinant of health. Since the issue of vertical distrust has not been investigated before, it is unclear whether distrust in the mass media is related to poor self-rated health. In this study, we evaluated the association between distrust in the mass media and poor health among the Japanese people, using data from the Asia Barometer Survey, a multinational and multidimensional survey conducted in Asia.

MATERIALS AND METHODS

Study Participants

Ethics committee approval from the Chuo University was obtained prior to beginning the study. We retrospectively combined data from 3 cross-sectional surveys conducted in Japan in 2003, 2004 and 2006, as a part of the Asia Barometer Survey (Inoguchi, 2005). The Field Reports of the Asia Barometer Survey can be found in the website at https://www.asiabarometer.org/. We classified all municipalities in Japan into 5 regions, including Hokkaido and Tohoku, Kanto, Chubu and Hokuriku, Kinki and Chugoku, Shikoku and Kyushu. In each region, municipalities were stratified into 5 categories corresponding to their population sizes, as follows: (1) 12 metropolises: Sapporo, Sendai, Chiba, Tokyo (metropolitan area), Yokohama, Kawasaki, Nagoya, Osaka, Kobe, Hiroshima, Kita-Kyushu and Fukuoka. (2) Cities with a population greater than 150,000 (3) Cities with a population between 50,000 and 150,000 (4) Cities with a population less than 50,000 and (5) Towns and villages. All municipalities in Japan were stratified into 25 blocks. Within each block, primary sampling units (census tracts) were randomly chosen through probability proportionate to the size sampling. Finally, 10 individuals were randomly chosen from each resident registration ledger of the census tracts. We obtained written informed consent from all participants.

Data Collection

The Asia Barometer Survey used face-to-face interviews to provide structured questionnaires. The descriptive contents of the questionnaires were previously published elsewhere (Inoguchi, 2005). Data collection included demographics, marital status, socioeconomic factors (income, education and occupation), self-rated health, interpersonal trust and trust in the healthcare system and the mass media, in addition to information on political, environmental and daily-life issues, which were related to the Asia Barometer Survey.

Age was categorized into 5 groups of 20-29, 30-39, 40-49, 50-59 and 60-69 years old. Categories of marital status included: married/partnered; single; divorced; separated; or widowed. Annual household income was used as an income variable in this study. The low-income group included participants with an annual household income of less than 5 million Japanese yen. The mid-income group included those with an income from 5 million yen to less than 8 million yen. The high-income group included those with an income of 8 million yen or greater (The average exchange rates to 1 US dollar in 2003, 2004 and 2006 were 113, 108 and 117 Japanese yen, respectively).

For educational attainment, the low-education group included participants who had completed primary school or junior high school. The mid-education group included participants who had completed high school. The high-education group included participants who had completed technical school, college, university or graduate schools.

For occupational status, 3 categorical levels were used, including self-employed, employed, or unemployed. The self-employed group included: (1) self-employed in agriculture, forestry or fisheries, (2) business owner in mining or manufacturing industry of an organization with up to 30 employees, (3) vendor or street trader, (4) business owner or manager of an organization and (5) self-employed professional. The employed group included: (1) senior manager, (2) employed professional or specialist, (3) clerical worker, (4) sales, (5) manual worker, (6) driver and (7) other worker. The unemployed group included: (1) homemaker, (2) student, (3) retired and (4) unemployed.

In this study, self-rated health was defined as the individual's personal satisfaction with their overall health. In the survey, we asked, Please tell me how satisfied or dissatisfied you are with your health? Would say you are very satisfied, somewhat satisfied, neither satisfied nor dissatisfied, somewhat dissatisfied, or, very dissatisfied with your health? These categories were collapsed to form a dichotomous outcome of self-rated health: poor health (1) for very dissatisfied, somewhat dissatisfied, or neither satisfied nor dissatisfied; and good health (0) for very satisfied, or somewhat satisfied.

For measuring interpersonal trust, we asked: "Would you say that 1) most people can be trusted; or do you think 2) you can't be too careful in dealing with people?" The response was dichotomized with the choice of the first sentence as having trust and the second sentence as distrust. Trust in institutions (vertical trust) is an item that reflects the participant's trust in the healthcare system and in the mass media (specified as newspapers and television).

The item 'please indicate to what extent you trust the following institutions to operate in the best interests of society offered the alternatives: (a) the healthcare system, (b) the mass media, with six alternative responses: (1) 'Trust a lot, (2) Trust to a degree, (3) Don't really trust, (4) Don't trust at all, (5) Haven't thought about it and (6) I don't know. These responses were collapsed to form a dichotomous variable: trust (0) for the first two responses; and distrust (1) for the third and fourth responses. Other responses were considered as unavailable data (N/A) and the sample with (N/A) data were excluded from a multivariable analysis.

Statistical Analysis

Descriptive statistics were calculated and presented as the mean with standard deviation, or the count number with proportion to the overall sample population where appropriate. Univariate analysis was performed by Chi-Square test. Bivariate analysis was conducted by Spearman's correlation coefficients. A logistic regression model was used for evaluating the relations of trust in the healthcare system and in the mass media to self-rated health, adjusted for age, gender, marital status, income, education, occupation and interpersonal trust. The Odds Ratios (OR) along with 95% Confidence Interval (CI) were estimated in each variable for poor health. The OR values greater than one indicate greater effects that were positively related to poor health. All statistical analysis was performed using SPSS 15.0J (SPSS Japan, Tokyo, Japan). Two-tailed $p<0.05$ were considered statistically significant.

RESULTS

Using cross-sectional data from 3 surveys conducted among the Japanese people in 2003, 2004 and 2006, as a part of the Asia Barometer Survey, we obtained a response rate of 58.5% from eligible persons. The final sample size of this study was 2685 participants. Table 1 shows the characteristics of the participants. The mean age was 42.7 years old (standard deviation, 12.4) and 47.5% were men.

Table 1: Characteristics of the participants

Characteristics	N = 2685	
Age		
20-29	470	17.5
30-39	682	25.4
40-49	605	22.5
50-59	741	27.6
60-69	187	7.0
Gender		
Male	1276	47.5
Female	1409	52.5
Martial status		
Married/partnered	2015	75.0
Others*	670	25.0
N/A	1	0.01
Income		
High	433	16.1
Mid	672	25.0
Low	1047	39.0
N/A	533	19.9
Education		
High	1284	47.8
Mid	1190	44.3
Low	200	7.4
N/A	11	0.4
Occupation		
Self-employed	337	12.6
Employed	1577	58.7
Unemployed	762	28.4
N/A	9	0.3
Interpersonal trust		
Trust	1102	41.0
Distrust	1490	55.5
N/A	93	3.5
Trust in the health care system		
Trust	1457	54.3
Distrust	1066	39.7
N/A	162	6.0
Trust in the mass media		
Trust	1659	61.8
Distrust	737	27.4
N/A	289	10.8
Self-rated health		
Good	1718	64.0
Poor	962	35.8
N/A	8	0.2

Values are given as No. (%), *: Others include single, divorced, separated, or widowed, N/A: Data not available or no opinion

Of the 2685 participants, 2015 (75.0%) participants were married and partnered. A majority (58.7%) of the participants were in the employed status category. The group of low educational attainment comprised the smallest portion (7.4%) of the total participants.

For the question involving interpersonal trust, 1490 (55.5%) participants reported that they can't be too careful in dealing with people while 1102 (41.0%) participants reported that most people can be trusted. For the question involving trust in the healthcare system and the mass media, 1066 (39.7%) participants were classified as having distrust in the healthcare system and 737 (27.4%) participants were classified as having distrust in the mass media. In the 2685 participants, 962 (35.8%) were classified as being in poor health, based on the questionnaire for self-rated health.

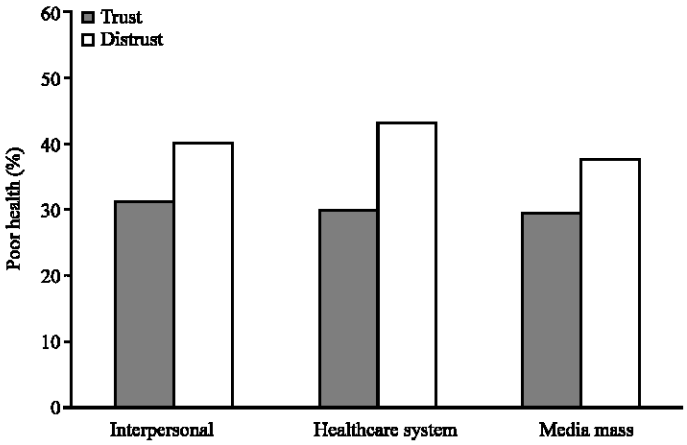

Fig. 1: Relationship between levels of various trust variables and poor health

Table 2: Multivariable-adjusted logistic regression model for poor health

		95% CI of OR		
Variables	OR	Lower value	Upper value	p-value
Age				
20-29 (reference)	1.000			
30-39	1.465	1.040	2.064	0.0290
40-49	1.929	1.340	2.760	0.0003
50-59	1.920	1.354	2.724	0.2290
60-69	2.356	0.826	2.226	0.2290
Gender				
Male (reference)	1.000			
Female	1.597	1.282	1.988	<0.0001
Martial status				
Married/partnered (reference)	1.000			
Others*	1.603	1.237	2.075	0.0003
Income				
High (reference)	1.000			
Mid	1.086	0.848	1.392	0.5132
Low	1.020	0.789	1.318	0.8806
Education				
High (reference)	1.000			
Mid	1.382	1.117	1.710	0.0029
Low	1.557	1.013	2.393	0.0436
Occupation				
Self-employed (reference)	1.000			
Employed	1.152	0.850	1.561	0.3605
Unemployed	1.460	1.018	2.092	1.0395
Interpersonal trust				
Trust (reference)	1.000			
Distrust	1.373	1.123	1.678	0.0020
Trust in the health care system				
Trust (reference)	1.000			
Distrust	1.584	1.294	1.940	<0.0001
Trust in the mass media				
Trust (reference)	1.000			
Distrust	1.348	1.078	1.687	0.0089

OR: Odds Ratio, Ci: Confidence Interval, *: Others include single, divorced, separated, or widowed

Bivariate correlation analyses were conducted among the three trust variables using Spearman's correlation coefficients. The correlation coefficient between trust in the healthcare system and trust

in the mass media was 0.251 ($p<0.001$). The correlation coefficients between interpersonal trust and trust in the healthcare system and interpersonal trust and trust in the mass media were 0.083 and 0.093, respectively ($p<0.001$ for both).

Figure 1 shows the relationships of trust in the healthcare system and the mass media to poor health. For interpersonal trust, 30.9% participants with trust and 39.8% with distrust had poor health and there was significant univariate difference of poor health between them ($p<0.001$). For trust in the healthcare system, 29.9% of participants with trust and 43.1% with distrust had poor health, with a significant univariate difference at $p<0.001$. Additionally, for trust in the mass media, 29.3% participants with trust and 37.6% with distrust had poor health, with a significant univariate difference at $p<0.001$.

Table 2 shows the results from the logistic regression for poor health, adjusted for age, gender, marital status, income, education, occupation, interpersonal trust and trust in the healthcare system and the mass media. Interpersonal distrust was significantly associated with poor health, with an OR of 1.373 (95% CI, 1.123 to 1.678). Distrust both in the healthcare system and in the mass media was also significantly and independently associated with poor health, with an OR of 1.584 (95% CI, 1.294 to 1.940) and 1.348 (95% CI, 1.078 to 1.687), respectively.

There were other socio-demographic variables which were significantly associated with poor health, including, age of 30-39 years (OR 1.465; 95% CI, 1.040 to 2.064), age of 40-49 years (OR 1.929; 95% CI, 1.349 to 2.760), age of 50-59 years (OR 1.920; 95% CI, 1.354 to 2.724), male gender (OR 1.597; 95% CI, 1.283 to 1.988), marital status other than married/partnered (OR 1.603; 95% CI, 1.237 to 2.075), mid-education (OR 1.382; 95% CI, 1.117 to 1.710), low education (OR 1.557; 95% CI, 1.013 to 2.393) and unemployment (OR 1.460; 95% CI, 1.018 to 2.092). Income was not associated with poor health.

DISCUSSION

The results of the current study suggest that vertical trust in the mass media is significantly associated with self-rated health. Trust in the mass media remains significantly associated with health, even after multivariable-adjusted regression modeling. Similar to previous studies, this study also shows significant associations between horizontal (interpersonal) trust and self-rated health and vertical (institutional) trust and health. Although the current study has inferential limits for direction of causality due to the cross-sectional design, the interpretation could be that the mass media may be able to influence health status. There seems to be great potential for trust in the mass media in the general population that could be utilized for promoting health.

The mass media may have beneficial effects on people's health by providing useful information on health through educational campaigns, series programs and advertisements. Well-designed mass media campaigns can have beneficial effects not only on health knowledge and attitudes, but also on behaviors, which can translate into a major public health impact given the wide reach of the mass media (Noar, 2006). Television advertising is associated with significant increases in public knowledge and awareness of the important early symptoms of potentially fatal acute diseases. For example, TV advertising of information on the warning symptoms of stroke in Ontario, Canada increased emergency department presentations of patients with early stage stroke and provided an opportunity for the administration of potentially life-saving thrombolytic therapy only indicated in the early hours after stroke onset (Hodgson *et al*., 2007; Silver *et al*., 2003). A study among US Massachusetts residents showed that TV advertisements were the most frequently mentioned source of help among recent smokers who quit (Biener *et al*., 2006). Multiple studies show that media campaigns stimulate improvements in attitudes toward healthy behaviors, such as better diet, exercise, drug prevention and safe sex, in addition to smoking cessation (Beaudoin *et al*., 2007; Carver *et al*.,

2003; Escobar-Chaves *et al*., 2005; Evans *et al*., 2004; Farrelly *et al*., 2005; Huhman *et al*., 2005; Stephenson, 2003; Wray *et al*., 2005). The recent WHO reports on developing countries (The effectiveness of mass media in changing HIV/AIDS-related behavior among young people in developing countries, Bertrand and Anhang, 2006) also support the effectiveness of mass media interventions to increase the knowledge of HIV transmission, to influence some social norms, to increase the amount of interpersonal communication and to boost awareness of health providers (Bertrand and Anhang, 2006).

Mass media campaigns can have beneficial effects on public health, because the mass media, particularly newspaper and television, can reach population-wide consumers throughout the country. In Japan, the first nationwide newspaper Yomiuri was started in 1874 (Yamaguchi *et al*., 2007). Since then, an increasing number of Japanese people have subscribed to a newspaper and owned a television. In Japan, there is a total circulation of 52,310,000 copies (October, 2006) of all newspapers every day (634.5 copies per 1000 adults) and the country ranks second only to Switzerland (795.7 copies per 1000 adults) in the world (Yamaguchi *et al*., 2007). Additionally, the Japanese newspaper subscription is characterized by regular home delivery service (94.32%). A nationwide survey indicates that 94.5% of all adult respondents report that they read some articles in a newspaper and the average weekday reading time is 26.2 min per adult per day (Yamaguchi *et al*., 2007). Newspapers are considered as a major source for the general public to obtain health information in Japan (Sato, 2003; Shinada *et al*., 2002). In addition, the Japanese people seem to like to watch TV. The household saturation level of TV ownership is almost 100% and the average TV watching time is about 4 hours per person per day, based on data from 2004 (Yamaguchi *et al*., 2007). Thus, TVS can be also as a major source for the general public to obtain health information in Japan.

Although the mass media affects health status, disparities in exposure to health-related mass media messages may be one of the contributing factors to an imbalance in health outcomes. In order to survive in the competitive environment of fragmented audiences, the mass media in TV and publishing, especially magazine publishers, tend to engage in audience segmentation (Picard, 1999). In an US study, compared to readers of Caucasian magazines, readers of magazines for ethnic minorities are exposed to fewer health-promoting advertisements and more health-diminishing advertisements (Duerksen *et al*., 2005). Photographs of role models in ethnic minority magazines are more often used to advertise products with negative health impacts, while the reverse is true of role models in the Caucasian magazines (Duerksen *et al*., 2005). Variations in the quantity and content of health-related information in the mass media for different subpopulations may contribute to disparities in health behaviors and status.

In contrast, the mass media are known to sometimes create adverse effects on public health (Ishida *et al*., 1998; Kanda *et al*., 2006; Sone, 1999; Sugimori *et al*., 2004). These findings probably forced people not to trust the mass media. Recently, one of the most popular TV programs related to health in Japan, Aru Aru Daijiten infotainment, faced public scrutiny due to fraudulent concoction of data (Cyranoski, 2007). The producers of the program also misrepresented the words of scientists. After a public outcry, the TV network cancelled the series and submitted all previous episodes to government agency for review (Cyranoski, 2007). Economic pressure to entertain audiences has probably reduced the quality of TV programs by the mass media. The mass media need to learn from the TV network scandal and strive to tell people the truth based on scientific evidence in order to recover the trust of their audiences.

There are several strengths of present study. In our review of the literature, this may be the first study to show a significant association between trust in the mass media and health. Over 70% of the participants in the current study report trust in the mass media. With the high level penetration of the mass media throughout the country, these findings may partly contribute to the fact that Japanese are among the healthiest people with the highest life expectancy and the longest healthy longevity in the world.

Present results are based on a multivariable model adjusted for potential confounders, such as demographic and socioeconomic factors. In evaluating the relationship between trust and well-being, these factors should be adjusted to avoid confounding effects. In particular, individuals with higher socioeconomic status may perceive their societies as less hostile and friendly, compared with those with lower socioeconomic status (Gallo *et al*., 2006). Socioeconomic status is also related to health status as shown in the current study (Poortinga, 2006), as confirmed in the current study. Marital status is associated with an individual's health and may be related to social trust (Helliwell and Putnam, 2004). Taken together, any one of the factors of socioeconomic status (education, income and job) and marital status may confound the observed association between trust and health. Present results based on the adjusted model are more reliable for estimating the possible association between trust and health.

We also assessed the potential association between sociodemographic factors and health, after accounting for horizontal and vertical trust. The results of our study confirmed previous reports that found several factors that influenced health: Including age, male gender, marital conflict, unemployment, low education, interpersonal trust and trust in the healthcare system (Helliwell and Putnam, 2004; Kawachi *et al*., 1999; Subramanian *et al*., 2005). In contrast, income was not associated with happiness in our study. Therefore, the typical unhealthy Japanese may be a male in mid-life, single (or divorced, separated, or widowed), with a low education, unemployed and interpersonal distrust as well as distrust in the healthcare system and the mass media.

Present study is based on the analysis of cross sectional data and therefore it has inferential limits. It may also be possible that poor health leads to social isolation and distrust in any institutions due to psychosocial mechanisms. It may also be possible that health and trust may reflect different facets of a common underlying construct, such as general psychological well-being. Accumulated evidence now indicates that both horizontal trust and vertical trust are critical determinants for health (Lindstrom and Janzon, 2007; Mohseni and Lindstrom, 2007). Since trust in the mass media can be an important social attitude, the link between trust in the mass media and health can be included in this context.

In conclusion, this study is the first to investigate the relationship between vertical trust in the mass media and self-rated health. The results of the current study indicate that individuals with distrust in the mass media have poor self-rated health. Health promotion programs in the mass media can increase health knowledge and enhance health beliefs, which in turn contribute to healthy behaviors among the people who trust in the mass media. To improve trust in the mass media among people, the mass media need to review the previous adverse events leading to public distrust and also need to recognize the importance of their social role for public health. Further research may be needed to generalize this finding to people in other countries. In addition, an important task in future research and public policy would be to identify characteristics of high quality programs which the public can trust and to encourage the mass media to produce these programs for better public health.

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