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Individual-level social capital and self-rated health in Japan: An application of the Resource Generator

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ABSTRACT

Despite accumulating evidence of associations between social capital and health in public health research, a criticism of the field has been that researchers have exclusively focused on concepts of social cohesion to the exclusion of individual-level approaches. In the present study, we evaluated the association between social capital measured by the Resource Generator (an individual-level assessment of access to social capital) and self-rated health among Japanese population in a cross-sectional study. A postal survey of 4000 randomly selected residents in Okayama City (western Japan) was conducted in February 2009. We divided the overall scores from the Resource Generator Japan scale into quartiles. Odds ratios (ORs) and 95% confidence intervals (CIs) for self-rated health were calculated separately by sex. Individuals with the highest quartile of scores had significantly lower odds of poor health compared to the lowest group after covariate adjustment among both men and women (men; OR: 0.45, 95% CI: 0.24–0.86, women; OR: 0.44, 95% CI: 0.25–0.79, respectively) and there were also significant dose–response relationships. In the sub-domains of Resource Generator Japan scale, a differential pattern was observed by sex. Women showed a clear dose–response relationship with health across all four sub-scales (domestic resources, expert advice, personal skills, and problem solving resources). In contrast, only the domain of expert advice exhibited a strong association with men's health. Among both men and women individual-level social capital measured by the Resource Generator was related to reduced odds of poor health even after taking into account individual confounders. Although we cannot exclude reverse causation due to the cross-sectional design, our study adds to the accumulating evidence of the potential utility of the Resource Generator for evaluating the relationship between individual-level access to social capital and health.

Introduction

The public health literature on "social capital" has overwhelmingly focused on social cohesion – i.e., community norms of trust or reciprocity – as a determinant of population health (Kawachi, Kim, Coutts, & Subramanian, 2004). With this approach, researchers have sought to demonstrate the health benefits (and health penalties) accruing to individuals as a consequence of their membership of close-knit groups. Conceptualized in this manner, social capital is treated as an ecological or group characteristic, and multi-level analysis has been typically used to identify the contextual influence of social capital on health. Indicators of social capital in this manner include moral resources such as trust and reciprocity that the individual can access through membership of the collective.

On the other hand, the methodology of individual social capital based on social network approach has been hampered by offering diverse measures (e.g., social network structure, presence of specific alters, size and diversity of networks, and exchange of social resources) that tap into different dimensions of social capital (Flap, 1999; Lin, 2001; Van der Gaag & Webber, 2008). Of these, we now focus on social resources as the indicators of individual social capital in the present study. To date, three main measurement instruments for individual social capital have been described and applied in public health research: Name Generator (McCallister

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et al., 1978; Marsden, 1987), Position Generator (Lin et al., 1986, 2001), and Resource Generator (Snijders, 1999; Van der Gaag & Snijders, 2005).

Lin's Position Generator is perhaps the most frequently used survey instrument for the measurement of individual social capital (Van der Gaag, Snijders, & Flap, 2008). The advantage of the Position Generator (which it shares with the Resource Generator) is that the instrument does not require mapping the whole social network and therefore saves time. The Position Generator inquires about each respondent's connection to others who hold "valued" occupations such as doctor, banker, lawyer, and college admissions officer (Van der Gaag & Webber, 2008). In other words, the Position Generator is specifically designed for the measurement of access to social resources useful in *instrumental* actions, i.e., "getting ahead" in life. The Position Generator is then used to construct network resource indexes such as heterogeneity (akin to the concept of bridging social capital), "upper reachability" (akin to the concept of linking social capital) (Lin et al., 2001). The limitation of the Position Generator is the list of prestigious occupations with embedded "value" is likely to be: a) culturally contingent (for example, knowing a lawyer is not as critical in Japan compared to the United States which tends to be more litigious); and b) situation-specific (e.g., it is more important to know a plumber than a surgeon if your toilet happens to break down on a weekend). Moreover, the Position Generator is not explicit about the *types* of resources that are accessed through social connections; it is simply assumed that being acquainted with others who hold valued occupations leads to the ability to access information, prestige or other instrumental resources (Van der Gaag & Webber, 2008).

In contrast to the Position Generator, the Resource Generator adopts a checklist approach to inquire about the specific resources that respondents have access to through their networks (Van der Gaag & Webber, 2008). Therefore its main advantage over the Position Generator seems to be that it inquires about specific domains of domestic resources – viz. expert advice, personal skills, and problem solving resources – which may have relevance for health promotion. A limitation of the Resource Generator is the kind of resources/favors one commonly ask of friends tends to vary by culture.

A previous study reported that presence of common mental disorder (12 item General Health Questionnaire scores $\geq$5) was inversely associated with social capital as measured by the Resource Generator in a UK sample (Webber & Huxley, 2007). On the other hand, a six-month prospective cohort study among 193 individuals with depression in UK reported that the Resource Generator had no independent effect on the course of depression measured with the Hospital Anxiety and Depression scale (Webber, Huxley, & Harris, 2011). Based on these two previous studies, the evidence linking social capital measured with the Resource Generator to health outcomes remains sparse and inconsistent. On the other hand, a growing amount of evidence has suggested significant associations between social capital using the Position Generator and self-rated health (Carpiano et al., 2011; Moore et al., 2011; Song et al., 2009; Verhaeghe, Pattyn, Bracke, Verhaeghe, & Van De Putte, 2012), or mental health (Song et al., 2009), although the mechanism linking network social capital and health is still unclear. In the present study, we cannot examine the prospective association between social capital and health due to the cross-sectional design. However, as self-rated health has been established as a robust predictor of mortality (Idler et al., 1997), we expected that it would provide an additional test of the association between social capital and health. In addition, one could argue that self-rated health might be temporarily influenced by health status such as mental distress. Therefore, we hypothesized that individual-level social capital as measured with Resource Generator could be associated with self-rated health among a Japanese population, assuming mental distress as a mediator between social capital and self-rated health.

Furthermore, a recent study in Sweden suggested gender differences in the associations between social capital and self-rated health due to cultural beliefs that men and women are expected to behave differently (Eriksson, Ng, Weinehall, & Emmelin, 2011). In Japanese society, women spend more time in the home environment compared to men, while men spend more time in their workplaces and socialize outside work with their (mainly male) colleagues. In this sense, as home-makers are not formally classifiable based on occupational prestige-based scales (such as the Position Generator), but are nonetheless indispensable network members to people, we hypothesized that health status among women would be more closely linked to responses to the Resource Generator than men. That is, when applied to the identification of specific domains of social capital that promote health, we hypothesized that the Resource Generator would be more closely tied to the health of women than men (compared to the Position Generator). Indeed, as social resources are dependent on the cultural context, it is important to examine gender difference in the effects of social capital as measured with Resource Generator and test whether this concept can be applied to non-Western populations.

Methods

Participants

The study was based on the Okayama Social Capital Survey conducted by the City Government of Okayama in February 2009 (Iwase et al., 2012; Ueshima et al., 2010). Okayama is a mid-sized city with a total adult (aged 20–80 years) population of 518,758 (City Government of Okayama, 2009). The postal survey of 4000 residents of that city used a two-stage random sampling design to select 20 elementary school districts out of 87. Within each school district, 200 residents aged 20–80 years were selected using the residential registry managed by the national and prefectural government as the sampling frame. Of the 4000 subjects, 61 were considered non-eligible (they were deceased or had changed address during the intervening time between selection and postal delivery). Of the remaining 3939 subjects, 2260 returned the questionnaires and thus the response rate was 56.5%. We excluded subjects who did not respond to the questionnaire items on age (n = 95), sex (n = 73), self-rated health (n = 69), and any items belonging to the Resource Generator (n = 391). Finally, 1775 study subjects (740 men and 1035 women) were included in the analysis.

The study protocol was reviewed and approved by the Institutional Review Board at the Harvard School of Public Health (protocol#18977-101).

Measures

We measured social capital with the Resource Generator Japan scale (RG-J scale) based on Resource Generator UK scale (RG-UK scale), of which the validity and reliability has been established using a non-parametric item response theory method to form one-dimensional scales within sets of items (Webber & Huxley, 2007). It comprised 27 items, and responses to individual items were dichotomized (0 = No, 1 = Yes). Of the 27 items, two items were dropped because they were felt to be inapplicable to the Japanese context "(I know someone who) can repair a broken-down car" (item 17) and "can speak another language fluently" (item 23). Therefore, we modified these 2 items after consultation with an expert panel as follows; item 17 was "(I know someone who can)