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Relation between social network and psychological distress among middle-aged adults in Japan: Evidence from a national longitudinal survey

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ABSTRACT

It is widely documented that psychological distress is negatively associated with social networks involvement. However, despite the theoretical postulations that social networks are crucial for alleviating psychological distress, no study has yet empirically confirmed the causality of this relationship. Thus, we used the random-effects generalized least squares method to investigate the effect of one- and two-year lagged values for involvement in social networks on psychological distress. Nine years of longitudinal data were extracted from a nationally representative survey in Japan ("The Longitudinal Survey of Middle-aged and Older Persons"). We utilized the Kessler 6 (K6) score to measure psychological distress among 15,242 respondents aged 50—59 years in the baseline year (2005), and stratified participants into three layers of social networks: inner (well-established friendship ties and participating in hobby activities), intermediary (neighborly ties), and outer (involvement in community activities). We found highly significant and negative associations between all three layers and K6 scores, with the strongest association being for the inner layer. We further observed that one-year lagged involvement in the inner and intermediary layers led to significantly lower K6 scores. However, the protective influences of social networks generally diminished over time. In addition, the protective influences of social network involvement on psychological distress were stronger for women than for men. Furthermore, involvement in social networks was especially important for improving mental health among people with psychological distress. These findings would be important for policymaking to prevent mental health deterioration among middle-aged adults in Japan.

1. Introduction

The prevalence of mental disorders has drastically increased during the last decade. Indeed, from 1999 to 2011, the total number of Japanese with mental illness ascended by approximately 1.2 million (from 2.04 to 3.20 million, respectively). Of these individuals, 47.8% were adults aged 35—64 (Ministry of Health, Labour and Welfare, 2016). Worse still, Japan's social attitudes toward mental disorders have been generally unfavorable. According to Ando et al. (2013), only 5% of Japanese believe that mentally ill people can recover from their illness, and 61% of employers claimed that they would never employ someone with a mental illness. Under these circumstances, mental disorders have increasingly become one of the major causes of suicide, which was the second leading cause of death among middle-aged adults in 2012 in Japan (Cabinet Office, 2014). Hence, it is of great interest to determine what factors would be helpful for preventing the deterioration of

psychological distress among middle-aged adults in Japan.

Western psychologists have clarified several mechanisms for a negative correlation between social networks involvement and psychological distress (Santini et al., 2015). Regarding to people whose mental health being improved, two models—the main effects model and the stress-buffering model—were constructed (Cohen and Wills, 1985; Cohen, 2004; Kawachi and Berkman, 2001). The main effects model posited that involving in social networks would directly improve mental health irrespective of whether people were under distress (Berkman and Glass, 2000). In contrast, the stress-buffering model assumes that involving in social network mitigates distress via modulation of responses to stressful events (Dean and Lin, 1977; Jimmieson et al., 2010; Thoits, 1982). Accordingly, the main effects model reflects a structural aspect of the support from social network, and the stress-buffering model emphasizes on a functional aspect. Meanwhile, psychologists also conceptualized the support from social network in terms of its content and subjectivity (House and Kahn, 1985). Regarding the content, the support was divided to be emotional (e.g., expressions of empathy), instrumental (e.g., tangible aid), and informational (e.g., advice). Regarding the subjectivity, it was characterized to be perceived and received (Wethington and Kessler, 1986). These concepts were not exclusive. For instance, the perceived (received) support from social network was applicable to both the main effect and stress-buffering models, and to each of the content.

While various concepts were established, most empirical studies focused on the subjectivity of support from social network, and explored particularly how perceived support from network involvement reduces physiological distress (Song et al., 2011). Among others, Lin et al. (1999) attempted to incorporate and examine all the above-mentioned concepts. They first distinguished explicitly the structural and functional aspects of the support from social network; then incorporated the perceived and received support, as well as instrumental and emotional support into the functional aspect. Furthermore, they refined the structural aspect by stratifying location of a social network into three layers: outer (e.g., participation in community organizations), intermediary (e.g., connections to colleagues in the workplace), and inner (intimate relations, e.g., friendship ties). Per this framework, each outer layer affords individuals opportunities to build up each inner layer, which leads to a strengthening of the salutary effects of these inner layers on mental health. Lin and colleagues hypothesized that the structural aspect of social network involvement—the three layers—constituted environment in which the functional aspect would be constructed and sustained, and the most inner layer would relate to the strongest functional effect to reduce physiological distress. Their corresponding empirical analyses provided affirmative results.

Asian psychologists also found evidences on the negative correlation between social network involvement and distress (Kim et al., 2008; Liu et al., 1995). Among the literature, Japanese scholars showed that involving in leisure activities was correlated with reduced depressive symptoms among Japanese workers (Wada et al., 2007), and that lack of social activities was correlated with increased depressive symptoms among middle-aged Japanese (Oshio, 2014). Besides, a cross-cultural comparative study by Fiori et al. (2008) revealed that there is no difference in psychological distress between Japanese who were involved in an expansive set of networks and those who were not, but that significant differences do exist for their counterparts in the United States.

Despite these theoretical postulations on how social networks are crucial for improving mental health, this relationship has yet to be confirmed as *causal*. Furthermore, no research in Japan has illustrated how the structural layers of social networks proposed by Lin et al. (1999) protect against psychological distress. A different culture in Japan to that in Western countries makes effect of the three layers, in patricidal that of the outer layer, be ambiguous. In Japan's cultural context, following rules and norms, as well as maintaining group harmony, are more important than satisfying an individual's needs (Taylor et al., 2004). Hence, involving in the outer layer of social network in Japan may not reduce the psychological distress. In fact, the opposite may be the case, and evidences are necessary for the corresponding judgment.

Accordingly, we sought to build on current literature in several respects. First, focusing on the structural aspect of social network, we examine the positive associations between social networks involvement and mental health among middle-aged adults in Japan. Specifically, we stratify social network into the three layers (i.e., outer, intermediary, and inner) to examine its structural effects. Second, we investigate the causal relations between involvement in social networks and mental health by incorporating a one-year lagged value of involvement in each layer as an explanatory variable. Third, we trace the changes in these causal influences over time by further including two-year lagged values of social network involvement. Finally, we verified the applicability of the main effect and stress-buffering models to people in Japan.

2. Methods

2.1. Design and participants

We used longitudinal data over nine consecutive years obtained from a nationally representative survey called "The Longitudinal Survey of Middle-aged and Older Persons" (LSMEP) in Japan, which has been conducted annually since 2005 b y the Ministry of Health, Labour and Welfare (MHLW). The samples for this survey were randomly selected through a two-stage sampling procedure. Specifically, 2515 districts at baseline (i.e., in 2005) were randomly selected from all 5280 districts covered by another nationally representative repeated cross-sectional survey (called the "Comprehensive Survey of Living Conditions") in 2004. Then, 40,877 respondents were selected randomly from among those aged 50–59 in each selected district in a way that was proportional to the size of the district and the distributions of sex and age in the population.

The self-administered questionnaires were delivered to the 40,877 respondents by enumerators in November 2005; the enumerators successfully retrieved the questionnaires several days later from 34,240 respondents (response rate: 83.8%). For each subsequent year (i.e., from the second year onward), the questionnaires were mailed only to respondents who had responded to the survey within the previous one or two year. No new respondents have been recruited since 2005; the response rate of the latest year—2013—has declined to 58.0% of the total at baseline.

We concentrated on respondents continuously responding to the survey. This ultimately left us with a sample of 15,242 respondents (valid response rate: 44.87%) from year 2005–2013, 7433 of which were men and 7809 women.

2.2. Measurements

2.2.1. Psychological distress

The Kessler 6 (K6) was used to assess psychological distress over each year of the LSMEP (Kessler et al., 2010). This measure comprises six items: "During the past one month (30 days), how much of the time did you feel (1) nervous, (2) hopeless, (3) restless or fidgety, (4) so sad that nothing could cheer you up, (5) that everything was an effort, and (6) worthless?" Response choices ranged from "none of the time" (yielding a score of 0) to "all of the