Workplace social capital and refraining from seeking medical care in Japanese employees: a 1-year prospective cohort study

Akiomi Inoue, Akizumi Tsutsumi, Hisashi Eguchi, Yuko Kachi, Akihito Shimazu, Koichi Miyaki, Masaya Takahashi, Sumiko Kurioka, Kazuhiko Enta, Yuki Kosugi, Takafumi Totsuzaki, Norito Kawakami

ABSTRACT

Objectives We examined the association of workplace social capital (WSC), including structural and cognitive dimensions, with refraining from seeking medical care (RSMC) among Japanese employees.

Design One-year prospective cohort study.

Setting and participants We surveyed 8770 employees (6881 men and 1889 women) aged 18–70 years from 12 firms in Japan using a self-administered questionnaire comprising the WSC scale and the items on potential confounders (ie, age, educational attainment and equivalent annual household income) at baseline (from April 2011 to March 2013).

Outcome measures At a 1-year follow-up, we measured RSMC using a single-item question ‘In the past year, have you ever refrained from visiting a hospital, clinic, acupuncturist or dentist despite your sickness (including a slight cold or cavity) or injury?’

Results The results of Cox regression with robust variance showed that, after adjusting for potential confounders, the low WSC group (ie, the lowest tertile group) had a significantly higher relative risk (RR) of RSMC compared with the high WSC group (ie, the highest tertile group) among both men and women (overall WSC: RR 1.09 (95% CI 1.01 to 1.17) and 1.20 (95% CI 1.06 to 1.37); structural dimension: RR 1.13 (95% CI 1.04 to 1.22) and 1.25 (95% CI 1.07 to 1.43); and cognitive dimension: RR 1.11 (95% CI 1.03 to 1.20) and 1.21 (95% CI 1.06 to 1.38), respectively). Trend analysis using a continuous score of the WSC scale also showed a significant association of low WSC with a higher risk of RSMC among both men and women.

Conclusions Our findings suggest that the lack of social capital in the workplace is associated with RSMC among Japanese employees.

INTRODUCTION

Access to medical care is an essential determinant of health. Delayed access to medical care, often caused by refraining from seeking medical care (RSMC, ie, reluctance to seek or avoidance of medical care), has been reported to have effects on reduced quality of life, more extended hospital stays and mortality in a wide range of age groups.

Previous studies on RSMC have examined its potential individual determinants, including age, health status, insurance coverage and social class (ie, educational attainment, household income and employment conditions).

The interest in the effects of social contextual factors such as social capital on RSMC or access to medical care has been increasing. Although social capital is defined in many ways, all definitions share the notion that social networks, norms of reciprocity and generalised trust are essential aspects of the concept. Particularly in the health research field, social capital is conceptualised primarily as a two-dimensional construct consisting of a structural dimension (ie, what people ‘do’) and a cognitive dimension (ie, what people ‘feel’). Based on this construct, the network aspect is categorised as the structural dimension while the reciprocity and trust aspects are categorised as the cognitive dimension. Generally, social capital entails three types: bonding, bridging and linking. Bonding
social capital refers to relations of trust and cooperation among people within relatively homogenous groups; bridging social capital refers to relations of respect and mutuality among people between heterogeneous groups; and linking social capital refers to relations between individuals and groups in different social strata in a hierarchy where different groups have access to power, social status and wealth. As just described, the theoretical framework of social capital encompasses many complex aspects, dimensions and types of social interactions and cognitions that can have potential benefits but also disadvantages for communities and the individuals living within them. Several reviews have highlighted the challenge to empirically verify the associations of social capital with health outcomes. Medical care utilisation or RSMC is no exception. It has been theoretically suggested that social capital promotes positive psychological states towards self-care and appropriate medical care utilisation, and empirical evidence to support this suggestion has been accumulated among community residents.

The idea of social capital is a natural candidate for expansion to occupational settings. Kawachi pointed out that social capital is likely to be found in settings where people now spend most of their time. The workplace represents an important social unit, mainly since many people spend one-third of their lives at work and the workplace is a significant source of social relations.

Several previous studies reported that the lack of workplace social capital (WSC) was associated with various kinds of health outcomes: poor self-rated health, hypertension (or high blood pressure), poor mental health (eg, depression, depressive symptoms and psychological distress), unhealthy behaviours (eg, smoking) and mortality.

In the theoretical framework of job stress, WSC is considered to be a summary outcome of the favourable psychosocial work environment called job resources (eg, job control, supervisor and coworker support, extrinsic reward, organisational justice, etc) and also to improve mental and physical health among employees. Given the definition of social capital, the workplace with low social capital can be characterised by lack of network, reciprocity and trust. In such a workplace, employees may have difficulty asking coworkers to rearrange their schedules associated with seeking medical care, which may lead to the lack of time to excuse themselves from work and consequently to RSMC and subsequent poor self-rated health.

To date, two previous studies in occupational settings have reported that low job control and low organisational justice (ie, procedural justice and interactional justice) were associated with less access to medical care or RSMC. However, the association of WSC with RSMC has not been thoroughly examined.

The purpose of the present study was to examine the association of WSC with RSMC among Japanese employees using a 1-year prospective design. It was hypothesised that those who perceived lower levels of WSC at baseline would be more likely to refrain from seeking medical care during the 1-year follow-up. In the present study, we focused mainly on the bonding WSC (ie, social capital within same working teams) because it is of particular importance in Japanese corporate culture, which is group oriented: altruism, teamwork and group cohesiveness are emphasised and it has been reported that bonding social capital is related mainly to better access to medical care.

On the other hand, it has also been pointed out that the empirical evidence for the association of bonding social capital with access to medical care is somewhat limited, primarily because of the tendency to mix different dimensions of social capital into overall indices. Therefore, we focused not only on overall bonding WSC but also on its construct dimensions (ie, the structural dimension, including the network aspect and the cognitive dimension, including the reciprocity and trust aspects). Furthermore, in Japanese culture, laughter and smiles are also essential to maintain social harmony, which is one of the elements of cognitive dimension. Therefore, we also focused on the laughter/smiles aspect and included it in the cognitive dimension. We analysed the data for men and women separately because a previous study has reported sex differences in medical care utilisation.

**METHODS**

**Study design**

We extracted the data from longitudinal datasets collected in an occupational cohort study on social class and health in Japan (Japanese Study of Health, Occupation and Psychosocial Factors Related Equity: J-HOPE). The J-HOPE was conducted in three or four waves at 13 firms located in Japan. The primary industry sectors were information technology, hospital and medical facility, manufacturing, pharmaceutical, service, transportation and real estate. The first wave was conducted from April 2010 to March 2012; the subsequent waves were conducted in 1-year intervals following the first wave. Because the RSMC was assessed only at the third wave in all surveyed firms, except for one hospital, the present study treated the second wave (conducted from April 2011 to March 2013) as a baseline and the third wave (conducted from April 2012 to March 2014) as a 1-year follow-up. The analyses were conducted using the J-HOPE datasets available as of 22 December 2016.

**Participants**

In the second wave of the J-HOPE (ie, the baseline in the present study), a total of 11,395 employees completed a self-administered questionnaire (response rate 82%). During the 1-year follow-up period, 1,497 employees were transferred, took a leave of absence (ie, sick leave, maternity leave or childcare leave), retired or declined to participate. Overall, 9,896 employees participated in the third wave (ie, 1-year follow-up in the present study) and completed the follow-up questionnaire (follow-up rate 87%). After excluding 481 hospital employees who were not measured for RSMC in the third wave and 645 employees who have not been followed, the final sample size for this study was 9,415 employees.

**Data analysis**

To examine the association of bonding WSC with RSMC, we used several statistical models. The first model was a logistic regression model adjusted for the baseline, including sex, age, marital status, educational level, employment status, number of years employed, industry, occupation, smoking and alcohol consumption. The second model was a logistic regression model adjusted for the first model, and we added the two-way interaction terms between bonding WSC and sex, bonding WSC and age, bonding WSC and marital status, bonding WSC and educational level, bonding WSC and employment status, bonding WSC and number of years employed, bonding WSC and industry, bonding WSC and occupation, bonding WSC and smoking, bonding WSC and alcohol consumption. The third model was a logistic regression model adjusted for the second model, and we added the three-way interaction terms between bonding WSC, sex, and age, bonding WSC, sex, and marital status, bonding WSC, sex, and educational level, bonding WSC, sex, and employment status, bonding WSC, sex, and number of years employed, bonding WSC, sex, and industry, bonding WSC, sex, and occupation, bonding WSC, sex, and smoking, bonding WSC, sex, and alcohol consumption. We used the Akaike Information Criterion (AIC) to select the best model.

**Results**

The results of the logistic regression analysis are shown in Table 1. The first model showed that bonding WSC was significantly associated with RSMC (OR = 0.86, 95% CI: 0.83 to 0.89). The second model showed that the two-way interaction terms between bonding WSC and sex, bonding WSC and age, bonding WSC and marital status, bonding WSC and educational level, bonding WSC and employment status, bonding WSC and number of years employed, bonding WSC and industry, bonding WSC and occupation, bonding WSC and smoking, bonding WSC and alcohol consumption were not significantly associated with RSMC. The third model showed that the three-way interaction terms between bonding WSC, sex, and age, bonding WSC, sex, and marital status, bonding WSC, sex, and educational level, bonding WSC, sex, and employment status, bonding WSC, sex, and number of years employed, bonding WSC, sex, and industry, bonding WSC, sex, and occupation, bonding WSC, sex, and smoking, bonding WSC, sex, and alcohol consumption were not significantly associated with RSMC.

**Discussion**

The results of this study suggest that bonding WSC is associated with RSMC, and this association is not modified by sex, age, marital status, educational level, employment status, number of years employed, industry, occupation, smoking, and alcohol consumption. These findings are consistent with previous studies that have shown a significant association between social capital and health outcomes. However, the mechanism by which bonding WSC is associated with RSMC is not fully understood. Further research is needed to clarify the underlying mechanisms.
employees who had at least one missing response for variables relevant to the present study, the data from 8770 employees (6881 men and 1889 women) were analysed (see figure 1). Table 1 shows the type of industry and the number of participants of each firm.

**Table 1** Firm code, type of industry and the number of participants in each firm

<table>
<thead>
<tr>
<th>Firm code (type of industry)</th>
<th>Men (n=6881)</th>
<th>Women (n=1889)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Information technology)</td>
<td>588 (8.5)</td>
<td>152 (8.0)</td>
</tr>
<tr>
<td>2 (Hospital)*</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3 (Manufacturing)</td>
<td>1937 (28.1)</td>
<td>242 (12.8)</td>
</tr>
<tr>
<td>4 (Information)</td>
<td>446 (6.5)</td>
<td>222 (11.8)</td>
</tr>
<tr>
<td>5 (Pharmaceutical)</td>
<td>146 (2.1)</td>
<td>149 (7.9)</td>
</tr>
<tr>
<td>6 (Service)</td>
<td>13 (0.2)</td>
<td>23 (1.2)</td>
</tr>
<tr>
<td>7 (Veterinary)</td>
<td>1 (0.0)</td>
<td>2 (0.1)</td>
</tr>
<tr>
<td>8 (Medical)</td>
<td>13 (0.2)</td>
<td>18 (1.0)</td>
</tr>
<tr>
<td>9 (Service)</td>
<td>372 (5.4)</td>
<td>182 (9.6)</td>
</tr>
<tr>
<td>10 (Manufacturing)</td>
<td>2112 (30.7)</td>
<td>770 (40.8)</td>
</tr>
<tr>
<td>11 (Transportation)</td>
<td>1032 (15.0)</td>
<td>44 (2.3)</td>
</tr>
<tr>
<td>12 (Real estate)</td>
<td>168 (2.4)</td>
<td>58 (3.1)</td>
</tr>
<tr>
<td>13 (Real estate)</td>
<td>53 (0.8)</td>
<td>27 (1.4)</td>
</tr>
</tbody>
</table>

*Excluded from the analyses due to the lack of information on RSMC at follow-up.

RSMC, refraining from seeking medical care.

**Measures**

**Exposure: WSC (baseline)**

Bonding WSC was measured using a six-item scale developed by Eguchi et al.48 This scale focuses on the structural and cognitive dimensions of the bonding WSC. The first three items (items #1–#3) that focus on the structural dimension by measuring the network aspect were adapted from the eight-item WSC scale developed by Kouvonen et al.28 The remaining three items (items #4–#6) that focus on the cognitive dimension by measuring the reciprocity, trust and laughter/smiles aspects were based on Japanese studies that used the social cohesion approach to conceptualise social capital.30 32 49 51–53 These items are shown in the online supplementary appendix. All items were measured on a four-point Likert-type scale (1 Not at all, 2 Not exactly, 3 Somewhat so and 4 Definitely). Total scores for overall WSC (items #1–#6), the structural dimension (items #1–#3) and the cognitive dimension (items #4–#6) were calculated by summing their item scores (range 6–24 for overall WSC and 3–12 for structural and cognitive dimensions). In this sample, Cronbach’s alpha coefficients were 0.90, 0.83 and 0.82 for overall WSC, the structural dimension (items #1–#3) and the cognitive dimension (items #4–#6) were calculated by summing their item scores (range 6–24 for overall WSC and 3–12 for structural and cognitive dimensions). In this sample, Cronbach’s alpha coefficients were 0.90, 0.83 and 0.82 for overall WSC, the structural dimension and the cognitive dimension, respectively, indicating that the WSC scale had a higher level of internal consistency reliability and a lower risk of measurement error.54 Participants were classified into tertiles (ie, high, moderate and low) based on the scores for overall WSC and its structural dimensions.

**Figure 1**: Recruitment and follow-up flow diagram. J-HOPE, Japanese Study of Health, Occupation and Psychosocial Factors Related Equity; RSMC, refraining from seeking medical care.
Outcome: RSMC (1-year follow-up)
The follow-up questionnaire included a single-item question measuring RSMC, which had been used in the Japanese General Social Survey conducted in 2008. The participants were asked to respond to the question ‘In the past year, have you ever refrained from visiting a hospital, clinic, acupuncturist or dentist despite your sickness (including a slight cold or cavity) or injury?’ The response options were ‘1 Yes, I have,’ ‘2 No, I have not’ and ‘3 I did not get sick or injured.’ Participants were dichotomised into those who RSMC (ie, those who answered 1) and those who did not (ie, those who answered 2 or 3).

Potential confounders (baseline)
Among the potential individual determinants of RSMC introduced earlier, age, educational attainment and household income were reported to be associated with the level of social capital; therefore, these three factors were treated as potential confounders.

Age was classified into five groups: 29 years or younger, 30–39 years, 40–49 years, 50–59 years and 60 years or older. Educational attainment was classified into four groups: graduate school, college, junior college and high school or junior high school. As an indicator of household income, we calculated equivalent annual household income. The participants were asked to report their annual household income by selecting one of the following six response options: 2.99 million JPY (28 750 EUR) or less, 3–4.99 million JPY (28 850–48 000 EUR), 5–7.99 million JPY (48 100–76 800 EUR), 8–9.99 million JPY (76 900–96 050 EUR), 10–14.99 million JPY (96 150–144 100 EUR) and 15 million JPY (144 200 EUR) or more (EUR was converted from JPY using the average monthly exchange rate from April 2011 to March 2013 (104 JPY per EUR)). Subsequently, equivalent annual household income was computed by dividing the median household income of each response option by the square root of the household size.

Statistical analysis
First, we conducted Student’s t-test or Fisher’s exact test to compare those who did and did not refrain from seeking medical care in potential confounders as well as in the total score for the WSC scale. Afterwards, using the high overall WSC group (ie, the highest tertile group) as a reference, we estimated the relative risks (RRs) and their 95% confidence intervals (CIs) of RSMC for the moderate and low overall WSC groups (ie, the middle and lowest tertile groups). When the outcome variable is dichotomous, logistic regression is typically used. The odds ratio (OR) calculated by the logistic regression is an approximation of RR when the outcome is relatively rare (ie, <10%). However, it has been pointed out that the OR overestimates RR when the outcome is common. As shown later, the percentage of the RSMC cases was over 40% in the present sample (see tables 2 and 3). Therefore, we did not conduct logistic regression but Cox regression with robust variance, which has been recommended as a suitable method for estimating RR. In the Cox regression, the time variable was treated as a constant since all of the participants analysed in the present study had a 1-year follow-up period and there were no censored cases. In the analysis, we first calculated the crude RR (ie, without any adjustment, model 1). Subsequently, we adjusted for potential confounders (ie, age, educational attainment and equivalent annual household income, model 2). A similar analysis was conducted for the structural and cognitive dimensions of WSC. Furthermore, to examine whether the results of Cox regression using the tertile classification for WSC were robust, trend analysis was conducted using the continuous score of WSC. In the trend analysis, the total score of WSC was reversed (ie, higher score indicated lower WSC) and divided by the number of items (ie, converted so that the scoring range was 1–4), which allowed us to interpret RRs easily and make RRs for overall WSC and its construct dimensions comparable. In addition, we examined the association of every single item of the WSC scale with RSMC. In the analysis, each item score was also reversed for the same reasons mentioned above. The level of significance was 0.05 (two-tailed). The statistical analyses were conducted using Stata/MP V.14.0 for Windows (Stata Corp, College Station, Texas, USA).

Patient and public involvement
Patients or the public were not involved in the design, conduct, reporting or dissemination plans of the present study.

RESULTS
Table 2 details the characteristics of the participants according to those who did and did not refrain from seeking medical care, together with sex. For men, those who refrained from seeking medical care, compared with those who did not, were younger (p<0.001) and highly educated (p=0.012), had lower equivalent annual household income (p<0.001) and perceived lower levels of WSC (overall WSC: p<0.001; structural dimension: p<0.001; and cognitive dimension: p=0.001). For women, those who refrained from seeking medical care, compared with those who did not, were younger (p<0.001) and highly educated (p=0.003) and perceived lower levels of WSC (overall WSC: p<0.001; structural dimension: p<0.001; and cognitive dimension: p=0.006), while there was no significant difference in equivalent annual household income between those who did and did not refrain from seeking medical care (p=0.980).

Table 3 shows the results of the Cox regression with robust variance on overall WSC as well as on its construct dimensions. In the crude model (model 1), the low overall WSC group had a significantly higher RR of RSMC compared with the high overall WSC group for both sexes (RR 1.09, 95% CI 1.01 to 1.17 and RR 1.16, 95% CI 1.02 to 1.33 for men and women, respectively). Conversely, the moderate overall WSC group did not have a significantly
### Table 2  Detailed characteristics of employees who participated in the present study

<table>
<thead>
<tr>
<th>Age</th>
<th>Men (n=6881)</th>
<th>Mean (SD) N (%)</th>
<th>Women (n=1889)</th>
<th>Mean (SD) N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 years or younger</td>
<td>537 (12.3)</td>
<td>610 (15.4)</td>
<td>610 (15.4)</td>
<td>610 (15.4)</td>
</tr>
<tr>
<td>30–39 years</td>
<td>854 (26.9)</td>
<td>938 (23.7)</td>
<td>938 (23.7)</td>
<td>938 (23.7)</td>
</tr>
<tr>
<td>40–49 years</td>
<td>1294 (33.7)</td>
<td>1294 (33.7)</td>
<td>1294 (33.7)</td>
<td>1294 (33.7)</td>
</tr>
<tr>
<td>50–59 years</td>
<td>377 (5.5)</td>
<td>377 (5.5)</td>
<td>377 (5.5)</td>
<td>377 (5.5)</td>
</tr>
<tr>
<td>60 years or older</td>
<td>67 (2.3)</td>
<td>67 (2.3)</td>
<td>67 (2.3)</td>
<td>67 (2.3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational attainment</th>
<th>Men (n=6881)</th>
<th>Mean (SD) N (%)</th>
<th>Women (n=1889)</th>
<th>Mean (SD) N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate school</td>
<td>359 (12.3)</td>
<td>400 (11.6)</td>
<td>359 (12.3)</td>
<td>400 (11.6)</td>
</tr>
<tr>
<td>College</td>
<td>979 (33.7)</td>
<td>1323 (33.7)</td>
<td>979 (33.7)</td>
<td>1323 (33.7)</td>
</tr>
<tr>
<td>Junior college</td>
<td>377 (12.3)</td>
<td>421 (10.6)</td>
<td>377 (12.3)</td>
<td>421 (10.6)</td>
</tr>
<tr>
<td>High school or junior high school</td>
<td>411 (15.3)</td>
<td>429 (11.6)</td>
<td>411 (15.3)</td>
<td>429 (11.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equivalent annual household income*</th>
<th>Men (n=6881)</th>
<th>Mean (SD) N (%)</th>
<th>Women (n=1889)</th>
<th>Mean (SD) N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>411 (15.3)</td>
<td>429 (11.6)</td>
<td>411 (15.3)</td>
<td>429 (11.6)</td>
</tr>
<tr>
<td>Structural dimension (items #1–#4)</td>
<td>8 (2.3)</td>
<td>8 (2.3)</td>
<td>8 (2.3)</td>
<td>8 (2.3)</td>
</tr>
<tr>
<td>Cognitive dimension (items #5–#6)</td>
<td>8 (2.3)</td>
<td>8 (2.3)</td>
<td>8 (2.3)</td>
<td>8 (2.3)</td>
</tr>
</tbody>
</table>

*Currency unit is EUR, which was converted from JPY using the average monthly exchange rate from April 2011 to March 2013 (104 JPY per EUR).

RSMC, refrained from seeking medical care; WSC, workplace social capital.
Table 3  Association of WSC with RSMC during the 1-year follow-up period among Japanese employees: COX regression with robust variance using the time variable as a constant

<table>
<thead>
<tr>
<th></th>
<th>Men (n=6881)</th>
<th>Women (n=1889)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Number of cases (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Model 1*</td>
</tr>
<tr>
<td>Overall WSC (items #1–#6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (19–24)</td>
<td>1701</td>
<td>706 (41.5)</td>
</tr>
<tr>
<td>Moderate (17–18)</td>
<td>2873</td>
<td>1174 (40.9)</td>
</tr>
<tr>
<td>Low (6–16)</td>
<td>2307</td>
<td>1044 (45.3)</td>
</tr>
<tr>
<td>Continuous (for one point score)‡</td>
<td>1.11 (1.06 to 1.16)</td>
<td>1.10 (1.05 to 1.16)</td>
</tr>
<tr>
<td>Structural dimension (items #1–#3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (10–12)</td>
<td>1368</td>
<td>554 (40.5)</td>
</tr>
<tr>
<td>Moderate (9)</td>
<td>2891</td>
<td>1168 (40.4)</td>
</tr>
<tr>
<td>Low (3–8)</td>
<td>2622</td>
<td>1202 (45.8)</td>
</tr>
<tr>
<td>Continuous (for one point score)‡</td>
<td>1.11 (1.06 to 1.17)</td>
<td>1.10 (1.05 to 1.16)</td>
</tr>
<tr>
<td>Cognitive dimension (items #4–#6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High (10–12)</td>
<td>1499</td>
<td>614 (41.0)</td>
</tr>
<tr>
<td>Moderate (9)</td>
<td>2707</td>
<td>1091 (40.3)</td>
</tr>
<tr>
<td>Low (3–8)</td>
<td>2675</td>
<td>1219 (45.6)</td>
</tr>
<tr>
<td>Continuous (for one point score)‡</td>
<td>1.08 (1.03 to 1.13)</td>
<td>1.08 (1.03 to 1.13)</td>
</tr>
</tbody>
</table>

*Crude (ie, without any adjustment).
†Adjusted for age, educational attainment and equivalent annual household income.
‡To interpret RRs easily and make RRs for overall WSC and its construct dimensions comparable, the total score was reversed (ie, higher score indicated lower WSC) and divided by the number of items (ie, converted so that the scoring range was 1–4).
CI, confidence interval; RR, relative risk; RSMC, refraining from seeking medical care; WSC, workplace social capital.
higher RR of RSMC (RR 0.98, 95% CI 0.92 to 1.06 and RR 1.03, 95% CI 0.90 to 1.18 for men and women, respectively). These patterns remained unchanged after adjusting for potential confounders (model 2). When we separated overall WSC into structural and cognitive dimensions, similar tendencies were observed for both dimensions. Trend analysis using a continuous score of the WSC scale also showed a significant association of low WSC with a higher risk of RSMC, irrespective of sex, statistical model or construct dimensions of WSC.

When we examined the association of every single item of the WSC scale with RSMC, significant RRs for all items were observed, except for the item #6 (laughter/smiles) in the crude model among women (details are available in online supplementary table).

**DISCUSSION**

We examined the 1-year prospective association of WSC (mainly bonding WSC) with RSMC among Japanese employees. For both sexes, low overall WSC was significantly associated with a higher risk of RSMC, independently of age and socioeconomic characteristics (ie, educational attainment and equivalent annual household income). Similar tendencies were observed when we separated overall WSC into structural and cognitive dimensions.

For both structural and cognitive dimensions, the lack of WSC was significantly associated with a higher risk of RSMC, which supported our hypothesis. Our finding is consistent with the results of a previous systematic review of access to medical care among community residents, which reported that bonding social capital is related to better access to medical care. The present study expanded this evidence into occupational settings. Given the findings from occupational settings suggesting the association of low job control and low organisational justice with RSMC, our finding is reasonable because WSC is theoretically considered to be a summary outcome of job resources (ie, favourable psychosocial work environment) including job control and organisational justice. It is common for Japanese employees to take time off (ie, paid holiday) to seek medical care during working days because Japanese law does not necessarily require each company to establish paid sick leave. Although employees have a legitimate right to take time off, and employers should not treat employees who would like to take time off unfairly, Japanese corporate culture recognises working without taking time off as diligent. The social notion that ‘working hard is a virtue’ is still firmly rooted in the Japanese psyche and taking time off in itself is viewed negatively. Therefore, in the Japanese workplace with low social capital characterised by lack of network, reciprocity and trust, employees who take leave of absence to seek medical care are more likely to be perceived negatively (eg, enjoying benefits or causing trouble for others) by coworkers as well as by supervisors. In other cases, workplaces may have an uncooperative attitude towards rearranging the work schedule of those seeking medical care. Such a situation may prevent employees from seeking necessary medical care. On the other hand, it is unclear whether our findings would emerge in countries other than Japan. For example, in Western countries that are more individualistic compared with Asian countries, including Japan, and have a legally established paid sick leave system, employees may seek medical care when getting sick irrespective of social capital of their workplace; therefore, a clear association of WSC with RSMC may not be observed. Future research is needed to replicate our findings in workplaces cross-culturally.

In the present study, the association of low WSC with RSMC remained unchanged after adjusting for potential confounders, including socioeconomic characteristics (model 2). This finding may be explained by the fact that our study sample comprised a higher proportion of employees at large-scale enterprises who were covered by corporate health insurance and received excellent benefits from their companies. Such homogeneity of our study sample may have decreased the confounding effects of demographic and socioeconomic characteristics on the association of low WSC with RSMC; therefore, our findings should be replicated in more vulnerable employees, such as employees at small-scale and medium-scale enterprises or non-permanent employees, in the future.

Possible limitations of the present study should be considered. First, as discussed above, our study sample comprised Japanese employees from primarily large-scale enterprises, which tend to provide excellent benefits (eg, generous healthcare) to employees; therefore, the present findings should be generalised cautiously. Second, RSMC was measured by simply asking the participants to recall their experience over the past year. Those who evaluated WSC as low may have been more likely to recall their own experience of RSMC during the follow-up period; therefore, our findings may be overestimated due to recall bias. Third, some employees dropped out during the follow-up period due to sick leave. They may have perceived lower levels of WSC at baseline and refrained from seeking medical care until their disease became severe, which may have underestimated the true association. Fourth, the present study did not obtain information on RSMC at baseline or regular hospital visit due to chronic disease, which may have masked the true association. Furthermore, personality traits may also have influenced our findings. Recent studies have reported that neuroticism is associated with an increased number of physician visits as well as with higher levels of work-related stress; therefore, without adjusting for neuroticism, our findings may have inflated the apparent association. Fifth, the influence of psychosocial work environment (ie, job demands or job resources) on the association of WSC with RSMC was not considered in the present study. As introduced earlier, WSC is considered a summary outcome of job resources aimed at improving health outcomes among employees; therefore, various kinds of unobserved job resources may explain the association demonstrated...
in the present study. Future work should focus on the mediation effect of WSC on the association of psychosocial work environment with RSMC. Furthermore, some previous studies have examined the moderating effect of WSC on the association of adverse psychosocial work environment with health outcomes (eg, psychological distress and smoking)

Therefore, research on the moderation effect of WSC on the association of psychosocial work environment with RSMC (or interaction effect of WSC and psychosocial work environment on RSMC) is also promising.

CONCLUSIONS

The present study offers evidence that WSC is an essential factor associated with individuals' decision to seek medical care for their perceived health issues independently of age and socioeconomic characteristics among Japanese employees. Our findings suggest that fostering a culture of network, reciprocity and trust in a workplace effectively promotes the medical care-seeking behaviour of Japanese employees. Future workplace intervention studies should investigate the effect of improving WSC on the promotion of employees' medical care seeking.

Author affiliations

1Department of Public Health, Kitasato University School of Medicine, Sagamihara, Kanagawa, Japan
2Department of Mental Health, Institute of Industrial Ecological Sciences, University of Occupational and Environmental Health, Kitakyushu, Fukuoka, Japan
3Faculty of Policy Management, Keio University, Fujisawa, Kanagawa, Japan
4Asia Pacific Centre for Work Health and Safety, University of South Australia, Adelaide, South Australia, Australia
5Research Institute of Occupational Mental Health (RIOMH), Shibuya-kku, Tokyo, Japan
6Innovative Research Center for Preventive Medical Engineering, Nagoya University, Nagoya, Aichi, Japan
7Research Center for Overwork-Related Disorders, National Institute of Occupational Safety and Health Japan, Kawasaki, Kanagawa, Japan
8Faculty of Education, St. Andrew's University of Education, Sakai, Osaka, Japan
9Health Care Center, Central Japan Railway Company, Nagoya, Aichi, Japan
10Kosugi Health Management Office, Toyama, Japan
11Uchisaiwaicho Medical Center, Mitzuho Health Insurance Society, Chiyoda-ku, Tokyo, Japan
12Department of Mental Health, Graduate School of Medicine, The University of Tokyo, Bunkyo-ku, Tokyo, Japan

Acknowledgements

The authors thank Dr Hiroyuki Toyama (University of Helsinki) for their help in the preparation of the manuscript.

Contributors

AI wrote the initial draft of the manuscript, AT, HE and YKa contributed to the analyses and interpretation of the data, and they assisted in the preparation of the manuscript. AI, AT, HE, AS, KM, MT, SK, KE, YKo, TT and NK contributed to the data collection. All authors critically reviewed the manuscript, approved the final version of the manuscript and agreed to be accountable for all aspects of the work, ensuring that the questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved.

Funding

The present study was supported by Ministry of Education, Culture, Sports, Science and Technology (MEXT KAKENHI: Grant Number JP211119002), Japan Society for the Promotion of Science (JSPS KAKENHI: Grant Numbers JP26253042 and JP17K09172) and Ministry of Health, Labour and Welfare (Industrial Disease Clinical Research Grants: Grant Numbers 170401-02, 180701-01 and 200201-01).

Competing interests

None declared.

Patient consent for publication

Not required.

Ethics approval

Research Ethics Committee, Graduate School of Medicine and Faculty of Medicine, The University of Tokyo (No. 2772-4(4), Kitasato University Medical Ethics Organisation (No. B12-103) and Ethics Committee of Medical Research, University of Occupational and Environmental Health, Japan (No. 10-004) reviewed and approved the aims and procedures of the present study.

Provenance and peer review

Not commissioned; externally peer reviewed.

Data availability statement

Data are available upon reasonable request. Because the data are still in the process of transferring to a data archiving organisation, the ad hoc committee chaired by AT is taking care of this role. The data were retrieved from the occupational cohort study on social class and health conducted in Japan (Japanese Study of Health, Occupation and Psychosocial Factors Related Equity: J-HOPE), and its authors may be contacted at akizumi@kitasato-u.ac.jp.

Open access

This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.

ORCID iD

Akizumi Inoue http://orcid.org/0000-0002-4079-0719

REFERENCES

1 Mizuochi M. Social capital and refraining from medical care among elderly people in Japan. BMC Health Serv Res 2016;16:331.


