


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

Akiomi Inoue ,¹ Akizumi Tsutsumi,¹ Hisashi Eguchi,^{1,2} Yuko Kachi,¹ Akihito Shimazu,^{3,4} Koichi Miyaki,^{5,6} Masaya Takahashi,⁷ Sumiko Kurioka,⁸ Kazuhiko Enta,⁹ Yuki Kosugi,¹⁰ Takafumi Totsuzaki,¹¹ Norito Kawakami¹²

To cite: Inoue A, Tsutsumi A, Eguchi H, *et al.* Workplace social capital and refraining from seeking medical care in Japanese employees: a 1-year prospective cohort study. *BMJ Open* 2020;**10**:e036910. doi:10.1136/bmjopen-2020-036910

► Prepublication history and additional material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2020-036910>).

Received 10 January 2020
Revised 15 June 2020
Accepted 15 June 2020



© Author(s) (or their employer(s)) 2020. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

For numbered affiliations see end of article.

Correspondence to

Dr Akiomi Inoue;
akiomi@med.kitasato-u.ac.jp

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 1.45); 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.¹ Delayed access to medical care, often caused by refraining from seeking medical care (RSMC, ie, reluctance to seek or avoidance of medical care),² has been reported to have effects on reduced quality

Strengths and limitations of this study

- This is the first study examining the association of social capital with refraining from seeking medical care in the occupational setting.
- We used a large-scale dataset from an occupational cohort survey.
- Our sample was recruited from primarily large-scale enterprises in Japan; therefore, the generalisation of our findings should be made with caution.
- Refraining from seeking medical care was measured by simply asking the participants to recall their experience over the past year, which may have led to recall bias.

of life, more extended hospital stays and mortality in a wide range of age groups.^{3–6} Previous studies on RSMC have examined its potential individual determinants, including age,⁷ health status,⁸ insurance coverage⁹ and social class (ie, educational attainment, household income and employment conditions).^{10–15}

The interest in the effects of social contextual factors such as social capital on RSMC or access to medical care has been increasing.¹ 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.¹⁶ 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’).¹⁷ 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.¹⁸ 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.¹⁹ 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.^{20–22} 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,²³ and empirical evidence to support this suggestion has been accumulated among community residents.^{1 20}

The idea of social capital is a natural candidate for expansion to occupational settings. Kawachi²⁴ 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 work²⁵ and the workplace is a significant source of social relations.²⁶ Several previous studies reported that the lack of workplace social capital (WSC) was associated with various kinds of health outcomes: poor self-rated health,^{26–30} hypertension (or high blood pressure),^{31 32} poor mental health (eg, depression, depressive symptoms and psychological distress),^{27 33–38} unhealthy behaviours (eg, smoking)^{39–42} and mortality.⁴³

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.⁴⁴ 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.⁴⁵ 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.^{46 47} 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 emphasised⁴⁸ and it has been reported that bonding social capital is related mainly to better access to medical care.²⁰ 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.²⁰ 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,⁴⁹ which is one of the elements of cognitive dimension.^{17 18} 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.⁵⁰

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 11 393 employees completed a self-administered questionnaire (response rate 82%). During the 1-year follow-up period, 1497 employees were transferred, took a leave of absence (ie, sick leave, maternity leave or childcare leave), retired or declined to participate. Overall, 9896 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

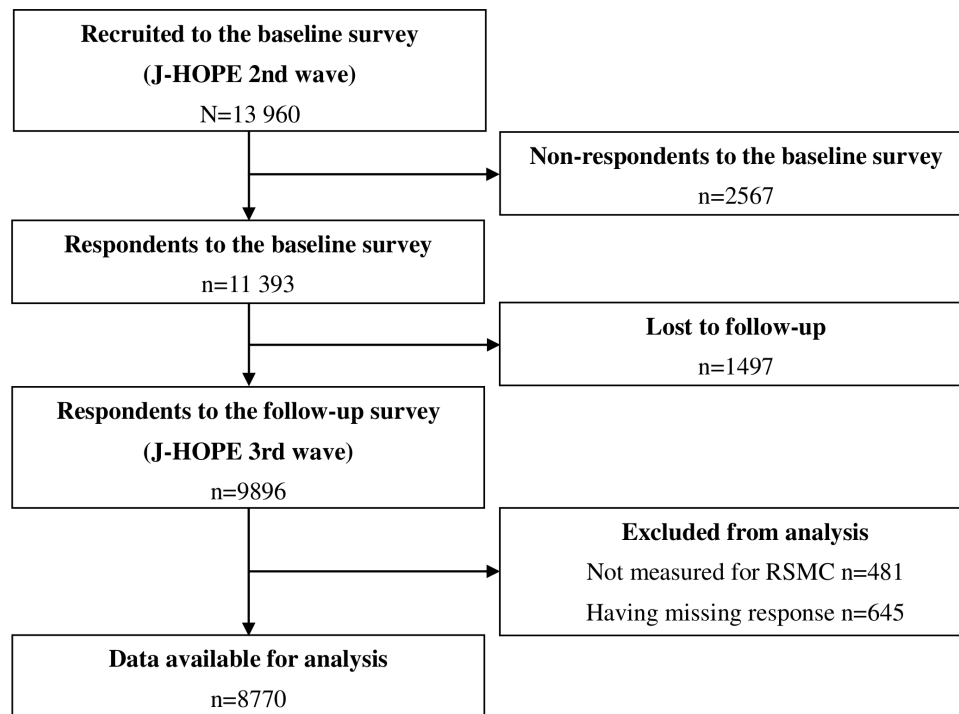


Figure 1 Recruitment and follow-up flow diagram. J-HOPE, Japanese Study of Health, Occupation and Psychosocial Factors Related Equity; RSMC, refraining from seeking medical care.

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

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

*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 42 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 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.

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 2008.¹³ 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,^{7–15} age, educational attainment and household income were reported to be associated with the level of social capital⁵⁵; 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.⁵⁶ 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.⁵⁷ 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

	Men (n=6881)						Women (n=1889)					
	RSMC (n=2924)			Did not refrain from seeking medical care (n=3957)			RSMC (n=870)			Did not refrain from seeking medical care (n=1019)		
	Mean (SD)	N (%)	N (%)	Mean (SD)	N (%)	N (%)	Mean (SD)	N (%)	N (%)	Mean (SD)	N (%)	N (%)
Age	40.5 (10.3)			42.2 (10.6)			38.1 (9.74)			40.8 (10.3)		
29 years or younger		537 (18.4)			610 (15.4)			222 (25.5)			187 (18.4)	
30–39 years		787 (26.9)			938 (23.7)			257 (29.5)			249 (24.4)	
40–49 years		996 (34.1)			1294 (32.7)			272 (31.3)			371 (36.4)	
50–59 years		537 (18.4)			975 (24.6)			111 (12.8)			188 (18.4)	
60 years or older		67 (2.3)			140 (3.5)			8 (0.9)			24 (2.4)	
Educational attainment												
Graduate school		359 (12.3)			460 (11.6)			39 (4.5)			31 (3.0)	
College		979 (33.5)			1332 (33.7)			234 (26.9)			214 (21.0)	
Junior college		377 (12.9)			421 (10.6)			220 (25.3)			266 (26.1)	
High school or junior high school		1209 (41.3)			1744 (44.1)			377 (43.3)			508 (49.9)	
Equivalent annual household income*	41 153 (18 297)			42 985 (19 161)			35 928 (21 180)			35 904 (21 565)		
WSC												
Overall WSC (items #1–#6) (range 6–24)	17.0 (3.32)			17.4 (3.31)			16.6 (3.55)			17.1 (3.45)		
Structural dimension (items #1–#3) (range 3–12)	8.50 (1.73)			8.68 (1.71)			8.20 (1.84)			8.51 (1.75)		
Cognitive dimension (items #4–#6) (range 3–12)	8.52 (1.77)			8.67 (1.76)			8.36 (1.88)			8.60 (1.86)		

*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

	Men (n=6881)			Women (n=1889)		
	N	Number of cases (%)	RR (95% CI)	N	Number of cases (%)	RR (95% CI)
Overall WSC (items #1–#6)						
High (19–24)	1701	706 (41.5)	1.00	439	188 (42.8)	1.00
Moderate (17–18)	2873	1174 (40.9)	0.98 (0.92 to 1.06)	731	324 (44.3)	1.03 (0.90 to 1.18)
Low (6–16)	2307	1044 (45.3)	1.09 (1.01 to 1.17)	719	358 (49.8)	1.16 (1.02 to 1.33)
Continuous (for one point score)‡			1.11 (1.06 to 1.16)			1.15 (1.06 to 1.25)
Structural dimension (items 1#–#3)						
High (10–12)	1368	554 (40.5)	1.00	305	126 (41.3)	1.00
Moderate (9)	2891	1168 (40.4)	1.00 (0.92 to 1.08)	768	331 (43.1)	1.04 (0.89 to 1.22)
Low (3–8)	2622	1202 (45.8)	1.13 (1.05 to 1.22)	816	413 (50.6)	1.23 (1.05 to 1.42)
Continuous (for one point score)‡			1.11 (1.06 to 1.17)			1.16 (1.08 to 1.26)
Cognitive dimension (items 4#–#6)						
High (10–12)	1499	614 (41.0)	1.00	410	177 (43.2)	1.00
Moderate (9)	2707	1091 (40.3)	0.98 (0.91 to 1.06)	694	302 (43.5)	1.01 (0.88 to 1.16)
Low (3–8)	2675	1219 (45.6)	1.11 (1.03 to 1.20)	785	391 (49.8)	1.15 (1.01 to 1.32)
Continuous (for one point score)‡			1.08 (1.03 to 1.13)			1.11 (1.03 to 1.20)

*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.²⁰ 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,^{46,47} 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.⁴⁴ 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.⁵⁸ 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,⁵⁹ 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 visits⁶⁰ as well as with higher levels of work-related stress⁶¹; 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 employees⁴⁴; 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)^{36 37 41}; 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-ku, 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, Mizuho 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 JP21119002), 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)), 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

Akiomi Inoue <http://orcid.org/0000-0002-4079-0719>

REFERENCES

- Mizuochi M. Social capital and refraining from medical care among elderly people in Japan. *BMC Health Serv Res* 2016;16:331.
- Taber JM, Leyva B, Persoskie A. Why do people avoid medical care? A qualitative study using national data. *J Gen Intern Med* 2015;30:290-7.
- Weissman JS, Stern R, Fielding SL, et al. Delayed access to health care: risk factors, reasons, and consequences. *Ann Intern Med* 1991;114:325-31.
- Prentice JC, Pizer SD. Delayed access to health care and mortality. *Health Serv Res* 2007;42:644-62.
- Rutherford ME, Dockerty JD, Jasseh M, et al. Access to health care and mortality of children under 5 years of age in the Gambia: a case-control study. *Bull World Health Organ* 2009;87:216-25.
- Chen J, Rizzo JA, Rodriguez HP. The health effects of cost-related treatment delays. *Am J Med Qual* 2011;26:261-71.
- Wong A, Wouterse B, Slobbe LCJ, et al. Medical innovation and age-specific trends in health care utilization: findings and implications. *Soc Sci Med* 2012;74:263-72.
- de Looper M, Lafortune G. *Measuring disparities in health status and in access and use of health care in OECD countries. OECD Health Working Papers, No. 43*. Paris: OECD Publishing, 2009.
- Sommers BD, Gawande AA, Baicker K. Health Insurance Coverage and Health - What the Recent Evidence Tells Us. *N Engl J Med* 2017;377:586-93.
- Gornick ME, Eggers PW, Reilly TW, et al. Effects of race and income on mortality and use of services among Medicare beneficiaries. *N Engl J Med* 1996;335:791-9.
- Braveman PA, Egerter SA, Cubbin C, et al. An approach to studying social disparities in health and health care. *Am J Public Health* 2004;94:2139-48.
- Westin M, Åhs A, Bränd Persson K, et al. A large proportion of Swedish citizens refrain from seeking medical care--lack of confidence in the medical services a plausible explanation? *Health Policy* 2004;68:333-44.
- Wamala S, Merlo J, Boström G, et al. Perceived discrimination, socioeconomic disadvantage and refraining from seeking medical treatment in Sweden. *J Epidemiol Community Health* 2007;61:409-15.
- Hanibuchi T. Inequalities in health and health care access: analysis of access to medical care using JGSS-2008. *JGSS Res Ser* 2010;7:99-110.
- Molarius A, Simonsson B, Lindén-Boström M, et al. Social inequalities in self-reported refraining from health care due to financial reasons in Sweden: health care on equal terms? *BMC Health Serv Res* 2014;14:605.
- Bhandari H, Yasunobu K. What is social capital? A comprehensive review of the concept. *Asian J Soc Sci* 2009;37:480-510.
- Harpham T, Grant E, Thomas E. Measuring social capital within health surveys: key issues. *Health Policy Plan* 2002;17:106-11.

- 18 Harpham T. The measurement of community social capital through surveys. In: Kawachi I, Subramanian SV, Kim D, eds. *Social capital and health*. New York: Springer, 2008: 51–62.
- 19 Szeiter S, Woolcock M. Health by association? social capital, social theory, and the political economy of public health. *Int J Epidemiol* 2004;33:650–67.
- 20 Derose KP, Varda DM. Social capital and health care access: a systematic review. *Med Care Res Rev* 2009;66:272–306.
- 21 Murayama H, Fujiwara Y, Kawachi I. Social capital and health: a review of prospective multilevel studies. *J Epidemiol* 2012;22:179–87.
- 22 Villalonga-Olives E, Kawachi I. The dark side of social capital: a systematic review of the negative health effects of social capital. *Soc Sci Med* 2017;194:105–27.
- 23 Kawachi I, Berkman LF, cohesion S. social capital, and health. In: Berkman LF, Kawachi I, eds. *Social epidemiology*. New York: Oxford University Press, 2000: 174–90.
- 24 Kawachi I. Social capital and community effects on population and individual health. *Ann N Y Acad Sci* 1999;896:120–30.
- 25 Burgard SA, Ailshire JA. Putting work to bed: stressful experiences on the job and sleep quality. *J Health Soc Behav* 2009;50:476–92.
- 26 Oksanen T, Kouvonen A, Kivimäki M, et al. Social capital at work as a predictor of employee health: multilevel evidence from work units in Finland. *Soc Sci Med* 2008;66:637–49.
- 27 Liukkonen V, Virtanen P, Kivimäki M, et al. Social capital in working life and the health of employees. *Soc Sci Med* 2004;59:2447–58.
- 28 Kouvonen A, Kivimäki M, Vahtera J, et al. Psychometric evaluation of a short measure of social capital at work. *BMC Public Health* 2006;6:251.
- 29 Suzuki E, Takao S, Subramanian SV, et al. Work-based social networks and health status among Japanese employees. *J Epidemiol Community Health* 2009;63:692–6.
- 30 Suzuki E, Takao S, Subramanian SV, et al. Does low workplace social capital have detrimental effect on workers' health? *Soc Sci Med* 2010;70:1367–72.
- 31 Oksanen T, Kawachi I, Jokela M, et al. Workplace social capital and risk of chronic and severe hypertension: a cohort study. *J Hypertens* 2012;30:1129–36.
- 32 Fujino Y, Kubo T, Kunimoto M, et al. A cross-sectional study of workplace social capital and blood pressure: a multilevel analysis at Japanese manufacturing companies. *BMJ Open* 2013;3:e002215.
- 33 Kouvonen A, Oksanen T, Vahtera J, et al. Low workplace social capital as a predictor of depression: the Finnish public sector study. *Am J Epidemiol* 2008;167:1143–51.
- 34 Oksanen T, Kouvonen A, Vahtera J, et al. Prospective study of workplace social capital and depression: are vertical and horizontal components equally important? *J Epidemiol Community Health* 2010;64:684–9.
- 35 Jung J, Ernstmann N, Nitzsche A, et al. Exploring the association between social capital and depressive symptoms: results of a survey in German information and communication technology companies. *J Occup Environ Med* 2012;54:23–30.
- 36 Oshio T, Inoue A, Tsutsumi A. The mediating and Moderating effects of workplace social capital on the associations between adverse work characteristics and psychological distress among Japanese workers. *Ind Health* 2014;52:313–23.
- 37 Inoue A, Kawakami N, Eguchi H, et al. Buffering effect of workplace social capital on the association of job insecurity with psychological distress in Japanese employees: a cross-sectional study. *J Occup Health* 2016;58:460–9.
- 38 Sakuraya A, Imamura K, Inoue A, et al. Workplace social capital and the onset of major depressive episode among workers in Japan: a 3-year prospective cohort study. *J Epidemiol Community Health* 2017;71:606–12.
- 39 Kouvonen A, Oksanen T, Vahtera J, et al. Work-place social capital and smoking cessation: the Finnish public sector study. *Addiction* 2008;103:1857–65.
- 40 Väänänen A, Kouvonen A, Kivimäki M, et al. Workplace social capital and co-occurrence of lifestyle risk factors: the Finnish public sector study. *Occup Environ Med* 2009;66:432–7.
- 41 Sapp AL, Kawachi I, Sorensen G, et al. Does workplace social capital buffer the effects of job stress? A cross-sectional, multilevel analysis of cigarette smoking among U.S. manufacturing workers. *J Occup Environ Med* 2010;52:740–50.
- 42 Suzuki E, Fujiwara T, Takao S, et al. Multi-Level, cross-sectional study of workplace social capital and smoking among Japanese employees. *BMC Public Health* 2010;10:489.
- 43 Oksanen T, Kivimäki M, Kawachi I, et al. Workplace social capital and all-cause mortality: a prospective cohort study of 28,043 public-sector employees in Finland. *Am J Public Health* 2011;101:1742–8.
- 44 Inoue A, Kawakami N, Shimomitsu T, et al. Development of the New Brief Job Stress Questionnaire. In: Shimazu A, Bin Nordin R, Dollard M, et al, eds. *Psychosocial factors at work in the Asia Pacific: from theory to practice*. Cham: Springer International Publishing AG, 2016: 225–47.
- 45 Bilgel F, Karahasan BC. Self-Rated health and endogenous selection into primary care. *Soc Sci Med* 2018;197:168–82.
- 46 Tsuda K, Tsutsumi A, Kawakami N. Work-Related factors associated with visiting a doctor for a medical diagnosis after a worksite screening for diabetes mellitus in Japanese male employees. *J Occup Health* 2004;46:374–81.
- 47 Inoue A, Tsutsumi A, Eguchi H, et al. Organizational justice and refraining from seeking medical care among Japanese employees: a 1-year prospective cohort study. *Int J Behav Med* 2019;26:76–84.
- 48 Eguchi H, Tsutsumi A, Inoue A, et al. Psychometric assessment of a scale to measure bonding workplace social capital. *PLoS One* 2017;12:e0179461.
- 49 Szarota P. Smiling and happiness in cultural perspective. *Austral-Asian J Cancer* 2011;10:277–82.
- 50 Bertakis KD, Azari R, Helms LJ, et al. Gender differences in the utilization of health care services. *J Fam Pract* 2000;49:147–52.
- 51 Fujisawa Y, Hamano T, Takegawa S. Social capital and perceived health in Japan: an ecological and multilevel analysis. *Soc Sci Med* 2009;69:500–5.
- 52 Ichida Y, Kondo K, Hirai H, et al. Social capital, income inequality and self-rated health in Chita Peninsula, Japan: a multilevel analysis of older people in 25 communities. *Soc Sci Med* 2009;69:489–99.
- 53 Suzuki E, Yamamoto E, Takao S, et al. Clarifying the use of aggregated exposures in multilevel models: self-included vs. self-excluded measures. *PLoS One* 2012;7:e51717.
- 54 Tavakol M, Dennick R. Making sense of Cronbach's alpha. *Int J Med Educ* 2011;2:53–5.
- 55 Brook K. Labour market participation: the influence of social capital. *Labour Market Trends* 2005;3:113–23.
- 56 Diaz-Quijano FA. A simple method for estimating relative risk using logistic regression. *BMC Med Res Methodol* 2012;12:14.
- 57 Barros AJD, Hirakata VN. Alternatives for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimate the prevalence ratio. *BMC Med Res Methodol* 2003;3:21.
- 58 Ono H. Why do the Japanese work long hours? sociological perspectives on long working hours in Japan. *Jpn Labor Issues* 2018;2:35–49.
- 59 Oyserman D, Coon HM, Kimmelmeier M. Rethinking individualism and collectivism: evaluation of theoretical assumptions and meta-analyses. *Psychol Bull* 2002;128:3–72.
- 60 Hajek A, Bock J-O, König H-H. The role of personality in health care use: results of a population-based longitudinal study in Germany. *PLoS One* 2017;12:e0181716.
- 61 Pocnet C, Antonietti J-P, Massoudi K, et al. Influence of individual characteristics on work engagement and job stress in a sample of national and foreign workers in Switzerland. *Swiss Journal of Psychology* 2015;74:17–27.