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Association between affiliation with an *ikyoku* and workplace social capital: A preliminary study

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Abstract

Introduction: Workplace social capital (WSC), a workplace resource focusing on employees' perceptions of trust, reciprocity, and network interactions among colleagues and individuals of different hierarchical levels or organisations, has recently gained substantial attention in the field of medical education. The Japanese *ikyoku* system, a traditional unique postgraduate educational system that governs education, research, and patient care, could plausibly shape these relational climates; however, its association with WSC among medical residents remains unclear. In this study, we focused on the *ikyoku* system and aimed to elucidate the association between affiliation with *ikyoku* and WSC among residents of postgraduate year 3–6.

Methods: We conducted this cross-sectional study in December 2024 using an anonymous online self-administered survey in Japan. The survey was distributed to senior residents in 25 hospitals via their training directors. We assessed WSC using the Japanese medical resident version of the WSC Scale (score range: 1–5), which has previously demonstrated good validity and reliability. To investigate the association between affiliation with an *ikyoku* and WSC, we performed multivariable linear regression analysis, with adjustment for possible confounders.

Results: Sixty-one residents (response rate: 13.0%) were included in the final analysis. The majority were male (41, 67.2%) and in postgraduate years 3–4 (36, 59.0%). The results showed that there was no significant association between affiliation with an *ikyoku* and WSC score. The low response rate may limit generalisability.

Conclusion: The findings of this study will provide in-depth understanding of WSC. However, further larger-scale studies to confirm these findings are required.

Keywords: Workplace Social Capital, Ikyoku System, Japan, Medical Education

I. INTRODUCTION

Social capital refers to the resources available to individuals and groups through membership in their social networks (Fujikawa et al., 2024). While social capital can be observed at different levels, workplace social capital (WSC) is of particular interest internationally. WSC is defined as a workplace resource that focuses on employees' perceptions of trust, reciprocity, and network interactions that exist both among colleagues and among individuals belonging to different hierarchical levels or organisations (Tsounis et

al., 2023). In the field of medical education, a recent study has found that there are positive associations between WSC, subjective well-being, and work engagement among medical residents (Fujikawa et al., 2024). Thus, WSC is important for working-age individuals, including residents.

Although a number of determinants of WSC have been identified in fields outside medical education (e.g. cultural factors, employee demographics), few studies have elucidated the determinants of WSC in

postgraduate medical education. In Japan, medical trainees progress to a two-year early residency program after graduating from medical school (postgraduate years (PGY) 1–2). Upon successful completion of the program, they typically enter specialty training phase as senior residents (typically PGY 3–5, with some in later PGY levels such as PGY 6–7) (Nishigori, 2024). In this phase, many become affiliated with an *ikyoku* that is a Japanese organisational hierarchical system for physicians that have completed their early program. Each clinical department within university hospitals has an *ikyoku*, whose role is as follows: education, research, and patient care (Kuwabara et al., 2015). The heads of *ikyoku* are responsible for the teaching and research programs in their respective departments, as well as for the placement of *ikyoku* members in other affiliated hospitals. The *ikyoku* system has also been identified as a unique stressor affecting physicians in Japan (Ihara et al., 2020), further suggesting that *ikyoku* affiliation may possibly influence WSC and is therefore a meaningful determinant to examine in postgraduate training.

Here, we aimed to examine the association between affiliation with the *ikyoku* system and WSC among senior residents in Japan.

II. METHODS

A. Study Design, Setting, and Participants

We performed this cross-sectional study in December, 2024. The study formed one component of a series of WSC research projects in Japan. We distributed an anonymous, online, self-administered survey to senior residents (*senkouji* in Japanese) in PGY 3–6 at 25 hospitals via their training directors across Japan. The participants were informed that participation was voluntary. Follow-up email reminders were sent twice during the three-week survey period.

B. Outcome Variable: WSC

The outcome variable of the study was WSC, as assessed using the Japanese medical resident version of the WSC (JMR-WSC) Scale (Fujikawa et al., 2023; Kouvonen et al., 2006). The instrument has good reliability and validity (Fujikawa et al., 2023). It is composed of eight items. It also has the following two subscales; horizontal trust (i.e., trust in coworkers; Q1–5) and vertical trust (i.e., trust in supervisors; Q6–8) (Fujikawa et al., 2023).

All eight items are answered on a five-point Likert scale from strongly disagree (1) to strongly agree (5). The JMR-WSC Scale score is the average of all eight items. The subscale score is the average of its corresponding items. These scores range from 1 to 5, with a higher score indicating a higher level of WSC.

C. Explanatory Variable: Affiliated with an *Ikyoku* or Not

We asked the participants to choose one of the following three options regarding their relationship with *ikyoku* and used their responses as explanatory variables: (1) not affiliated with an *ikyoku* (reference category); (2) affiliated with an *ikyoku* and currently working at a university hospital; or (3) affiliated with an *ikyoku* and currently working at a hospital other than a university hospital. In this study, “affiliation with an *ikyoku*” referred to senior residents who were registered members of a university department’s *ikyoku*, even if they were currently assigned to and working at an affiliated non-university hospital. In this model, the university department (through *ikyoku* leadership) continues to oversee staffing decisions and professional development, and may rotate members across hospitals within its network. Thus, *ikyoku* affiliation reflects an ongoing organisational and sociocultural link to the university, rather than merely the resident’s current physical workplace.

To reduce misclassification, the questionnaire included brief definitions of each category (including “affiliated with an *ikyoku* and currently working at a university hospital” and “affiliated with an *ikyoku* and currently working at a non-university hospital”).

D. Covariates

Covariates were selected with reference to previous studies (Fujikawa et al., 2024; Kouvonen et al., 2006; Tsounis et al., 2023), and included gender (man (reference category), woman, or non-binary), PGYs (3–4 (reference category) or 5–6), and clinical department (internal medicine (reference category), surgical medicine, or other departments (e.g., dermatology, psychiatry)).

E. Statistical Analysis

We conducted multivariable linear regression analysis, with adjustment for possible confounders. We reported regression coefficients with 95% confidence intervals (CIs) to allow interpretation of effect sizes. Prior to the analysis, statistical assumptions for the linear regression analysis (e.g., normality, linearity) were checked and met. We decided to choose complete case analysis because of the small amount of missing data (i.e., less than 5% in our data). A two-tailed p-value < 0.05 was considered significant. All statistical analyses were performed using SPSS ver. 29.0.2.0 (IBM Corp).

F. Ethical Considerations

The study was approved by the ethics committee of Keio University School of Medicine (approval number: 20231224).

III. RESULTS

Of the 470 potential participants, 63 provided responses to our questionnaire. After excluding 2 with missing data, the remaining 61 were included in the analysis. The participants' characteristics are summarised in Table 1.

Table 1 also demonstrates the results of multivariable linear regression analysis. There was no significant association between affiliation with an *ikyoku* and WSC total score (affiliated with an *ikyoku* and currently working at a university hospital: adjusted mean difference -0.23, 95% CI -0.74 to 0.28, $p = 0.37$; affiliated with an *ikyoku* and currently working at a hospital other than a university hospital: adjusted mean difference -0.33, 95% CI -0.87 to 0.21, $p = 0.22$). There were also no significant associations between affiliation with an *ikyoku* and WSC subscale score.

Participant profile				
Characteristics	Total (N = 61)	Not affiliated with an <i>ikyoku</i> (N = 19)	Affiliated with an <i>ikyoku</i> and currently working at a university hospital (N = 23)	Affiliated with an <i>ikyoku</i> and currently working at a hospital other than a university hospital (N = 19)
Gender, N (%)				
Woman	19 (31.1)	6 (31.6)	8 (34.8)	5 (26.3)
Man	41 (67.2)	13 (68.4)	14 (60.9)	14 (73.7)
Non-binary	1 (1.6)	0	1 (4.3)	0
PGY, N (%)				
3–4	36 (59.0)	12 (63.2)	14 (60.9)	10 (52.6)
5–6	25 (41.0)	7 (36.8)	9 (39.1)	9 (47.4)
Clinical department, N (%)				
Internal medicine	29 (47.5)	13 (68.4)	9 (39.1)	7 (36.8)
Surgical medicine	26 (42.6)	3 (15.8)	12 (52.2)	11 (57.9)
Others	6 (9.8)	3 (15.8)	2 (8.7)	1 (5.3)
WSC^a, mean (SD)				
Total	4.20 (0.73)	4.37 (0.66)	4.16 (0.78)	4.09 (0.75)
Horizontal trust	4.12 (0.75)	4.28 (0.72)	4.13 (0.76)	3.96 (0.77)
Vertical trust	4.33 (0.84)	4.51 (0.70)	4.22 (0.96)	4.30 (0.85)
Association between affiliation with an <i>ikyoku</i> and WSC				
	Unadjusted mean difference (95% CI)	p-value	Adjusted ^b mean difference (95% CI)	p-value
WSC total^a				
Not affiliated with an <i>ikyoku</i>	Ref.	Ref.	Ref.	Ref.
Affiliated with an <i>ikyoku</i> and currently working at a university hospital	-0.21 (-0.66 to 0.25)	0.37	-0.23 (-0.74 to 0.28)	0.37
Affiliated with an <i>ikyoku</i> and currently working at a hospital other than a university hospital	-0.28 (-0.76 to 0.20)	0.24	-0.33 (-0.87 to 0.21)	0.22
Horizontal trust^a				
Not affiliated with an <i>ikyoku</i>	Ref.	Ref.	Ref.	Ref.
Affiliated with an <i>ikyoku</i> and currently working at a university hospital	-0.15 (-0.62 to 0.31)	0.51	-0.23 (-0.75 to 0.29)	0.38
Affiliated with an <i>ikyoku</i> and currently working at a hospital other than a university hospital	-0.33 (-0.81 to 0.16)	0.19	-0.43 (-0.97 to 0.12)	0.13
Vertical trust^a				
Not affiliated with an <i>ikyoku</i>	Ref.	Ref.	Ref.	Ref.
Affiliated with an <i>ikyoku</i> and currently working at a university hospital	-0.29 (-0.82 to 0.24)	0.27	-0.23 (-0.81 to 0.35)	0.43
Affiliated with an <i>ikyoku</i> and currently working at a hospital other than a university hospital	-0.21 (-0.76 to 0.34)	0.45	-0.18 (-0.80 to 0.44)	0.56

Abbreviations: CI, confidence interval; PGY, postgraduate year; SD, standard deviation; WSC, workplace social capital

^aRanging from 1 to 5, with higher scores indicating greater WSC.

^bAdjusted for gender, postgraduate year, and clinical department.

Table 1. Participant profile and association between affiliation with an *ikyoku* and WSC

IV. DISCUSSION

We found that affiliation with an *ikyoku* was not significantly associated with WSC. This finding suggests that, in Japan and in other Asia–Pacific training systems with comparable hierarchical, university- or specialty-based networks, formal affiliation alone may not be sufficient to enhance WSC.

This study revealed that there was no significant association between affiliation with an *ikyoku* and WSC. This finding was unexpected, given a previous study that suggested that WSC is contextually patterned (Kouvonen et al., 2006; Oksanen et al., 2013). The *ikyoku* system has the potential to exert a dual impact on WSC, exhibiting both favorable and unfavorable outcomes. While the system can function as an organised support structure and likely cultivates interpersonal trust and mutual support, it is also subject to the possibility of being linked to distinctive stressors, such as rigid hierarchies and limited autonomy in career decision-making (Kuwabara et al., 2015). These stressors may inhibit the formation of psychologically safe and supportive workplace environment (Ihara et al., 2020). Taken together, these opposing mechanisms - formal support and continuity of supervision versus hierarchical control and constrained autonomy - may coexist and offset one another, which could help explain the absence of a statistically significant association in this sample. However, the results of our study indicated that the point estimates for affiliation with an *ikyoku* were all negative. This pattern suggests that, in practice, the restrictive and hierarchical aspects of *ikyoku* may potentially outweigh its benefits for trust and reciprocity. Consequently, a negative association between affiliation with an *ikyoku* and WSC may become evident in a larger-scale study.

Finally, we should note the limitations of the study. First, the number of participants and the response rate were relatively low. As described above, it is possible that the relatively small sample size led to inadequate statistical power, and consequently yielded non-significant results. The relatively low response rate (13.0%) might raise concerns for the potential of non-response bias. Busier residents may have been less likely to respond to the questionnaire. Future studies should include more participants and try to maximise the response rate (e.g., direct recruitment, incentives). Second, the participant characteristics showed male dominance (67.2%) and skew toward internal/surgical medicine, limiting generalisability. Third, the survey was distributed via training directors, which may have led some residents to respond in a socially desirable manner, even though the responses were anonymised and not accessible to the directors. Fourth, although covariates were selected based on previous studies, unknown confounding factors

might have affected the results. For example, while measuring residents' cooperativeness and career orientation is indeed challenging, these factors could be unmeasured confounders.

V. CONCLUSION

This preliminary study suggests that relying solely on traditional departmental structures may not be enough to promote WSC. Supervisors may need to intentionally cultivate WSC at the local level. Although the findings provide in-depth insight into WSC, confirmation in further larger-scale studies is warranted.

Notes on Contributors

HF conceptualised the study, developed the methodology, conducted the data analysis, wrote the original draft, and reviewed and edited the manuscript. TA supervised the conceptualisation and methodology of the study, and reviewed and edited the manuscript. ME supervised the conceptualisation and methodology of the study, and reviewed and edited the manuscript. Finally, all authors discussed, proofread, and approved the final version of the manuscript.

Ethical Approval

Prior to participation, all study participants provided informed consent by checking a consent box on the survey. This study was approved by the ethical committee of Keio University School of Medicine (no. 20231224).

Data Availability

The data that support the findings of this study are not publicly available; however, upon reasonable request, the data can be obtained from the corresponding author.

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Declaration of Interest

The authors report there are no competing interests to declare.

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