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RESEARCH ARTICLE

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Work environment for hospital nurses in Japan: The relationships between nurses' perceptions of their work environment and nursing outcomes

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Abstract

Aim: To investigate nurses' perceptions of their work environment and to investigate the relationships between variables measuring the work environment (WE) and nursing outcomes (NOs).

Design: A 2-year prospective longitudinal survey (2013–2015).

Method(s): Descriptive statistics of nurse demographics, organizational WE and NOs were calculated by position. The associations between Practice Environment Scale of the Nursing Work Index (PES-NWI) and NOs were examined for each unit.

Results: The participants were 2,992 staff nurses, 137 nurse managers (NMs), and 8 chief nursing officers in Phase 1 and 7,849, 371 and 23 in Phase 2, respectively. The higher the job position, the better the WE was rated. The higher the PES-NWI scores, the better the outcomes. Descriptive statistics about organizational WEs and NOs and the statistically significant associations between the two were identified.

KEYWORDS
cohort studies, nurses, occupational health, personnel turnover, workplace

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1 | INTRODUCTION

Recent studies have revealed that nurses' work environments play an important role in their ability to provide quality care. As suggested by the Healthy Work Organization Model of the National Institute for Occupational Safety and Health (NIOSH) (Sauter et al., 1996), the work environment affects a nurse's health, satisfaction, and performance. For example, previous studies have linked poor work environment to poor outcomes for nurses, such as adverse events (Hall et al., 2008; Institute of Medicine, 2004). Additionally, a poor work environment can affect the quality of care through nurses' job stress, low job satisfaction, and high turnover (Brown et al., 2013; Flinkman et al., 2010; Hayes et al., 2012; Hayes et al., 2006). Developing knowledge of nurses' work environments requires representative, large, longitudinal data that can be used to examine causal relationships and make international comparisons.

Nursing work environments have been measured by various instruments. One of the most famous measures, the Practice Environment Scale of the Nursing Work Index (PES-NWI) (Lake, 2002), was developed based on items of the Nursing Work Index (NWI) that show the characteristics of magnet hospitals (McClure et al., 1983). The PES-NWI includes five subscales: "Nurse manager ability, leadership, and support of nurses," "Collegial nurse–physician relations," "Nurse participation in hospital affairs," "Foundations for quality of care" and "Staffing and resource adequacy." Although it covers most elements of the organizational work environment, this scale lacks elements of organizational culture and interprofessional collaboration, compared with models of healthy work environment from the American Association of Critical-Care Nurses (2016) and NIOSH (Saulter et al., 1996). Additionally, the importance of relatively new concepts about human relationships that affect team or organizational performance, such as bullying, followership, and interprofessional work, is increasing. Workplace bullying is a serious problem in the work environment, but few studies have investigated that topic in Japan (Tsuno et al., 2010). Both followership and competency of interprofessional work are important for teamwork, but few studies have measured these, due to the lack of a common measurement instrument. Therefore, a study that includes these new concepts is necessary to describe the recent nursing practice environment.

Furthermore, the lack of studies in evaluating nursing work environments from the viewpoint of nurse managers may hinder the development of knowledge. It has been suggested that the perception of the workplace environment differs according to position and responsibilities, and that only the staff nurse can properly evaluate it (Kramer & Schmalenberg, 2008). However, to clarify the influence of human relationships at work, both non-managerial nurses and nurse managers should be included in the same study, because human relationships are interactive. Leadership by nurse managers is a part of staff nurses' work environment, and it is included in the PES-NWI. For nurse managers, followership or nursing ability of staff nurses might characterize their human environment at work.

2 | BACKGROUND

In Japan, there are various processes for a staff nurse to become a nurse manager (NM) and chief nursing officer (CNO). Before a staff nurse can become a NM and CNO, they first work as a preceptor for novice nurses or a bedside training instructor for students, after a few years of work as a staff nurse. Most nurses are staff nurses, and they work at the "front line" to give nursing care to patients based on patients' needs, under the leadership of NMs. Additionally, they work with medical doctors and other medical professionals as a team. Depending on the hospital, nurses must take a promotion test to be an assistant nurse manager, NM and CNO. Systematic education programmes certified by the Japanese Nursing Association and master's programmes for qualifying nursing managers are relatively recent. A considerable number of NMs did not have an opportunity to learn business management of a hospital (Katsuhara, 2005). This may worsen the work environment not only for staff nurses, but also for NMs themselves.

In Japan, where there are no national data of hospital nurses' work environments, there is a lack of longitudinal and large-scale data that consider multiple job positions. This makes it difficult to grasp the whole picture of the work environment, to examine causal relationships, and to make international comparisons. Therefore, the purpose of the current study was to investigate nurses' perceptions of their work environment and the relationships between their work environments and nursing outcomes. The WENS-J was a 2-year, relatively large longitudinal study whose ultimate goals are to identify the features of "healthy" work environments for hospital nurses in Japan, by verifying the associations between the features of the work environment, especially human relationships at work, and nurse outcomes such as job satisfaction, retention or resignation, and health status. However, this study focuses on providing these descriptive statistics as reference data for future research and examining the associations between work environment and nurse outcomes per hospital unit, before aiming for the final goals in subsequent studies.

3 | METHODS

3.1 | Design

This study is a prospective, multicentre, longitudinal study carried out by a two-year national survey in two main phases (Figure 1). In Phase 1, surveys were administered at eight hospitals (December 2013–August 2014), whereas in Phase 2, a total of 23 hospitals participated in the surveys (July 2014–April 2015). The following two parts were administered during each phase: (a) a baseline survey collected via a self-administered questionnaire given to staff nurses, NMs, CNOs and hospital nursing departments; and (b) a follow-up survey collected via a self-administered questionnaire to explore whether staff nurses, NMs, and CNOs had resigned from their hospitals at the end of the fiscal year (i.e., the end of

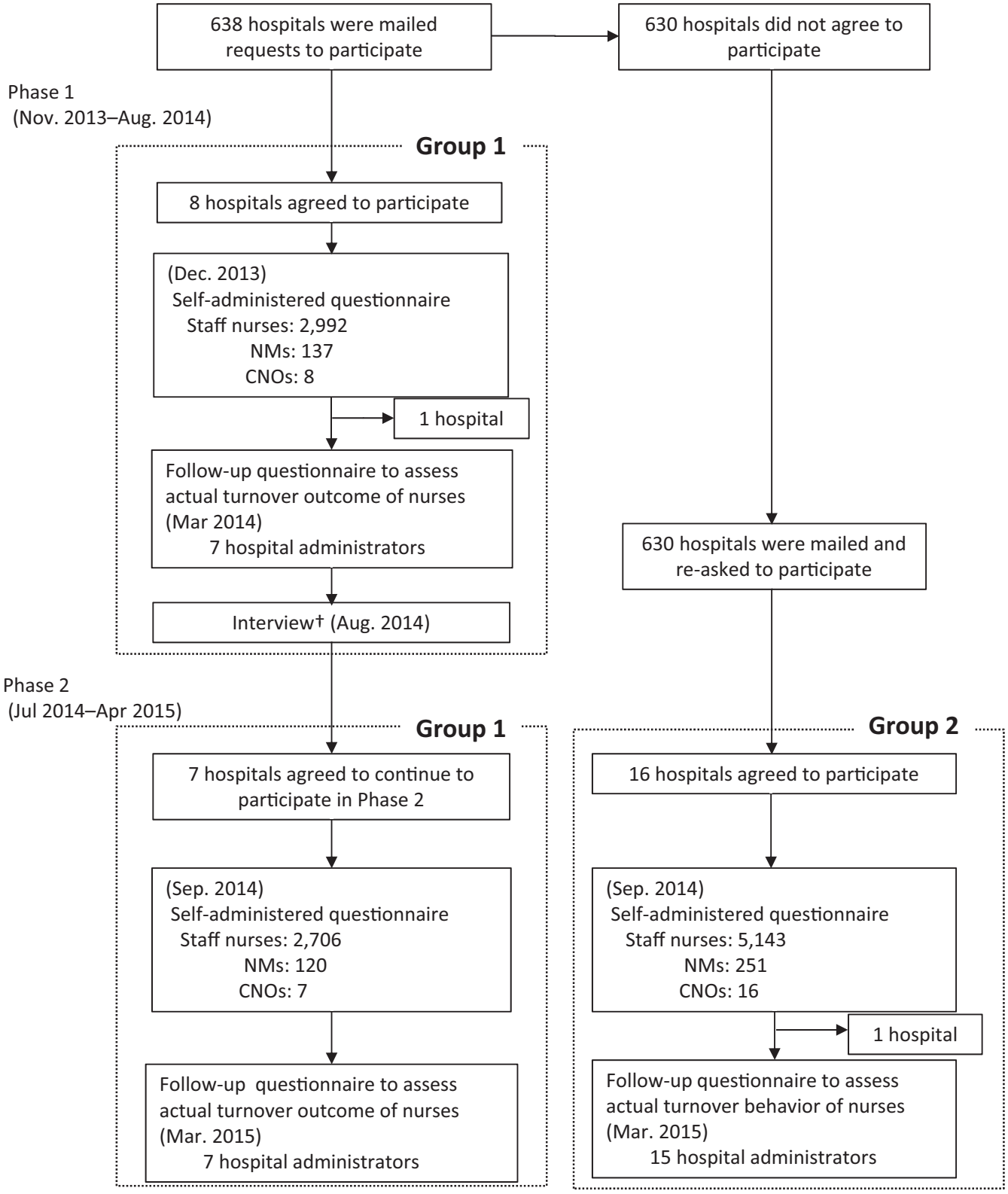

FIGURE 1 Enrolment of Study Participants from Groups 1 and 2 in Phases 1 and 2

CNO: chief nursing officer; NM, nurse manager.

†Staff nurses and NMs who worked at six hospitals in Tokyo or Kanagawa prefectures were randomly selected from those who agreed to participate in the interview surveys.

Note: The answers in the self-administered questionnaire in Phase 2 could be nurse outcomes for the answers in the questionnaire in Phase 1.

March). In addition to components (a) and (b), the first phase included (c) interviews about "healthy" work environment with staff nurses and NMs.

3.2 | Setting and participants

The participants in the first phase were eight hospitals (2,992 staff nurses, 137 NMs and 8 CNOs) out of the 638 hospitals in Japanese cities with populations greater than 200,000. They were all non-university hospitals with more than 200 beds. In November 2013, we mailed the questionnaires to each hospital and asked nurse administrators to assign identification numbers (IDs) to each potential participant and deliver the questionnaires and ID information to staff nurses, NMs, and CNOs. After the participants completed the questionnaires, they sealed the responses in provided envelopes and directly returned them to the WENS-J project team anonymously. At the time of the follow-up survey, the nurse administrators were asked to provide the IDs of staff members who had resigned from employment at the hospitals. None of the nurses' names were ever disclosed to us. In the middle of Phase 1, one hospital dropped out of the survey.

To initiate Phase 2, in July and August 2014 we asked 630 hospitals, in addition to the previous eight, to participate in the surveys to increase the sample size. In total, 23 hospitals (7,849 nurses, 371 NMs and 23 CNOs) participated in Phase 2. We mailed the questionnaires to the hospitals to deliver to staff nurses, NMs and CNOs in September and October 2014. The survey process in Phase 2 was same as that in Phase 1, except for the interviews.

3.3 | Ethical consideration

The study protocol was approved by the Institutional Review Board of the university with which the first author was affiliated (Approval numbers 1674 and M2018-065). Participants received a written description of the study that outlined its aims and procedure, the voluntary and anonymous nature of participation, and their confidentiality. To assure anonymity, we used a linkable anonymizing method with the IDs. The WENS-J project team was unable to access the link information. The return of the questionnaire was considered to indicate consent to participate.

3.4 | Measures

Figure 2 shows the conceptual framework of this study. It was developed through discussion among WENS-J research members based on models such as the healthy work organization model (Sauter et al., 1996), healthy work environments (American Association of Critical-Care Nurses, 2016) and the PES-NWI (Lake, 2002).

3.4.1 | Baseline survey

The survey involved the following variables: demographic and socioeconomic status of nurses, scales for organizational work environment and nurse outcomes (Appendix 1), and apart from the items asked of nurses, we collected the characteristics of the participating hospitals, such as number of beds, nurse/patient ratio, and average length of stay.

3.4.2 | Organizational work environments

Organizational work environments were investigated using the following scales: PES-NWI, Followership, Psychological Empowerment (PE) Instrument, Chiba Interdisciplinary Competency Scale (CICS29), and Competing Values of Framework (CVF) and Negative Acts Questionnaire Revised. Each scale of organizational work environment was selected based not only on the human environment, but also on its importance for nurse outcomes, after discussion among WENS-J research members.

PES-NWI was developed based on the characteristics of magnet hospitals and measures the nursing practice environment. It consists of five subscales, and its Japanese version has shown acceptable validity and reliability (Ogata et al., 2018). A higher score means a better nursing practice environment. Fourteen items on followership were newly created based on discussions among nursing researchers, using concepts of followership by Kelley (1992), Kellerman (2008), and Chaleff (2009).

PE was measured by the Psychological Empowerment Instrument (Spreitzer, 1995), which consists of four subscales: meaning, competence, self-determination, and impact. Each subscale score was calculated as the mean of the three items measuring the associated dimension. Higher subscale scores mean that the respondent is more empowered psychologically.

CICS29 measures competencies of interprofessional practice, and consists of 29 items divided into six subscales: attitudes and beliefs as a professional, team management skills, actions for accomplishing team goals, providing care that respects patients, attitudes and behaviour that improve team cohesion, and fulfilling one's role as a professional (Sakai et al., 2017). Higher scores mean higher competency of interprofessional collaborative practice.

The CVF (Cameron & Freeman, 1991) arranged by Kitai (2011) was used to assess organizational culture in this study. Negative Acts Questionnaire Revised is a single question with free description about specific experience, which confirms whether or not the participant was bullied at the workplace in the past six months (Einarsen et al., 2009; Tsuno et al., 2010).

For NMs, items about nursing management were asked, in addition to the above items about organizational work environment. For CNOs, items of the PES-NWI, CICS and followership were excluded from the questionnaire.

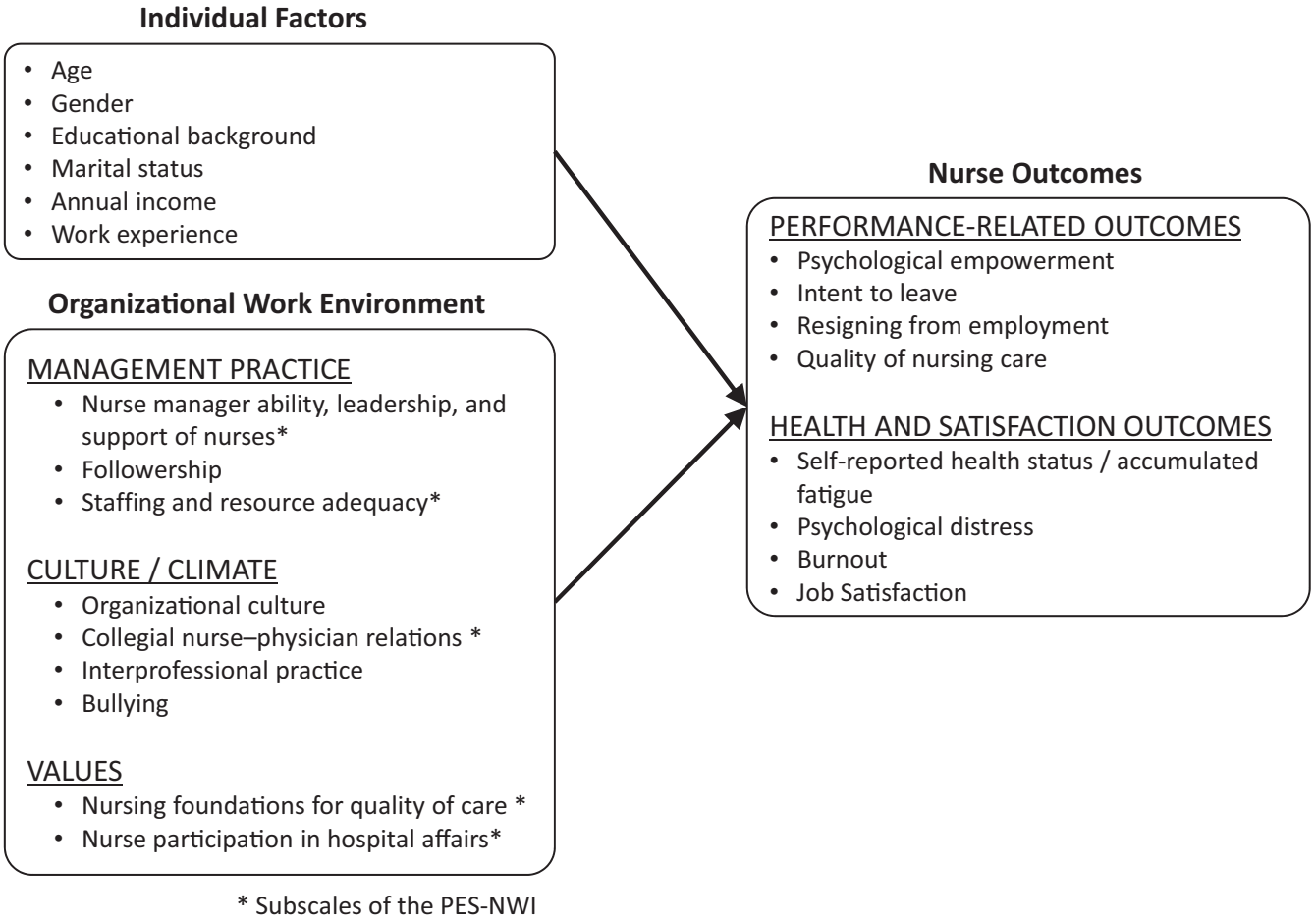

FIGURE 2 Conceptual framework for this study.
PES-NWI: the Practice Environment Scale of the Nursing Work Index.

3.4.3 | Nurse outcomes

The items of self-reported health status, accumulated fatigue, psychological distress, burnout, job satisfaction, quality of nursing care, intention to remain in or leave employment, and resignation were assessed as nurse outcomes. To determine nurses' overall health status, a single item of self-rated health condition was asked by a 5-point Likert scale. A single item about accumulated fatigue was asked by a 4-point Likert scale. The Kessler Psychological Distress Scale (K6) (Furukawa et al., 2003) was administered to measure psychological distress. To assess nurses' burnout status, the Japanese Burnout Scale (JBS), which was developed based on the characteristics of Japanese human services organizations, including hospitals (Tao & Kubo, 1996), was given. The JBS has three dimensions equivalent to the three subscales of the Maslach Burnout Inventory (Maslach et al., 2001): "emotional exhaustion (EE)," "depersonalization (DP)," and "personal accomplishment (PA)." Higher EE and DP scores and lower PA scores mean a more burnout state. Vertical 100-mm visual analogue scales (VAS) were used (range: 0–100) to measure "job satisfaction" and "quality of nursing care." To measure the tendency to remain working at the current hospital, a single question was asked. Other items were asked of NMs and CNOs as nurse outcomes in addition to the above items, including difficulties and feelings of worth in managerial work, and the availability of advisors to them.

3.4.4 | Follow-up survey

A follow-up survey among CNOs was conducted to confirm whether staff nurses and NMs had resigned as of March 2014 (Phase 1) or March 2015 (Phase 2), respectively. The IDs of nurses who had resigned from the current hospital at the end of the fiscal year were provided by the hospitals' directors of nursing.

3.5 | Statistical analysis

To provide a complete description of the WENS-J data, summary statistics were calculated for each job title (staff nurses, NMs, and CNOs) during Phases 1 and 2 among Group 1 (7 hospitals) and during Phase 2 among Group 2 (16 hospitals added in 2014). Furthermore, to examine the association between the PES-NWI and nurse outcomes, job satisfaction, quality of nursing care, self-reported health status and accumulated fatigue were examined for each unit, with

pairwise case deletion. Analyses were performed with Stata version 13.1 (StataCorp, College Station, TX, USA) for descriptive statistics, and JMP® 14.2 (SAS Institute, Inc., Cary, NC, USA) for correlation between work environment and nurse outcomes.

4 | RESULTS

Among the 23 hospitals that participated in the WENS-J, 22 participated until the second follow-up survey, which was administered at the end of March 2015. At those 23 hospitals, the number of beds ranged between 211–875, with a mean of 426.1 (*SD* 197.4). The fee category based on the ratio of patients to nurses was the highest (7:1) at all 23 hospitals. The average length of stay ranged from 15.4–15.8 days across hospitals. Twenty hospitals (87.0%) had been accredited by the Japan Council for Quality Health Care.

Summary statistics of not only nurses' demographics and socioeconomic status, but also organizational work environment factors and nurse outcomes, are shown for staff nurses, NMs, and CNOs in Tables 1–3, respectively. In each table, the results are shown for three subgroups: Group 1 in Phase 1 and Phase 2, and Group 2 in Phase 2.

Cronbach's alpha coefficient for total PES-NWI scores about answers from staff nurses in Phase 2 was 0.83 for the composite, and alphas for each subscale ranged from 0.79–0.88. Table 4 shows the correlations between PES-NWI scores and nurse outcomes by the mean for each unit. The higher the PES-NWI scores, the better the nurse outcomes.

5 | DISCUSSION

This is the first study to report the descriptive statistics of nurses' characteristics, organizational work environment factors and nurse outcomes of middle-sized hospitals in Japan, using the WENS-J data. Because of the space limitation for this paper, we will not be able to discuss all of the results from this study in depth.

As regards the nurses' characteristics, most participants were female regardless of position (92.4%–100.0%). Although the highest educational background of most staff nurses and NMs was "Other," approximately 15% of participants of all positions in group 1 were university graduates; there were no NMs and CNOs with a bachelor's degree in group 2. Because the number of Japanese universities with a nursing program increased from 3 in 1991–272 in 2019 (Ministry of Education, Culture, Sports, Science and Technology, 2019), educational background in nursing might differ by generation.

To measure the workplace environment, the PES-NWI was used, because magnet status and healthy work environments have a strong connection (Ritter, 2011). Because NMs' mean PES-NWI scores were consistently higher than those of staff nurses (Tables 1 and 2), different perceptions of work environment between the two might warrant consideration by NMs to realize a healthy work environment. The average of composite PES-NWI scores varied among previous studies, such as 2.95 for original magnet hospitals and 2.65 for original non-magnet hospitals (Lake, 2002), 2.30–3.07 in an updated review of the PES-NWI (Swiger et al., 2017), and, for Japanese staff nurses, 2.47 (Ogata et al., 2011) and 2.61 (Anzai et al., 2014). Although the scores of staff nurses in this study were close to the scores of Japanese nurses from previous studies, they were lower than those seen in the original magnet and non-magnet hospitals. The fact that Japanese nurses are younger than nurses in other countries might be a reason for this difference (Ogata et al., 2018). Clarification about the reason for the difference is needed to facilitate international comparative studies about nurses' workplace environments.

This study's questionnaire included bullying, followership, and interprofessional work as relatively new aspects of the work environment. Although it is difficult to evaluate the results for followership and interprofessional work because of the lack of previous studies investigating these constructs, we found that staff nurses showed a relatively high degree of followership and interprofessional competencies. Experience of bullying, answered as a frequency, differed according to the nurses' positions in this study, and was lower than indicated by the finding of Spector et al., which was 22.8% in the past 6 months (Spector et al., 2014). Further investigation of this topic is needed.

As Regards the nurse outcomes, the averages of job satisfaction and quality of nursing care scores seemed to increase with increasing prestige of job title in the current study. Unsurprisingly, NMs had weaker intention to leave than staff nurses. Turnover rates were higher among staff nurses than NMs and CNOs, although the rates were lower than the 2015 national average of 10.9% (Japanese Nursing Association, 2017). Future studies should search for a causal relationship between the workplace environment and nurse outcomes to attract nurses and achieve quality care. Although many previous studies have shown that nurse outcomes such as job satisfaction, intent to leave, burnout, and work engagement have statistically significant associations with the PES-NWI subscales and/or composite score (Swiger et al., 2017; Warshawsky & Havens, 2011), they were not necessarily longitudinal studies.

The relationships between the composite of the PES-NWI and nurse outcomes show that outcomes might improve as the work environment is improved overall. On the other hand, associations between the subscale scores and nurse outcomes for staff nurses show that different work environment factors might relate to different types of outcomes (Table 4). For instance, NMs who would like to achieve a better health status and less accumulated fatigue for staff nurses should aim for appropriate staffing for each unit.

5.1 | Impact of the WENS-J on health policy, nursing science, and management

The effects of population ageing on the labour market are a common concern for many countries (Serban, 2012; The Japan Institute for Labour Policy & Training, 2016; United Nations, 2015). Because

TABLE 1 Summarized data set for staff nurses in groups 1 and 2 during phases 1 and 2

	Group 1[a] (7 hospitals)						Group 2[a] (16 hospitals)		
	Phase 1, 2013			Phase 2, 2014			Phase 2, 2014		
	n = 918			*n* = 867			*n* = 2301		
	n	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*
Socio-demographic status									
Age (years)	902	34.2	10.0	843	34.1	9.4	2,261	34.4	9.3
Years worked as a nurse	883	11.1	9.3	827	10.8	8.6	2,193	10.6	8.4
	n	%		*n*	%		*n*	%	
Sex									
Female	879	95.8		836	96.4		2,126	92.4	
Male	34	3.7		26	3.0		164	7.1	
Missing	5	0.5		5	0.6		11	0.5	
Education									
Bachelor's degree	152	16.6		130	15.0		338	14.7	
Master's degree (graduate school)	9	1.0		9	1.0		26	1.1	
Other[b]	751	81.8		720	83.0		1,929	83.8	
Missing	6	0.7		8	0.9		8	0.4	
Marital status									
Married	354	38.6		320	36.9		971	42.2	
Unmarried/widowed/divorce	555	60.5		539	62.2		1,313	57.1	
Missing	9	1.0		8	0.9		17	0.7	
Individual annual income[c] (×10,000 yen)									
≤500	596	64.9		621	71.6		1,711	74.4	
501–800	293	31.9		210	24.2		487	21.2	
≥801	4	0.4		2	0.2		3	0.1	
Missing	25	2.7		34	3.9		100	4.4	
Household annual income[c] (×10,000 yen) (excluding own income)									
None	304	33.1		273	31.5		685	29.8	
≤500	280	30.5		261	30.1		788	34.3	
≥501	276	30.1		263	30.3		654	28.4	
Missing	58	6.3		70	8.1		174	7.6	
Organizational work environment									
PES-NWI (composite) (1–4)	861	2.6	0.4	793	2.6	0.4	2,067	2.6	0.4
Followership (14–70)	878	41.6	8.6	835	41.1	9.1	2,222	40.5	9.2
Empowerment (composite) (0–7)	911	3.9	0.9	854	3.9	0.8	2,253	3.8	0.9
CICS (0–145)	887	100.1	14.5	837	99.2	15.3	2,221	99.3	15.3
CVF (1–5): Clan	915	3.0	0.7	861	3.1	0.7	2,278	3.1	0.7
Adhocracy	913	3.5	0.6	860	3.4	0.6	2,277	3.4	0.6
Hierarchy	914	2.9	0.6	857	2.9	0.6	2,269	2.9	0.6
Market	913	3.3	0.6	861	3.3	0.6	2,278	3.2	0.6

(Continues)

TABLE 1 (Continued)

	n	%		*n*	%		*n*	%	
Bullying experience in previous 6 months									
No	818	89.1		766	88.4		2,029	88.2	
Yes (Rarely–Almost every day)	70	7.6		64	7.4		192	8.3	
Missing	30	3.3		37	4.3		80	3.5	
	n	**Mean**	***SD***	***n***	**Mean**	***SD***	***n***	**Mean**	***SD***
Outcomes									
K6 (0–24)	903	5.0	4.9	853	5.0	5.1	2,279	4.7	4.9
Burnout: Emotional exhaustion (5–25)	911	17.1	4.7	859	16.7	4.7	2,279	16.6	5.0
Depersonalization (6–30)	908	13.2	5.0	848	13.4	5.1	2,261	12.9	5.0
Personal accomplishment (6–30)	909	15.0	4.5	861	14.6	4.3	2,277	14.6	4.3
Job satisfaction (0–100)	913	49.9	26.4	859	50.3	25.6	2,281	50.0	25.8
Quality of nursing care (0–100)	913	50.9	22.8	859	51.0	22.5	2,280	50.8	22.5
	n	**%**		***n***	**%**		***n***	**%**	
Self-reported health status									
Healthy or moderately healthy	632	68.8		625	72.1		1,545	67.1	
Neither	139	15.1		123	14.2		353	15.3	
Not very healthy	113	12.3		95	11.0		326	14.2	
Not healthy	23	2.5		14	1.6		47	2.0	
Missing	11	1.2		10	1.2		30	1.3	
Self-reported accumulated fatigue									
I don't feel tired	9	1.0		14	1.6		36	1.6	
I feel tired but I am recovering the next day	269	29.3		246	28.4		667	29.0	
I often get tired after the next day	443	48.3		414	47.8		1,048	45.6	
I'm always tired, even on holidays	189	20.6		186	21.5		520	22.6	
Missing	8	0.9		7	0.8		30	1.3	
Intent to leave									
Will remain	353	38.5		288	33.2		791	34.4	
May remain	329	35.8		392	45.2		1,027	44.6	
May leave	97	10.6		99	11.4		277	12.0	
Will leave	72	7.8		62	7.2		156	6.8	
Missing	67	7.3		26	3.0		50	2.2	
Resigned from employment									
No	753	82.0		727	83.9		1,914	83.2	
Yes	36	3.9		55	6.3		147	6.4	
Missing	129	14.1		85	9.8		240	10.4	

Abbreviations: CICS, Chiba Interdisciplinary Competency Scale; CVF, Competing Values Framework; K6, six items from the Kessler Psychological Distress Scale; PES-NWI, Practice Environment Scale of the Nursing Work Index.

[a]The hospitals in Group 1 enrolled in the study in 2013 (Phases 1 and 2), and the hospitals in Group 2 enrolled in 2014 (only Phase 2).

[b]Other: diploma/associate degree, graduated from nursing school or 3-year junior college, and vocational nurses (graduated from vocational nursing courses).

[c]$1 (US) = 110 yen as of May 2019.

TABLE 2 Summarized data set of nurse managers in groups 1 and 2 in phases 1 and 2

	Group 1[a] (7 hospitals)						Group 2[a] (16 hospitals)		
	Phase 1, 2013			Phase 2, 2014			Phase 2, 2014		
	n = 95			*n* = 59			*n* = 171		
	n	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*
Socio-demographic status									
Age (years)	95	47.6	7.0	59	46.4	6.4	170	48.8	6.8
Years worked as a nurse	92	25.1	7.2	55	23.9	6.2	162	26.2	7.1
	n	%		*n*	%		*n*	%	
Sex									
Female	90	94.7		58	98.3		165	96.5	
Male	2	2.1		1	1.7		5	2.9	
Missing	3	3.2		0	0.0		1	0.6	
Education									
Bachelor's degree	16	16.8		9	15.3		0	0.0	
Master's degree (graduate school)	4	4.2		3	5.1		12	7.0	
Other[b]	73	76.8		47	79.7		158	92.4	
Missing	2	2.1		0	0.0		1	0.6	
Marital status									
Married	59	62.1		35	59.3		103	60.2	
Unmarried/widowed/divorce	36	37.9		23	39.0		67	39.2	
Missing	0	0.0		1	1.7		1	0.6	
Individual annual income[c] (×10,000 yen)									
≤500	4	4.2		9	15.3		29	17.0	
501–800	78	82.1		47	79.7		126	73.7	
≥801	9	9.5		2	3.4		13	7.6	
Missing	4	4.2		1	1.7		3	1.8	
Household annual income[c] (×10,000 yen) (excluding own income)									
None	29	30.5		22	37.3		50	29.2	
≤500	20	21.1		9	15.3		50	29.2	
≥501	43	45.3		26	44.1		65	38.0	
Missing	3	3.2		2	3.4		6	3.5	
	n	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*
Organizational work environment									
PES-NWI (composite) (1–4)	90	2.8	0.3	54	2.7	0.3	150	2.7	0.3
Followership (14–70)	93	44.3	8.3	58	42.9	8.9	167	43.0	8.6
Empowerment (composite) (0–7)	95	4.8	0.8	59	4.7	0.6	168	4.7	0.8
CICS (0–145)	94	116.6	11.0	57	113.0	11.1	162	111.0	11.7
CVF (1–5): Clan	95	2.6	0.5	59	2.6	0.5	169	2.7	0.5
Adhocracy	95	3.1	0.5	59	3.3	0.6	169	3.1	0.5
Hierarchy	95	2.7	0.5	59	2.8	0.5	170	2.7	0.4
Market	94	3.1	0.6	58	3.1	0.6	169	3.1	0.5

(Continues)

TABLE 2 (Continued)

	n	%		*n*	%		*n*	%	
Bullying experience in previous 6 months									
No	88	92.6		56	94.9		161	94.2	
Yes (rarely–almost every day)	6	6.3		3	5.1		9	5.3	
Missing	1	1.1		0	0.0		1	0.6	
	n	**Mean**	***SD***	***n***	**Mean**	***SD***	***n***	**Mean**	***SD***
Outcomes									
K6 (0–24)	94	4.4	4.7	58	4.3	4.4	169	3.9	4.3
Burnout: Emotional exhaustion (5–25)	95	14.0	4.6	57	15.5	5.0	171	14.5	4.6
Depersonalization (6–30)	95	11.4	3.8	57	12.2	4.9	170	11.8	4.1
Personal accomplishment (6–30)	95	16.7	4.0	57	16.5	4.0	171	15.4	4.4
Job satisfaction (0–100)	94	62.6	24.6	58	53.4	24.2	171	59.2	24.3
Quality of nursing care (0–100)	94	59.3	19.7	58	54.0	20.2	170	55.9	19.4
	n	**%**		***n***	**%**		***n***	**%**	
Self-reported health status									
Healthy or moderately healthy	71	74.7		44	74.6		124	72.5	
Neither	12	12.6		7	11.9		19	11.1	
Not very healthy	10	10.5		5	8.5		23	13.5	
Not healthy	2	2.1		2	3.4		4	2.3	
Missing	0	0.0		1	1.7		1	0.6	
Self-reported accumulated fatigue									
I don't feel tired	1	1.1		0	0.0		4	2.3	
I feel tired but I am recovering the next day	38	40.0		11	18.6		60	35.1	
I often get tired after the next day	43	45.3		35	59.3		70	40.9	
I'm always tired, even on holidays	13	13.7		12	20.3		36	21.1	
Missing	0	0.0		1	1.7		1	0.6	
Intent to leave									
Will remain	57	60.0		35	59.3		86	50.3	
May remain	18	19.0		21	35.6		73	42.7	
May leave	2	2.1		2	3.4		8	4.7	
Will leave	3	3.2		0	0.0		3	1.8	
Missing	15	15.8		1	1.7		1	0.6	
Resigned from employment									
No	78	82.1		56	94.9		150	87.7	
Yes	2	2.1		1	1.7		8	4.7	
Missing	15	15.8		2	3.4		13	7.6	

CICS, Chiba Interdisciplinary Competency Scale; CVF, Competing Values Framework; K6, six items from the Kessler Psychological Distress Scale; PES-NWI, practice environment scale of the nursing work index.

[a]The hospitals in Group 1 enrolled in the study in 2013 (Phases 1 and 2), and the hospitals in Group 2 enrolled in 2014 (only Phase 2).

[b]Other: diploma/associate degree, graduated from nursing school or 3-year junior college.

[c]$1 (US) = 110 yen as of May 2019.

TABLE 3 Summarized data set of chief nursing officers in groups 1 and 2 in phases 1 and 2

	Group 1[a] (7 hospitals)						Group 2[a] (16 hospitals)		
	Phase 1, 2013			Phase 2, 2014			Phase 2, 2014		
	$n = 7$			$n = 7$			$n = 16$		
	n	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*
Socio-demographic status									
Age (years)	7	58.4	3.5	7	56.1	2.7	16	55.3	3.7
Years worked as a nurse	7	32.4	11.8	6	34.9	2.6	14	30.8	9.5
	n	%		*n*	%		*n*	%	
Sex									
Female	7	100.0		7	100.0		16	100.0	
Education									
Bachelor's degree	1	14.3		1	14.3		0	0.0	
Master's degree (graduate school)	1	14.3		3	42.9		5	31.3	
Other[b]	5	71.4		3	42.9		10	62.5	
Missing	0	0.0		0	0.0		1	6.3	
Marital status									
Married	3	42.9		3	42.9		12	75.0	
Unmarried/widowed/divorce	4	57.1		4	57.1		4	25.0	
Individual annual income[c] (×10,000 yen)									
≤500	0	0.0		0	0.0		0	0.0	
501–800	0	0.0		2	28.6		8	50.0	
≥801	7	100.0		5	71.4		8	50.0	
Household annual income[c] (×10,000 yen) (excluding own income)									
None	3	42.9		4	57.1		3	18.8	
≤500	2	28.6		1	14.3		4	25.0	
≥501	2	28.6		2	28.6		9	56.3	
	n	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*
Organizational work environment									
Empowerment (composite) (0–7)	7	5.6	0.9	7	5.4	0.5	15	5.6	0.7
CVF (1–5): Clan	7	2.2	0.4	7	2.5	0.3	16	2.6	0.7
Adhocracy	7	2.6	0.6	7	2.8	0.5	16	2.9	0.5
Hierarchy	7	2.4	0.4	7	2.4	0.4	16	2.4	0.5
Market	7	2.9	0.3	7	2.5	0.4	16	3.1	0.4
	n	%		*n*	%		*n*	%	
Bullying experience in previous 6 months									
No	7	100.0		7	100.0		16	100.0	
	n	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*
Outcomes									
K6 (0–24)	7	1.7	1.7	7	3.6	3.0	16	2.1	2.2
Burnout: Emotional exhaustion (5–25)	7	10.1	3.1	7	10.3	3.0	16	10.1	3.3
Depersonalization (6–30)	7	7.4	1.0	7	8.9	1.1	16	9.3	2.5
Personal accomplishment (6–30)	7	17.9	4.1	7	17.9	3.2	16	17.9	3.7

(Continues)

TABLE 3 (Continued)

	n	Mean	*SD*	*n*	Mean	*SD*	*n*	Mean	*SD*
Job satisfaction (0–100)	7	81.1	13.5	7	66.9	23.9	16	71.4	20.9
Quality of nursing care (0–100)	7	71.9	13.4	7	59.1	21.0	16	62.7	18.0
	n	**%**		***n***	**%**		***n***	**%**	
Self-reported health status									
Healthy or moderately healthy	7	100.0		6	85.7		13	81.3	
Neither	0	0.0		1	14.3		1	6.3	
Not very healthy	0	0.0		0	0.0		2	12.5	
Not healthy	0	0.0		0	0.0		0	0.0	
Self-reported accumulated fatigue									
I don't feel tired	0	0.0		0	0.0		0	0.0	
I feel tired but I am recovering the next day	5	71.4		6	85.7		12	75.0	
I often get tired after the next day	2	28.6		1	14.3		3	18.8	
I'm always tired, even on holidays	0	0.0		0	0.0		1	6.3	
Intent to leave									
Will remain	4	57.1		4	57.1		9	56.3	
May remain	0	0.0		3	42.9		5	31.3	
May leave	1	14.3		0	0.0		2	12.5	
Will leave	2	28.6		0	0.0		0	0.0	
Resigned from employment									
No	7	100.0		7	100.0		7	100.0	

CVF: Competing Values Framework; K6: six items from the Kessler Psychological Distress Scale.

[a]The hospitals in Group 1 enrolled in the study in 2013 (Phases 1 and 2), and the hospitals in Group 2 enrolled in 2014 (only Phase 2).

[b]Other: diploma/associate degree, graduated from nursing school or 3-year junior college.

[c]$1 (US) = 110 yen as of May 2019.

TABLE 4 Correlation between PES-NWI Scores and Nurse Outcomes by the Mean per Unit

	Nurse outcomes			
Work environment	**Job satisfaction**	**Quality of nursing care**	**Self-reported health status[b]**	**Self-reported accumulated fatigue[b]**
PES-NWI subscales				
Nurse participation in hospital affairs	0.441	0.412	0.153	−0.170
	<0.0001	*<0.0001*	*0.009*	*0.0036*
Nursing foundations for quality of care	0.489	0.570	0.212	−0.161
	<0.0001	*<0.0001*	*0.0003*	*0.0059*
Nurse manager ability, leadership and support of nurses	0.526	0.432	0.220	−0.211
	<0.0001	*<0.0001*	*0.0001*	*0.0003*
Staffing and resource adequacy	0.440	0.378	0.304	−0.289
	<0.0001	*<0.0001*	*<0.0001*	*<0.0001*
Collegial nurse–physician relations	0.296	0.340	0.145	−0.063
	<0.0001	*<0.0001*	*0.0132*	*0.2863*
PES-NWI Composite	0.594	0.556	0.279	−0.256
	<0.0001	*<0.0001*	*<0.0001*	*<0.0001*

Note: $N = 230$[a].

Upper row: Spearman's rank correlation coefficient; *Italics row*: *p*-value. Data of 2,366 staff nurses working at 230 units were analysed.

[a]Listwise deletion: Excludes units with <3 respondents.

[b]Reversed the order of choices to show that higher scores mean better outcomes.

a declining labour force is a consequence of the declining birth rate and ageing in Japan, securing a future work force in nursing, as in other labour markets, is an urgent issue. Responses to this situation should include increasing the number of workers in the current and future nursing labour markets and improving productivity in each workplace. Making workplaces more attractive to nurses should increase or at least maintain the size of the nursing workforce. Because a final goal of the WENS-J is to identify the workplace characteristics that attract nurses or improve their health status, future studies using WENS-J data should provide new insights into nursing science and management. Furthermore, the results will have important implications about health policy to secure human resources in nursing. The characteristics of the workplace environment are also important motivators for nurses to realize higher performance as professionals and provide optimal patient outcomes or quality of care (American Association of Critical-Care Nurses, 2016).

WENS-J has features that will help future studies based on its data to achieve their goals effectively. First, WENS-J is a unique cohort study of a relatively large sample of nurses in Japan, while other cohort studies of Japanese nurses, such as the Japan Nurses' Health Study (Hayashi et al., 2007), have focused on nurses' health rather than their workplace environment. Second, WENS-J measured as outcomes resignation from hospitals as well as nurses' intention to leave. Third, the participants included not only staff nurses, but also NMs and CNOs, whereas many studies of nurses' workplace environment have focused on either staff nurses or NMs, but not both. Fourth, because established measurements of work environment (e.g. the PES-NWI) were used as indicators of the organizational work environment, international comparisons could be made between future and past WENS-J studies. Finally, because the WENS-J included items that measure a defined concept, "followership," a future study based on WENS-J data will be able to develop a new instrument to measure this construct.

5.2 | Limitations and future research

This study has several limitations. First, it did not include small hospitals. To avoid the influence of differences in management style based on hospital size, only hospitals with more than 200 beds were asked to participate. Second, only large-city hospitals were invited, because they were assumed to be in a more competitive situation in the nursing labour market than hospitals in more rural areas. Therefore, there is a possibility that only more motivated and/or well-organized hospitals participated in this study. Third, the response rates of nurses in this survey were not high (30.7% in 2013, 40.4% in 2014), because participation was completely voluntary. Nurse participants mailed their answers to researchers directly without intermediation by their hospitals. Finally, patient outcomes were not included in this study, although realization of a healthy work environment should facilitate optimal patient outcomes. Future studies need to focus on patients' outcomes in addition to those of nurses.

6 | CONCLUSION

This study has reported descriptive statistics from 2013–2015 about Japanese nurses' organizational work environments, focusing on human relations and their outcomes not only for staff nurses, but also for NMs and CNOs, with relatively large samples. Statistically significant relationships between work environment and nurse outcomes for staff nurses were confirmed at the unit level. Further detailed analysis for each variable, to clarify relationships between healthy work environment and nurse outcomes shown in Figure 2, will be reported from the WENS-J project team in the future.

7 | IMPLICATIONS FOR NURSING MANAGEMENT

The results of this study provide baseline data on various characteristics of nurses' workplace environments and nurse outcomes among middle-sized hospitals in Japan. This study will allow future investigations using the data to identify causal relationships between hospitals' characteristics and nurse outcomes. The results should provide important information for nurse administrators or NMs as they develop effective strategies to create a healthy work environment for nurses and achieve optimal outcomes for patients and nurses alike.

This study's descriptive statistics also show differences in work environment and nurse outcomes between staff nurses and nurses in managerial positions. For instance, not only mental but also physical self-reported health status was worse among staff nurses than NMs and CNOs. Nurse in managerial positions, such as NMs and CNOs, need to focus on these differences and provide means for nurses to realize a healthy work environment through an effective managerial approach.

Furthermore, NMs might need to improve specific aspects of their work environment based on the outcome that they wish to improve, although betterment of the work environment overall might result in improvement of nursing outcomes.

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CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

AUTHOR CONTRIBUTIONS

YO, KS, YK, NM, KT, YY, ST, MN, KK, YMI, KK and the WENS-J project team: Study design and questionnaire development; study implementation. YO, KS, YK, NM and KT: Manuscript drafting. All authors, including the WENS-J project team, revised and approved the final manuscript. YO is the principal researcher of the study.

ETHICAL APPROVAL

Medical Research Ethics Committee of Tokyo Medical and Dental University. Ethical Board approval number: 1674 and M2018-065.

DATA AVAILABILITY STATEMENT

Because participants of this study were told that their data would not be shared publicly, supporting data are not available.

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APPENDIX 1

VARIABLES AND MEASUREMENT SCALE

Variables		Measurement scale or question	Range	Reliability and validity
Demographic status/socioeconomic status		Age, sex, years worked as a nurse, highest educational background in nursing, marital status, annual income, etc.	–	–
Organizational work environment factors	Practice environment	PES-NWI consists of five subscales: nurse participation in hospital affairs; nursing foundations for quality of care; nurse manager ability, leadership and support of nurses; staffing and resource adequacy; and collegial nurse–physician relations. Respondents are asked to indicate the extent to which they agree that the item is present in their current job.	Range of subscales and composite: 1–4. Subscale scores were calculated as the mean of items included in the subscale after the numbers were reversed: "strongly agree (=4)," "agree (=3)," "disagree (=2)," and "strongly disagree (=1)." The composite score was calculated as the mean of the 5 subscale scores.	Acceptable reliability and validity were shown (Ogata et al., 2018).
	Followership	Fourteen items based on ideas of followership were newly established (Chaleff, 2009; Kellerman, 2008; Kelly, 1992).	The response set of each scale ranges from "rarely (=1)" to "almost always (=5)." (In this study, the sum of 14 items' response sets was calculated as the total score. Range: 14–70.)	Reliability and validity were tested (Nagai et al., 2016; Fujinami et al., 2016). Cronbach's α of the 13 items was more than 0.90. It was developed in Japanese.
	Competencies of interprofessional practice	The Chiba Interdisciplinary Competency Scale (CICS) has 6 subscales: Attitudes and beliefs as a professional; Team management skills; Actions for accomplishing team goals; Providing care that respects patients; Attitudes and behaviours that improve team cohesion; and Fulfilling one's role as a professional.	Range: 29–145. The total score for all 29 scales was calculated. Each scale ranges from "Disagree (=1)" to "Agree (=5)" on a 5-point Likert scale. Higher scores imply higher competency of interprofessional collaborative practice.	Reliability and validity were confirmed (Sakai et al., 2017).
	Organizational culture	Competing Values Framework (CVF). Subscales: clan; adhocracy; hierarchy; and market.	Each of the 4 dimensions ranges from "Strongly disagree (=1)" to "Strongly agree (=5)" on a 5-point Likert scale. The mean score across the 4 scales was calculated.	Reliability and validity of the original version of CVF (Quinn et al., 1991; Helfrich et al., 2007) were confirmed. Although some Japanese studies have translated and used this scale (e.g., Sasaki et al., 2017), reliability and validity of the Japanese version are not well examined yet.
	Bullying	An item of the Negative Acts Questionnaire Revised (Einarsen et al., 2009; Tsuno et al., 2010) was used to capture self-labelled bullying experience. Question: "Have you been bullied at your current hospital during the past 6 months?"	The response set ranges from "none (=1)" to "almost every day (=5)" on a 5-point Likert scale.	The Japanese version of Negative Acts Questionnaire Revised (Tsuno et al., 2010) had acceptable reliability and validity.

(Continues)

APPENDIX 1 (Continued)

Variables		Measurement scale or question	Range	Reliability and validity
Nurse Outcomes	Self-reported health status[a]	To determine nurses' overall health status, a single item to assess self-rated health condition in the past 30 days was included.	Ranges from "healthy (=1)" to "not healthy (=5)" on a 5-point Likert scale.	This is an original item for this study.
	Accumulated fatigue[a]	To asses nurses' accumulated fatigue, a single item of self-rated accumulated fatigue in the past 30 days was included.	Ranges from "I don't feel tired (=1)" to "I'm always tired, even on holidays (=4)" on a 4-point Likert scale.	This is an original item for this study.
	Psychological distress[a]	Six items from the Kessler Psychological Distress Scale (K6) were included to measure psychological distress in the past 30 days (e.g., feeling so sad that nothing can cheer you up).	Range: 0–24. The total of 6 items was used as the K6 score. The response set ranges from "all of the time (=4)" to "none of the time (=0)" on a 5-point Likert scale. Higher scores mean higher levels of psychological distress.	K6 in Japanese has acceptable reliability and validity (Furukawa et al., 2007).
	Burnout[a]	The Japanese Burnout Scale (JBS). The subscales were the same as those of the Maslach Burnout Inventory: emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA).	Ranges: 5–25 for EE; 6–30 for DP; and 6–30 for PA. Response set ranges from "never (=1)" to "always (=5)" on a 5-point Likert scale.	Reliability and validity of the JBS were confirmed by Kubo et al. (1992).
	Job satisfaction[a]	Vertical 100-mm visual analogue scale (VAS)	Range: from "not satisfactory (=0)" to "satisfactory (=100)."	This is an original item.
	Psychological Empowerment[b]	Subscales of the Psychological Empowerment Instrument: meaning; competence; self-determination; and impact.	Range of each subscale: 3–21. The mean scores for all 12 scales were calculated. Each scale ranges from "very strongly disagree (=1)" to "very strongly agree (=7) on a 7-point Likert scale.	Reliability and validity were confirmed (Katsuyama, 2000).
	Intent to leave[b]	Question: "Will you leave your current hospital within the next year or not?"	Range: from "will remain (=1)" to "will leave (=4)" (4-point response set).	This is an original item.
	Resignation[b]	Whether the participants had resigned from the hospital or not. Directors of Nursing were asked the IDs of nurses who had resigned from the current hospital at the end of fiscal year.	Yes (resign) or No (continue to work).	N/A–Exact action done by staff nurses, nurse managers and CNOs.
	Quality of nursing care[b]	Vertical 100-mm VAS	Range: from "not high quality (=0)" to "high quality (=100)."	This is an original item.

Abbreviations: CICS, Chiba Interdisciplinary Competency Scale; CVF, Competing Values Framework; JBS, Japanese Burnout Scale; DP, depersonalization; EE, emotionalexhaustion; PA, personal accomplishment; K6, Kessler Psychological Distress Scale; PES-NWI, Practice Environment Scale of the Nursing Work Index; VAS, visual analogue scale.[a] Health and satisfaction outcomes.[b] Performance-related outcomes.

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