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Resident encounters with disruptive workplace behaviours in Japan: findings from a national cross-sectional study

Takashi Watari ,[1] Virginia Sheffield,[2] Ashwin Gupta ,[3,4] Kaori Taniguchi,[5] Yasuharu Tokuda,[6] Yuji Nishizaki[7]

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For numbered affiliations see end of article.

Correspondence to
Dr Takashi Watari;
wataritari@gmail.com

ABSTRACT

Importance Disruptive workplace behaviours (DWBs) between healthcare professionals compromise patient care quality and organisational culture, impacting staff morale, communication and teamwork. Residents are particularly vulnerable to it from nurses and supervisors.

Objective Elucidate factors associated with DWBs experienced by residents.

Design Nationwide cross-sectional study using a web-based survey.

Setting Japanese postgraduate clinical training hospitals.

Participants First- and second-year postgraduate residents were surveyed between 15 and 31 January 2023, immediately after participating in the nationally administered computer-based residency exam.

Exposure None.

Main outcomes and measures Primary outcomes include previously published eight types of DWBs experienced by residents. Resident characteristics at the time of the study were used. Hospital data (location of the training hospital, number of beds, number of emergency transports, average length of hospital stays, number of outpatients per day and the actual number of residents, full-time physicians and nurses) were obtained from Japan's largest hospital information database.

Results Of 5403 residents analysed, 68.3% were males, and 84.9% were under 28 years of age. Residents reported encountering DWBs from physicians and nurses approximately 35% of the time, a roughly equivalent percentage from both groups. After multivariate logistic regression analysis, the likelihood of encountering DWBs from nurses increased with hospital size (>700 beds; adjusted OR (aOR) 2.19; 501–700 beds; aOR 1.45 and 301–500 beds; aOR 1.26, all statistically significant). Furthermore, DWBs from nurses were significantly more prevalent in settings with higher admissions per nurse (aOR 1.70). DWBs from physicians were significantly more prevalent towards male (vs female) residents (aOR 1.60) and less likely among the second-year postgraduate (vs first-year postgraduate) residents (aOR 0.87).

Conclusions DWBs from nurses are significantly more common with increasing hospital bed numbers and increase with the number of admissions per nurse. No such correlation was observed with DWBs from physicians. Male residents experience more DWBs than female residents.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Disruptive workplace behaviours (DWBs) occurring between healthcare professionals compromise patient care quality and safety. The factors associated with DWBs experienced by residents are unknown.

WHAT THIS STUDY ADDS

⇒ Nurse-initiated DWB towards residents was positively correlated with hospital bed capacity and the number of admissions per nurse each shift. Male residents were significantly more likely than female residents to encounter DWBs.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Cultivating a stronger safety culture not only among physicians but also among nurses and supervisors involved in resident training is necessary.

INTRODUCTION

The persistent issue of disruptive workplace behaviour (DWB) among healthcare providers demands immediate attention to foster a safe and supportive environment for patient care and education.[1] DWBs have far-reaching repercussions, impacting not only the quality of patient care but also the work environment, compromising patient safety and undermining the overall effectiveness of healthcare organisations.[1–4] DWBs can be categorised according to severity, ranging from overtly aggressive behaviours, such as shouting and physical violence, to subtler negative behaviours, such as exclusion from patient-related discussions.[5 6] The broad and ambiguous nature of defining DWB has resulted in significant variability in quantitative assessments[7–9]; nevertheless, studies of DWB have consistently revealed that such behaviours expose patients to the avoidable risk and, in extreme cases, can lead to fatal outcomes.[1 10] Furthermore, DWB among healthcare professionals undermines safety culture, diminishing staff morale, communication quality, teamwork, trust, mutual respect and overall organisational health.[7 8 11 12] Medical professionals in positions of power may exhibit DWBs,[5 13] and medical trainees

have been uniquely impacted by these behaviours, eight particularly from nurses and supervising physicians.[5 8 13] Evidence shows that DWB is a clear source of stress for resident trainees and may lead to burnout, decreased training satisfaction and even suicidal thoughts.[14 15] Despite the importance of patient safety and postgraduate clinical education, there remains a limited understanding of the factors related to DWB experienced by residents.[5 13 16]

Studies conducted in the USA have found that women disproportionately endure discrimination, harassment and other forms of DWB.[14] Conversely, a preliminary report from Japan found that male residents encounter higher rates of DWB, including physical violence.[16] Similar to the USA, the study from Japan also noted that female residents are more often subjected to workplace sexual harassment.[13–16] These findings imply notable differences across countries and cultures. Some surveys on safety culture portray better cultures in academic centres, such as universities and large public hospitals[17 18]; however, a nationwide survey on safety culture conducted among residents in Japan revealed that those trained at university hospitals perceived a lower safety culture.[19] This finding suggests that variations in country-specific factors, healthcare systems and sociocultural contexts may contribute to these differences.[19] To promote systematic change towards a culture of safety, it is imperative to first elucidate the types of DWBs and the personal and environmental factors associated with DWBs most commonly encountered by residents. Due to the worse safety cultures at academic centres in Japan,[19] further research is warranted to determine if the incidence of DWB differs based on hospital characteristics, such as hospital size and type (eg, university vs community) or staffing characteristics. We hypothesised that the nature and frequency of physician- and nurse-initiated DWBs may differ depending on the number of hospital beds and hospital types (university vs city hospitals). This study aimed to assess the prevalence of DWBs among residents and to identify the factors associated with DWBs, at both the resident level and the institution level.

METHODS

Study participants and hospital data

This was a national cross-sectional survey conducted using a web-based questionnaire. Our study follows Strengthening the Reporting of Observational Studies in Epidemiology guidelines to ensure the accurate and transparent reporting of observational research. This represents a secondary analysis that combines data reported as descriptive statistics in a short report and additional nationwide information on training hospitals.[16] Initially, a baseline survey of resident DWB experiences was conducted from 15 to 31 January 2023. The study included first- and second-year postgraduate residents who had recently completed the General Medicine Intermittent Examination, a nationally administered computer-based examination for residents in Japan.[16] Of 8438 examinees, 1594 withdrew before being included in the survey, 781 did not provide consent and 660 did not participate (online supplemental file 1, Participant Flow Diagram). Information on resident's experiences with DWB victimisation was obtained through the survey. Referring to previous US studies,[5] we developed multiple-choice response options for each of the eight types of DWBs, tailored to the Japanese sociocultural context and assessed whether the residents had experienced a DWB within the past year based on their academic year (online supplemental file 2, Survey Content). Although we were unable to perform detailed psychometric validation, we implemented a bilingual translation and back-translation process to ensure the accuracy and consistency of the questionnaire items. We subsequently accessed data from the 'Iryo–Kaigo–Jyouhou–Kyoku' Healthcare Market Analysis Platform, Japan's most extensive hospital information database.[20] We included detailed information about the hospitals with which the residents were associated, including hospital location, bed capacity, the volume of emergency room visits, average length of patient stay, daily outpatient numbers and number of residents, full-time physicians and full-time nurses from the database.[20]

Training environment of medical resident in Japan

In the Japanese training system, residents must undergo 2 years of obligatory rotational training following 6 years of medical school prior to embarking on a 24-month specialised programme. These seven rotational training programmes include internal medicine, surgery, rural community medicine, obstetrics and gynaecology, paediatrics, psychiatry, anaesthesiology and several elective programmes.[21] The initial 2 years of training serve as a period for residents to determine their future specialties. Subsequently, students typically focus on one of the 19 major specialties in the third year following graduation. Importantly, specialty selection is not competitive in Japan. Consequently, most residents proceed with subsequent training based on their medical interests.[22]

Statistical analysis methods

We performed standard descriptive statistics using the χ^2 test for categorical variables. Parametric tests, such as the t-test and analysis of variance (ANOVA), were applied for variables with normal distributions, while non-parametric tests were used for skewed distributions, based on the results of the Shapiro–Wilk test. Multivariate logistic regression analysis was performed to adjust for DWBs as the dependent variable. Personal factors (gender, age and postgraduate year (PGY-1 or 2)) and environmental factors, such as the number of beds (categorised as small: ≤300, medium: 301–500, large: 501–700 and largest: ≥701), type of hospital operation (community hospital, main university hospital and university branch hospital), urban setting, number of residents in the hospital, total number of physicians in the hospital, total number of nurses, average patient length of stay, annual ambulance

transport volume, average daily outpatient visits and other background factors, were included. A sensitivity analysis was conducted by excluding certain variables from the multivariate logistic regression model. All analyses were performed using Stata SE version 17.0 (StataCorp, College Station, TX, USA). Statistical significance was set at a two-tailed p value of<0.05. This study was approved by an Ethical Review Committee.

RESULTS

Of 5403 residents included in the analysis, 3688 (68.26%) were males, 2641 (48.8%) were in their PGY-2 years and 84.9% were less than 28 years old. Hospitals to which the residents were affiliated included community hospitals (4488 (83.1%)), university hospitals (555 (10.3%)) and university branch hospitals (360 (6.7%)). Hospital sizes defined by the number of beds were as follows: small (506 (9.4%)), medium (2157 (39.9%)), large (1668 (30.9%)) and largest (1072 (19.8%)). Of all hospitals, 1722 (31.9%) were located in urban areas.

The individual resident-level and training hospital characteristics were stratified by bed size (table 1). The number of residents, physicians, nurses, ambulance transports and average daily inpatient and outpatient encounters were positively correlated with the number of hospital beds. The average length of hospital stay was highest in small hospitals (13.8 days, IQR 12.4–15.9) and lowest in large hospitals (11.9 days, IQR 11.0–13.0).

Table 2 shows the incidence of physician- and nurse-initiated DWB encountered by residents based on hospital size. Generally, encounters with physician-initiated DWB were significantly more prevalent in the largest hospitals (39.0%); however, when assessed individually, only the proportion of residents reporting being 'excluded from the discussion' was associated with hospital size. The proportion of DWB encounters involving nurses increased with hospital size, with the most substantial difference observed between small (26.5%) and large hospitals (46.2%) (p<0.001). When perpetrated by nurses, encounters with DWB, such as being looked down on, 'yelled at loudly' and 'persistently scolded', correlated with hospital size.

Table 3 displays the comparative data on experiences with DWB perpetuated by physicians and nurses, adjusted using a multivariate logistic regression analysis. Being male residents increased the likelihood of encountering DWB from physicians (adjusted OR (aOR) 1.601, 95% CI 1.411 to 1.817, p<0.001) and nurses (aOR 1.171, 95% CI 1.035 to 1.325, p=0.012). Additionally, encounters with DWB from physicians were more likely to increase with the age of the resident (aOR 1.063, 95% CI 1.024 to 1.103, p<0.001; for each one-unit increase in age, the odds increase by 6.3%) and second-year residents were less likely to experience physician perpetuated DWB than first-year residents (aOR 0.874, 95% CI 0.776 to 0.984, p=0.027). There were no differences observed in the likelihood of physician-perpetuated DWB in relation to other personal factors. However, for DWB encountered by nurses, the likelihood (aOR) tended to increase with hospital size (aOR 1.264 for medium, aOR 1.447 for large and 2.192 for the largest hospitals as compared with small hospitals), even after adjusting for the number of residents, the number of full-time physicians, full-time nurses and labour-related factors, such as the number of patients and average length of hospital stay. A higher number of admissions per nurse was significantly associated with DWB encounters (aOR 1.703, 95% CI 1.126 to 2.575, p=0.012; for each one-unit increase in the average number of inpatients per nurse, the odds increase by 70.3%).

Finally, table 4 shows the results for the eight individual types of DWB experienced by physicians and nurses, adjusted using multivariate analysis. Being male was the most significant factor associated with most types of DWB encounters perpetuated by physicians with the exception of gender discrimination where being male significantly reduced the likelihood of DWB encounters (aOR 0.237, Z=−7.330, p<0.001) and 'verbal abuse' where university branch hospital was the most significant variable. Increasing resident age, urban area, number of patients per physician, average length of hospital stay and number of transportation per physician were also significantly associated with increased likelihood of DWB encounters of various types. In particular, the odds of experiencing the DWB of being 'looked down on' or 'yelled at loudly' increased with increasing resident age (aOR 1.054, Z=2.240, p=0.025 and aOR 1.077, Z=2.980, p=0.003, respectively). Conversely, the odds of encountering being 'looked down on' decreased for second-year residents (aOR 0.845, Z=−2.220, p=0.026). Verbal abuse was more common in university branch hospitals (aOR 3.194, Z=3.180, p=0.001) as well as main university hospitals (aOR 2.805, Z=2.640, p=0.008), and was associated with a higher number of ambulance transports per a physician (aOR 1.032, Z=3.520, p<0.001).

The associated factors for the experience of DWB perpetuated by nurses differed in characteristics from those of DWB perpetuated by physicians. For 'looked down on', hospital size and number of admissions per nurse were the major associated factors (aOR 1.881, Z=3.500, p<0.001 and aOR 1.590, Z=2.030, p<0.001, respectively). Regarding gender discrimination, being a male resident significantly reduced the experience of DWB (aOR 0.341, Z=−4.890, p<0.001), while it was significantly increased in university hospital branches (aOR 2.853, Z=2.650, p=0.008). On the other hand, most DWB items were most significantly associated with an increase in the number of admissions per nurse. Regarding physical violence, the male sex was also significantly associated with DWB encounters from nurses (aOR 2.683, Z=2.030, p=0.043). Finally, sensitivity analysis was performed to assess the robustness of the primary findings. These analyses involved sequential inclusion and exclusion of potential confounders and adjustment factors in our multivariate models. Despite these variations, the core

Table 1 Characteristics of residents' individual backgrounds and training hospitals by hospital size

		<300 (Small)	301–500 (Medium)	501–700 (Large)	>700 (Largest)	
		N=506	N=2157	N=1668	N=1072	P value
Sex (Men)		370 (73.1%)	1469 (68.1%)	1136 (68.1%)	713 (66.5%)	0.069
Age	24	15 (3.0%)	73 (3.4%)	52 (3.1%)	33 (3.1%)	**<0.001**
	25	83 (16.4%)	422 (19.6%)	371 (22.2%)	197 (18.4%)	
	26	139 (27.5%)	688 (31.9%)	533 (32.0%)	330 (30.8%)	
	27	100 (19.8%)	435 (20.2%)	369 (22.1%)	230 (21.5%)	
	28	42 (8.3%)	202 (9.4%)	158 (9.5%)	113 (10.5%)	
	29	31 (6.1%)	97 (4.5%)	54 (3.2%)	58 (5.4%)	
	30 ≧	96 (19.0%)	240 (11.1%)	131 (7.9%)	111 (10.4%)	
PGY-2		240 (47.4%)	1012 (46.9%)	839 (50.3%)	550 (51.3%)	
Hospital type	Community hospital	491 (97.0%)	2060 (95.5%)	1415 (84.8%)	522 (48.7%)	**<0.001**
	University hospital	0 (0.0%)	6 (0.3%)	127 (7.6%)	422 (39.4%)	
	University branch hospital	15 (3.0%)	91 (4.2%)	126 (7.6%)	128 (11.9%)	
Located urban city		128 (25.3%)	619 (28.7%)	605 (36.3%)	370 (34.5%)	**<0.001**
Maximum allowed resident numbers (IQR)		4 (3–6)	8 (6–10)	12 (11–17)	32 (19–45)	**<0.001**
Number of residents in the programme (IQR)		3.5 (2–5)	7 (5–10)	12 (10–16)	29 (16–40)	**<0.001**
Residency match rate (IQR)		100 (75–100)	100 (87.5–100)	100 (100–100)	93.2 (89.7–100)	**<0.001**
Number of physicians		54.9 (44.3–68.6)	106.3 (79.5–139)	182.4 (148–219.8)	417.2 (289–483.9)	**<0.001**
Number of nurses		234.1 (193.2–256)	384 (317–459)	609.9 (522–662.8)	894 (795.9–997)	**<0.001**
Number of ambulance transports		812 (579–1089)	1483 (996–1961)	2155 (1603–2543)	2282 (1772–2726)	**<0.001**
Average length of hospital stay		13.8 (12.4–15.9)	12.2 (10.8–14)	11.9 (11–13)	12.3 (11–13)	**<0.001**
Average number of inpatients per day		199.5 (167.3–225.8)	297.7 (259–337.5)	441.4 (388–485.5)	676.1 (604–724.3)	**<0.001**
Average number of outpatients per day		417 (275.9–563)	669.1 (482.6–816.9)	1022.6 (902–1187.6)	1791.1 (1473–2065.5)	**<0.001**

Bold type indicates statistical significance.
Physicians include any attending staff, faculty staff, fellows and senior fellows.
PGY, postgraduate year.

significant results (sex, hospital size, age, PGY-2 and university hospital for gender harassment) remained unchanged.

DISCUSSION

This study is a secondary analysis combining data from a nationwide survey of 5403 medical residents in Japan, which was analysed in conjunction with the characteristics of their training hospitals. Approximately, 35% of these residents reported experiencing some form of DWB perpetuated by physicians or nurses over a 1-year period. In an initial report assessing gender-based differences, we found that, in Japan, male residents were more frequently subjected to most types of DWB, while female residents more commonly encountered gender-based discrimination.[16] When controlling for multiple factors related to the training environment, we found a significant correlation between the incidence of nurse-initiated DWB and both the hospital size and the number of hospitalised patients per nurse. However, no such correlation

Table 2 Differences in residents' experiences of disruptive behaviours from physicians and nurses by hospital size

	Total	<300	301–500	501–700	>700	
	N=5403	N=506	N=2157	N=1668	N=1072	P value
By the physicians						
Yes	1888 (34.9%)	179 (35.4%)	735 (34.1%)	556 (33.3%)	418 (39.0%)	**0.016**
Looked down on	950 (17.6%)	84 (16.6%)	385 (17.8%)	271 (16.2%)	210 (19.6%)	0.14
Excluded from the discussion	472 (8.7%)	41 (8.1%)	183 (8.5%)	127 (7.6%)	121 (11.3%)	**0.008**
Yelled at loudly	798 (14.8%)	70 (13.8%)	323 (15.0%)	256 (15.3%)	149 (13.9%)	0.68
Inappropriate jokes	649 (12.0%)	67 (13.2%)	265 (12.3%)	189 (11.3%)	128 (11.9%)	0.66
Persistently scolded	631 (11.7%)	53 (10.5%)	255 (11.8%)	186 (11.2%)	137 (12.8%)	0.48
Gender discrimination	121 (2.2%)	12 (2.4%)	46 (2.1%)	31 (1.9%)	32 (3.0%)	0.26
Verbal abuse	647 (12.0%)	60 (11.9%)	261 (12.1%)	184 (11.0%)	142 (13.2%)	0.38
Physical violence	71 (1.3%)	6 (1.2%)	32 (1.5%)	17 (1.0%)	16 (1.5%)	0.59
By registered nurses						
Yes	1887 (34.9%)	134 (26.5%)	676 (31.3%)	582 (34.9%)	495 (46.2%)	**<0.001**
Looked down on	1422 (26.3%)	102 (20.2%)	511 (23.7%)	430 (25.8%)	379 (35.4%)	**<0.001**
Excluded from the discussion	410 (7.6%)	39 (7.7%)	156 (7.2%)	126 (7.6%)	89 (8.3%)	0.76
Yelled at loudly	300 (5.6%)	20 (4.0%)	88 (4.1%)	101 (6.1%)	91 (8.5%)	**<0.001**
Inappropriate jokes	420 (7.8%)	37 (7.3%)	174 (8.1%)	117 (7.0%)	92 (8.6%)	0.44
Persistently scolded	380 (7.0%)	18 (3.6%)	121 (5.6%)	127 (7.6%)	114 (10.6%)	**<0.001**
Gender discrimination	89 (1.6%)	7 (1.4%)	29 (1.3%)	21 (1.3%)	32 (3.0%)	0.002
Verbal abuse	451 (8.3%)	39 (7.7%)	155 (7.2%)	133 (8.0%)	124 (11.6%)	**<0.001**
Physical violence	35 (0.6%)	4 (0.8%)	11 (0.5%)	10 (0.6%)	10 (0.9%)	0.53

Bold type indicates statistical significance.

was evident among physicians. In this study, we explored factors related to the higher rates of nurse-initiated DWB for residents in larger hospitals.

This cross-sectional study reveals that higher rates of DWB from a nurse in larger hospitals may be linked to the heightened patient care load that nurses experience at these hospitals. To understand the experiences of DWB among residents, it is crucial to account for contextual factors, such as social and cultural influences, as well as individual characteristics of the residents themselves.[6 23 24] Contextual factors include environmental elements, such as professionally segmented hospital systems, hospital safety culture, the prevalence of hierarchies, levels of psychological safety and the weakening of human relationships and interactions.[6 19 24] Regarding individual factors, previous research has identified stress and burnout as major elements contributing to the perpetuation of DWB.[25–27] In larger hospitals, medical complexity, illness severity and increased patient load can all contribute to elevated stress levels for nurses.[11 25 28]

This study accounted for some of these variables, such as patient and staff numbers, emergency transport, the number of patients per physician or nurse and the average length of hospital stay. However, we could not measure variations in patient illness severity. In tertiary hospitals, where there is a high likelihood of treating severely ill patients, factors, such as prolonged working hours, the burden of substantial responsibility and stress, may lead to nurse burnout, indirectly contributing to DWB.[28] Among nurses in larger hospital settings, medical residents frequently experienced disrespect, loud yelling and persistent scolding. However, this study does not clarify the causal effect of hospital size on these nurses' DWBs. The strict hierarchical structure in larger Japanese hospitals could be influential in these findings.[29] In these hospitals, power dynamics favour physicians and senior nurses, leaving residents generally low within this hierarchy and at increased risk for experiencing DWB. Implicit biases may also exacerbate these power dynamics, causing higher ranking medical staff to overshadow their junior counterparts. These administrative and internal organisational barriers can result in frustration and burnout among the medical staff.[29 30]

This study[31] highlights that gender discrimination against female residents is more pronounced in university hospitals than in community hospitals. Universities are charged with spearheading medical research and nurturing future physician leaders, with a focus on diversity being imperative. However, several studies in Japan have consistently revealed substantial barriers hindering the advancement of female physicians into professorial positions over the past 3 decades.[32] Women are underrepresented in academic activities,[31] and none hold positions as presidents or medical directors across Japan's 82

Table 3 Resident encounters characteristics of physician and nurse disruptive behaviours using multivariate logistic analysis

				95% CI		
	aOR	SE	Z	Lower	Upper	P value
Disruptive behaviour by a physician						
Sex (Men)	1.601	0.103	7.290	1.411	1.817	**<0.001**
Age	1.063	0.020	3.180	1.024	1.103	**<0.001**
PGY-2	0.874	0.053	−2.220	0.776	0.984	**0.027**
Hospital beds						
<300	Reference					
301–500	0.932	0.106	−0.620	0.747	1.164	0.536
501–700	0.872	0.123	−0.980	0.662	1.148	0.328
>700	1.030	0.212	0.140	0.687	1.543	0.888
Hospital type						
Community hospital	Reference					
University hospital	0.982	0.138	−0.130	0.745	1.294	0.898
University branch hospital	1.070	0.147	0.500	0.818	1.400	0.619
Located in an urban city	0.890	0.890	0.059	−1.750	0.780	1.014
Number of residents	0.999	0.998	0.005	−0.340	0.989	1.008
Number of nurses in units of 100	1.000	0.000	1.340	1.000	1.001	0.182
Average length of hospital stay	1.013	0.014	0.920	0.986	1.041	0.357
Number of ambulance transports per Dr	1.000	0.000	1.770	1.000	1.000	0.077
Number of hospitalised patients per Dr	1.013	0.046	0.290	0.928	1.107	0.769
Number of outpatients per Dr	0.967	0.014	−2.290	0.940	0.995	**0.022**
Disruptive behaviour by a nurse						
Sex (Men)	1.171	0.074	2.510	1.035	1.325	**0.012**
Age	0.981	0.019	−0.980	0.944	1.019	0.325
PGY-2	1.076	0.066	1.200	0.955	1.212	0.229
Hospital beds						
<300	Reference					
301–500	1.264	0.146	2.030	1.008	1.586	**0.043**
501–700	1.447	0.183	2.930	1.130	1.853	**0.003**
>700	2.192	0.368	4.680	1.578	3.046	**0.000**
Hospital type						
Community hospital	Reference					
University hospital	0.934	0.146	−0.440	0.688	1.267	0.659
University branch hospital	0.999	0.135	−0.010	0.767	1.302	0.995
Located in an urban city	1.072	0.071	1.050	0.942	1.220	0.292
Number of residents	1.005	0.005	1.090	0.996	1.015	0.276
Number of physicians in units of 100	1.000	0.000	−0.060	0.999	1.001	0.952
Average length of hospital stay	0.986	0.013	−1.070	0.960	1.012	0.287
Number of ambulance transports per Ns	0.971	0.020	−1.390	0.932	1.012	0.166
Number of hospitalised patients per Ns	1.703	0.359	2.520	1.126	2.575	**0.012**
Number of outpatients per Ns	0.897	0.049	−2.010	0.806	0.997	0.045

Physicians included attending staff, faculty staff, fellows and senior fellows.
Bold type indicates statistical significance.
Age, each one-unit increase in age.
aOR, adjusted OR; PGY, postgraduate year.

Table 4 Multivariate analysis of eight individual disruptive behaviours: significant results by physicians and nurses

By the physicians	First significant variable			Second significant variable			Third significant variable			Fourth significant variable		
		aOR	Z		aOR	Z		aOR	Z		aOR	Z
Looked down on	Sex (Men)	1.631	5.830	Age	1.054	2.240	PGY-2	0.845	−2.220	Urban	0.827	−2.280
Excluded from the discussion	Sex (Men)	1.807	5.000	Hospitalised Pts/Dr	1.159	2.070	Average stay	1.001	2.310			
Yelled at loudly	Sex (Men)	1.752	6.080	Age	1.077	2.980	Urban	0.821	−2.150			
Inappropriate jokes	Sex (Men)	1.241	2.290									
Persistently scolded	Sex (Men)	1.825	5.820	Urban	0.790	−2.380						
Gender discrimination	Sex (Men)	0.236	−7.340									
Verbal abuse	Univ branch	3.194	3.180	Univ hospital	2.805	2.640	Ambulance transports/Dr	1.032	3.520			
Physical violence	Sex (Men)	2.323	2.630									
By registered nurses												
Looked down on	Largest size	1.881	3.500	Hospitalised Pts/Ns	1.590	2.030	Large size	1.317	2.000	Num. resi.	1.010	2.040
Excluded from the discussion	Hospitalised Pts/Ns	2.481	2.520	Sex (Men)	1.559	3.650	Outpatients/Ns	0.818	−2.150			
Yelled at loudly	Hospitalised Pts/Ns	2.904	2.350	Largest size	2.470	2.650	Sex (Men)	1.336	2.120			
Inappropriate jokes	Hospitalised Pts/Ns	2.275	2.250	Sex (Men)	1.796	4.740	PGY-2	1.344	2.720			
Persistently scolded	Hospitalised Pts/Ns	2.819	2.520	Largest size	2.737	3.040	Large size	2.121	2.720			
Gender discrimination	Sex (Men)	0.341	−4.890	Univ branch	2.853	2.650						
Verbal abuse	Hospitalised Pts/Ns	2.177	2.070	PGY-2	1.278	2.340						
Physical violence	Sex (Men)	2.683	2.030									

Hospitalised Pts/Dr: hospitalised patients per a physician.
Hospitalised Pts/Ns: hospitalised patients per a nurse.
Univ branch: university branch. In Japanese medical context, it indicates a university-affiliated hospital.
Univ hospital: main university hospital, a main university hospital is an academic centre and a hospital affiliated with a university, often serving as a teaching hospital where medical students and residents receive training. Typically, each medical school is associated with one main university hospital.
Ambulance transports/Dr: ambulance transports per a physician.
Outpatients/Ns: outpatients per a nurse.
Num. resi: the total number of medical residents in a particular programme or institution.
aOR, adjusted odds ratio; PGY-2, postgraduate year-2.

university hospitals.[33] Furthermore, women occupy fewer than 7% of board positions across 19 major medical fields in academic societies, with no female presidents among these societies.[34] This trend is especially pronounced in academic settings, suggesting a more entrenched culture at major university hospitals than in city training hospitals.

The study revealed that male residents were more frequently subjected to DWB by both physicians and nurses, with a stronger association observed with DWB perpetuated by physicians. This trend may stem from the predominance of male supervisors who may exhibit harsher or more critical behaviours towards their male trainees.[35] While the specific characteristics of the perpetrators were not ascertainable due to the ethical constraints of the study design, the proportion of male physicians in Japan is notably high, with 71.7% in their 40s, 81.2%

in their 50s and 88.3% in their 60s.[36] In contrast, 91.9% of the nurses in Japan are female.[37] The findings of this study indicate that the first-year Japanese residents are more susceptible to DWB than the second-year residents. This trend can be contextualised with an understanding of pre- and postgraduate medical education in Japan.[38] Japanese pregraduate medical education, spanning 6 years, often lacks substantial practical clinical experience and responsibility for patient care.[39] Consequently, the abrupt transition to the medical field required for postgraduate education and limited knowledge and experience may render first-year residents particularly prone to DWB from their supervising physicians.[5]

Limitation

This study had some limitations. First, recall bias was inevitable because the study duration was over 1 year. It is plausible that many residents may have already forgotten their encounters with DWB, suggesting that the reality of these occurrences might have been more severe than reported. Second, the study design posed challenges in obtaining information regarding the gender and job title of those instigating DWBs. Consequently, we cannot dismiss the possibility that, if one staff member exhibits pronounced disruptive traits, many residents may become victims of this single focal point. Furthermore, studies considering gender differences are likely strongly influenced by cultural backgrounds, training programmes and social contexts, making generalisability to other countries and healthcare systems challenging. Finally, the absence of comprehensive psychometric validation of the survey questions, including factor analysis or reliability testing within the Japanese context, constitutes a limitation. However, we believe that the bilingual translation and back-translation process provided adequate accuracy for this exploratory study. Despite these limitations, the strength of this study lies in its pioneering finding that a larger hospital size and a greater number of hospitalised patients per nurse significantly contribute to the occurrence of nurse-related DWB against residents. Moreover, our study benefits from a relatively high response rate and the representativeness and robustness of the statistical analysis, which lends substantial credibility to these novel insights. Future research endeavours should focus on gathering evidence to improve residency training environments and promote a culture of safety in the coming years.

CONCLUSION

DWBs perpetrated by nurses are more common in larger hospitals and are significantly correlated with the number of admissions per nurse. In contrast, the incidence of DWBs perpetrated by physicians does not show such correlations. This study is the first to report that specific DWBs, such as persistent reprimands from nurses and the overall culture of DWBs, vary according to hospital size. These findings underscore the critical importance of developing targeted interventions to mitigate the effects of DWBs in large hospital settings. Additionally, evaluating the relationship between DWBs and the hospital's safety culture is crucial to strengthening this culture, ultimately fostering a safer environment for learners, healthcare workers and patients. Cultivating a stronger safety culture, not only among physicians but also among nurses and supervisors involved in resident training, is imperative.

Author affiliations
[1]Integrated Clinical Education Center, Kyoto University Hospital, Kyoto, Japan
[2]Department of Internal Medicine, University of Michigan Medical School, Ann Arbor, Michigan, USA
[3]Internal Medicine, VA Ann Arbor Healthcare System, Ann Arbor, Michigan, USA
[4]Internal Medicine, University of Michigan Hospital, Ann Arbor, Michigan, USA
[5]Department of Environmental Medicine and Public Health, Shimane University Faculty of Medicine, Izumo, Japan
[6]Muribushi Okinawa Project for Teaching Hospitals, Urasoe, Japan
[7]Division of Medical Education, Juntendo University School of Medicine Graduate School of Medicine, Bunkyo-ku, Japan

X Takashi Watari @wataritari1

Contributors TW, YN and YT designed the study, the main conceptual ideas and the proof outline. TW, KT, YN and YT collected the data via a web survey on General Medicine In-Training Examination. TW, VS, AG, YN and YT analysed and visualised the data. TW, AG, VS, KT, YN and YT aided in interpreting the results and worked on the article. YT and YN supervised the project. TW wrote the whole article with support from VS and AG. All authors discussed the results and commented on the article. In accordance with the guidelines, we here declare that TW is the guarantor of this article. As the guarantor, TW takes full responsibility for the integrity of the work as a whole, from its inception to the final version submitted for publication.

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ORCID iDs
Takashi Watari http://orcid.org/0000-0002-9322-8455
Ashwin Gupta http://orcid.org/0000-0003-2557-840X

REFERENCES

1 Hicks S, Stavropoulou C. The Effect of Health Care Professional Disruptive Behavior on Patient Care: A Systematic Review. *J Patient Saf* 2022;18:138–43.
2 Moreno-Leal P, Leal-Costa C, Díaz-Agea JL, *et al*. Disruptive Behavior at Hospitals and Factors Associated to Safer Care: A Systematic Review. *Healthcare (Basel)* 2021;10:19.
3 Harolds JA. Quality and Safety in Healthcare, Part LXXIII: Introduction to Disruptive Behavior in Physicians and Other Healthcare Workers. *Clin Nucl Med* 2021;46:989–90.
4 Saxton R, Hines T, Enriquez M. The negative impact of nurse-physician disruptive behavior on patient safety: a review of the literature. *J Patient Saf* 2009;5:180–3.
5 Mullan CP, Shapiro J, McMahon GT. Interns' experiences of disruptive behavior in an academic medical center. *J Grad Med Educ* 2013;5:25–30.
6 Swiggart WH, Dewey CM, Hickson GB, *et al*. A plan for identification, treatment, and remediation of disruptive behaviors in physicians. *Front Health Serv Manage* 2009;25:3–11.
7 Walrath JM, Dang D, Nyberg D. An organizational assessment of disruptive clinician behavior: findings and implications. *J Nurs Care Qual* 2013;28:110–21.
8 Dang D, Nyberg D, Walrath JM, *et al*. Development and validation of the Johns Hopkins Disruptive Clinician Behavior Survey. *Am J Med Qual* 2015;30:470–6.
9 Petrovic MA, Scholl AT. Why We Need a Single Definition of Disruptive Behavior. *Cureus* 2018;10:e2339.
10 Maddineshat M, Rosenstein AH, Akaberi A, *et al*. Disruptive Behaviors in an Emergency Department: the Perspective of Physicians and Nurses. *J Caring Sci* 2016;5:241–9.
11 Walrath JM, Dang D, Nyberg D. Hospital RNs' experiences with disruptive behavior: a qualitative study. *J Nurs Care Qual* 2010;25:105–16.
12 Rosenstein AH, O'Daniel M. A survey of the impact of disruptive behaviors and communication defects on patient safety. *Jt Comm J Qual Patient Saf* 2008;34:464–71.
13 Martins RS, Hashmi SA, Inam H, *et al*. Harassment and mental health in surgical training: a pilot survey of surgical trainees in Pakistan. *J Pak Med Assoc* 2021;71(Suppl 1):S23–8.
14 Hu Y-Y, Ellis RJ, Hewitt DB, *et al*. Discrimination, Abuse, Harassment, and Burnout in Surgical Residency Training. *N Engl J Med* 2019;381:1741–52.
15 Gianakos AL, Freischlag JA, Mercurio AM, *et al*. Bullying, Discrimination, Harassment, Sexual Harassment, and the Fear of Retaliation During Surgical Residency Training: A Systematic Review. *World J Surg* 2022;46:1587–99.
16 Watari T, Sheffield V, Nishizaki Y, *et al*. Differences in the resident encounter of disruptive behavior by gender. *Med Teach* 2024;46:423–5.
17 Yuce TK, Yang AD, Johnson JK, *et al*. Association Between Implementing Comprehensive Learning Collaborative Strategies in a Statewide Collaborative and Changes in Hospital Safety Culture. *JAMA Surg* 2020;155:934–40.
18 Khoshakhlagh AH, Khatooni E, Akbarzadeh I, *et al*. Analysis of affecting factors on patient safety culture in public and private hospitals in Iran. *BMC Health Serv Res* 2019;19:1009.
19 Watari T, Kurihara M, Nishizaki Y, *et al*. Safety culture survey among medical residents in Japan: a nationwide cross-sectional study. *BMJ Open Qual* 2023;12:e002419.
20 Iryo-Kaigo-Jyouhou-Kyokul, homepage of healthcare market analysis platform. Available: https://caremap.jp [Accessed 29 Jun 2024].
21 Watari T, Houchens N, Nishizaki Y, *et al*. Empathy competence and future specialty among medical residents in Japan: a nationwide cross-sectional study. *Sci Rep* 2023;13:13742.
22 Watari T, Nishizaki Y, Houchens N, *et al*. Medical resident's pursuing specialty and differences in clinical proficiency among medical residents in Japan: a nationwide cross-sectional study. *BMC Med Educ* 2023;23:464.
23 Villafranca A, Hamlin C, Enns S, *et al*. Disruptive behaviour in the perioperative setting: a contemporary review. *Can J Anaesth* 2017;64:128–40.
24 Nelson J. The influence of environmental factors in incidents of disruptive behavior. *J Gerontol Nurs* 1995;21:19–24.
25 Rosenstein AH. The Link Between Physician Stress, Burnout, and Disruptive Behaviors. *JMPM* 2023;38:163–6.
26 Rehder KJ, Adair KC, Hadley A, *et al*. Associations Between a New Disruptive Behaviors Scale and Teamwork, Patient Safety, Work-Life Balance, Burnout, and Depression. *Jt Comm J Qual Patient Saf* 2020;46:18–26.
27 Brown SD, Goske MJ, Johnson CM. Beyond substance abuse: stress, burnout, and depression as causes of physician impairment and disruptive behavior. *J Am Coll Radiol* 2009;6:479–85.
28 Grinberg K, Revach C, Lipsman G. Violence in hospitals and burnout among nursing staff. *Int Emerg Nurs* 2022;65:101230.
29 Bagot KL, McInnes E, Mannion R, *et al*. Middle manager responses to hospital co-workers' unprofessional behaviours within the context of a professional accountability culture change program: a qualitative analysis. *BMC Health Serv Res* 2023;23:1012.
30 Bredenberg E, Tietbohl C, Dafoe A, *et al*. Identifying factors that contribute to burnout and resilience among hospital-based addiction medicine providers: A qualitative study. *J Subst Abuse Treat* 2023;144:108924.
31 Nagano N, Watari T, Tamaki Y, *et al*. Japan's Academic Barriers to Gender Equality as Seen in a Comparison of Public and Private Medical Schools: A Cross-Sectional Study. *Womens Health Rep (New Rochelle)* 2022;3:115–23.
32 Kono K, Watari T, Tokuda Y. Assessment of Academic Achievement of Female Physicians in Japan. *JAMA Netw Open* 2020;3:e209957.
33 Watari T, Gupta A, Hayashi M, *et al*. Characteristics of Medical School Deans and University Hospital Directors in Japan. *JAMA Netw Open* 2024;7:e2351526.
34 Watari T, Gupta A, Kataoka H. Representation of Gender and Postgraduate Experience Among Professional Medical Society Boards in Japan. *JAMA Netw Open* 2022;5:e2247548.
35 Bansal AS. Disruptive behaviour amongst doctors, myth or reality? *Jemds* 2014;3:399–406.
36 Ministry of Health. LaW. Government statistics: summary of health administration reports (employed medical personnel) for 2020. 2022.
37 Ministry of Health. LaW. Summary of statistics on physicians, dentists and pharmacists for 2020. 2022.
38 Tokuda Y, Soshi M, Okubo T, *et al*. Postgraduate medical education in Japan: Missed opportunity for learning clinical reasoning. *J Gen Fam Med* 2018;19:152–3.
39 Machi J, Saegusa-Beecroft E, Izutsu S, *et al*. Medical School Hotline: Hawai'i Medical Education Program: An Innovative Method to Incorporate American Education Methodologies into the Traditional Japanese System. *Hawaii J Med Public Health* 2017;76:110–2.