

Table 1. Characteristics of the study

	2013 (n=641)		2019 (n=640)		<i>p</i> -value
	n	%	n	%	
Composition of hospital staff					
physicians	137	21.4	101	15.8	0.567
nurses	280	43.7	341	53.3	
medical staff	91	14.2	122	19.1	
office workers	108	16.8	60	9.4	
others	25	3.9	16	2.5	
total	641	100	640	100	
Gender					
male	199	30.9	176	27.5	0.163
female	442	68.8	464	72.5	
Age					
less than 20	4	0.6	2	0.3	0.124
20- 29	195	30.4	210	32.8	
30-39	180	28.1	191	29.8	
40-49	125	19.5	129	20.2	
50-59	137	21.4	108	16.9	
more than 60	0	0.0	0	0.0	
Working forms					
regular	520	81.1	566	88.4	0.000
non-regular	44	6.9	27	4.2	
others	77	12.0	47	7.3	
Working hours per week					
less than 20 hours	17	2.7	30	4.7	0.003
20 40 hours	168	26.2	196	30.6	
40-60 hours	348	54.3	331	51.7	
60-80 hours	79	12.3	67	10.5	
more than 80 hours	29	4.5	16	2.5	
Opportunity to access to patients					
yes	575	89.7	558	87.2	0.159
no	66	10.3	82	12.8	
Opportunity to provide care to patients					
yes	421	65.7	445	69.5	0.141
no	220	34.3	195	30.5	

Overview of this study

1. The largest number and rate of respondents was nurses in both years (280, 43.7% in 2013 and 341, 53.3% in 2019)
2. The ratio of male to female was approximately 3:7 in both years.
3. The proportion of regular staff was more than 80% in both years.
4. Most of hospital staff worked more than 40 hours per week in both years (71.1% in 2013 and 64.7% in 2019).
5. Naturally, approximately 90% of hospital staff had the opportunity to contact patients and more than 60% of hospitals staff had the opportunity to provide care to patients.

Table 2. positive response rates (%) of 12 dimensions in decreasing order

Researcher Survey year Number of valid respondents	Hirose et al 2013 641	Hirose et al 2019 640	Taneda et al ¹⁴⁾ 2005-2006 11087	Kigawa et al ¹⁵⁾ 2011 6963	Okuyama et al ¹⁸⁾ 2008-2015 755415 (582 studies)	US HSOPS data base	
						2007 ¹⁹⁾ 102732	2018 ²⁰⁾ 345850
D12: Teamwork within units	77.4 (1)	75.6 (2)	70	70	75 (73-76)	78	82
D10: Supervisor/Manager expectations and actions that promote patient safety	74.2 (2)	77.7 (1)	54	62	61 (59-64)	74	80
D3: Frequency of events reported	66.7 (3)	68.7 (4)	63	68	48 (45-52)	59	67
D2: Feedback and communication about error	63.7 (4)	69.3 (3)	45	53	54 (51-57)	62	69
D7: Organizational learning/continuous improvement	56.5 (5)	57.4 (5)	56	55	70 (67-73)	69	72
D6: Non-punitive response to error	53.0 (6)	55.6 (6)	41	43	33 (30-37)	43	47
D1: Communication Openness	51.1 (7)	54.9 (7)	39	49	47 (44-51)	61	66
D8: Overall perceptions of patient safety	47.2 (8)	47.7 (8)	49	53	54 (51-56)	63	66
D5: Management support for patient safety	45.3 (9)	44.6 (9)	54	52	53 (48-57)	69	72
D11: Teamwork across units	42.8 (10)	42.9 (10)	49	44	50 (47-53)	63	62
D4: Hospital handoffs and transitions	38.5 (11)	38.1 (11)	35	35	45 (44-47)	45	48
D9: Staffing	26.4 (12)	26.9 (12)	27	37	36 (33-40)	55	53
Overall average	53.6	55.0	48.5	51.8	52.2	61.8	65.3
	(rank)	(rank)			(95%Confidential Interval)		

Table 2 shows positive response in 2013 and 2019 in decreasing order with the previous results in Japan [1,2], Okuyama et al. [3] and AHRQ reports in 2007[4] and 2018 [5].

1. Although a slight variation between 2013 and 2019 in this study was found in each dimension, the differences of positive response were positive and the average responses were 53.6% in 2013 and 55.0% in 2019.
2. The dimensions with more than 50% positive response were D10, D12, D2, D1, D7, D6, and D3. The top four dimensions were D12, D10, D3 and D2 in both years.
3. The highest dimension was D12 with 77.4% in 2013 and D10 with 77.7% in 2019 and the last place was D9 with 26.4% in 2013 and 26.9% in 2019.
4. The fifth to twelfth places were the same places in both years, and the last three were D11, D4 and D9.
5. Although the Dimension 6: Non-punitive response to error was the one with lowest score, D6 in this study was not so.
6. Although the Dimension 12: Teamwork within units was the highest one, D12 in this study was same.

Table 3. *positive response rate by profession between 2013 and 2019 from the unit- and hospital-level*

		total		physicians		nurses		medical staff		office workers		others	
		2013	2019	2013	2019	2013	2019	2013	2019	2013	2019	2013	2019
Unit-level aspects of patient safety													
D10	Supervisor/Manager expectations that promote patient safety	74.2	77.7	69.7	75.0	80.2	80.6	65.6	74.5	70.8	68.8	73.8	82.8
D7	Organizational learning/continuous improvement	56.5	57.4	55.0	58.0	63.7	59.6	50.2	61.5	46.1	29.8	46.5	58.1
D12	Teamwork within units	77.4	75.6	76.6	78.0	83.4	81.0	64.6	66.7	73.3	56.9	78.8	84.5
D1	Communication openness	51.1	54.9	55.8	63.3	51.4	56.2	43.2	50.4	51.6	37.4	47.9	56.7
D2	Feedback and communication about error	63.7	69.3	55.9	60.9	74.7	76.3	52.9	70.4	57.4	40.3	46.0	53.6
D6	Non-punitive response to error	53.0	55.6	51.6	56.0	55.7	58.6	53.3	52.7	49.6	42.9	38.7	56.3
D9	Staffing	26.4	26.9	26.9	30.6	26.0	25.6	23.0	25.4	27.3	31.6	30.3	29.9
average		57.5	59.6	55.9	60.3	62.2	62.6	50.4	57.4	53.7	44.0	51.7	60.3
Hospital-level aspects of patient safety													
D5	Management support for patient safety	45.3	44.6	38.1	41.1	44.0	45.5	52.3	39.1	50.7	53.4	53.7	53.8
D11	Teamwork across units	42.8	42.9	46.2	49.2	40.3	43.4	44.2	38.1	44.6	39.2	39.2	46.7
D4	Handoffs and transitions	38.5	38.1	37.8	35.9	39.9	42.7	36.6	30.1	34.6	22.2	46.0	41.1
average		42.2	41.9	40.7	42.1	41.4	43.8	44.4	35.7	43.3	38.3	46.3	47.2
Two outcome variables													
D8	Overall perceptions for patient safety	47.2	47.7	46.0	46.0	47.2	46.7	44.6	52.1	51.8	44.6	50.2	61.3
D3	Frequency of events reported	66.7	68.7	57.0	54.6	74.1	74.8	60.8	66.1	69.2	54.7	47.1	66.7
average		56.9	58.2	51.5	50.3	60.6	60.8	52.7	59.1	60.5	49.6	48.6	64.0
Overall average		53.6	55.0	51.4	54.1	56.7	57.6	49.3	52.3	52.3	43.5	49.8	3.6

(A) Seven unit-level aspects of safety culture: D10, D7, D12, D1, D2, D6, D9: Except D9, six remaining dimensions were more than 50% and their positive response was 57.5% in 2013 and 59.6% in 2019 on the average.

(B) Three hospital-level aspects of safety culture: D5, D11, D4: All three dimensions were less than 50% in both years and the negative differences between 2013 and 2019 were -0.7% (45.3% to 44.6%) in D5 and -0.4% (38.5% to 38.1%) in D4.

(C) Two outcome variables: D8, D3. Although the average of the two dimensions increased by 1.4% from 56.9% in 2013 to 58.2% in 2019, D3 of physicians, D8 of nurses and both dimensions of office workers decreased.

Table 4: Dimensions of low-scored (less than 50%) percent positive responses by professional 1

		total		physicians		nurses		medical staff		office workers		others	
		2013	2019	2013	2019	2013	2019	2013	2019	2013	2019	2013	2019
D5	Management support for patient safety	45.3	44.6	38.1	41.1	44.0	45.5	52.3	39.1	50.7	53.4	53.7	53.8
f1	Hospital management provides a work climate that promotes patient safety.	56.2	54.3	46.0	53.5	53.8	54.3	70.0	51.2	65.0	63.8	50.0	46.2
f8	The actions of hospital management show that patient safety is a top priority.	34.0	36.0	29.2	33.0	33.3	36.4	35.2	28.1	38.8	52.8	48.1	53.8
f9*	Hospital management seems interested in patient safety only after an adverse event happens. (negatively worded)	45.8	43.5	39.0	36.7	45.0	45.7	51.6	38.0	48.4	43.6	63.0	61.5
D11	Teamwork across units	42.8	42.9	46.2	49.2	40.3	43.4	44.2	38.1	44.6	39.2	39.2	46.7
f2*	Hospital units do not coordinate well with each other.	22.2	22.9	22.6	26.0	22.9	23.8	23.3	23.8	21.0	10.2	13.8	25.0
f4	There is good cooperation among hospital units that need to work together.	53.1	52.4	58.4	57.4	49.5	54.1	54.9	44.6	54.6	50.0	52.0	53.8
f6*	It is often unpleasant to work with staff from other hospital units.	55.9	57.0	55.6	60.4	50.9	58.4	68.1	51.7	60.0	52.9	54.5	62.5
f10	Hospital units work well together to provide the best care for patients.	39.9	39.3	48.2	53.1	37.9	37.2	30.3	32.2	42.9	43.6	36.4	45.5
D4	Handoffs and transitions	38.5	38.1	37.8	35.9	39.9	42.7	36.6	30.1	34.6	22.2	46.0	41.1
f3*	Things "fall between the cracks" when transferring patients from one unit to another.	21.0	18.0	21.6	19.6	20.2	19.5	18.1	13.7	19.7	16.1	42.1	0.0
f5*	Important patient care information is often lost during shift changes.	51.6	41.8	42.0	39.2	58.1	45.9	49.4	35.1	45.1	10.0	52.9	85.7
f7*	Problems often occur in the exchange of information across hospital units.	42.8	44.3	47.4	44.9	43.0	47.8	46.2	37.5	32.3	35.7	41.7	50.0
f11*	Shift changes are problematic for patients in this hospital.	38.7	48.3	40.2	40.0	38.3	57.5	32.9	33.9	41.2	26.9	47.4	28.6

D5: Most of positive responses of D5 by profession were 30% range in f8 and then positive responses of clinical staff in 2019

D11: The lowest items among four items in D11 was f2*.

D4: The lowest items among four items in D4 was f3*

Table 5: Dimensions of low-scored (less than 50%) percent positive responses by professional

		total		physicians		nurses		medical staff		office workers		others	
		2013	2019	2013	2019	2013	2019	2013	2019	2013	2019	2013	2019
D9	Staffing	26.4	26.9	26.9	30.6	26.0	25.6	23.0	25.4	27.3	31.6	30.3	29.9
a2	We have enough staff to handle the workload.	14.4	15.4	24.4	25.0	7.5	14.4	6.6	8.2	23.6	13.3	31.3	40.0
a5*	Staff in this unit work longer hours than is best for patient care.	6.2	11.2	3.7	6.1	5.4	12.9	6.9	5.0	11.3	40.7	16.0	0 . 0
a7*	We use more agency/temporary staff than is best for patient care.	43.0	44.2	41.1	44.3	51.0	42.8	42.2	53.5	19.4	26.7	30.8	33.3
a14*	We work in "crisis mode" trying to do too much, too quickly.	42.0	36.7	38.2	47.0	40.4	32.4	36.3	34.7	54.9	45.8	43.3	46.2

With regard to D9, the positive responses were 26.4% in 2013 and 26.9% in 2019 and there was almost no change between the two years.

The positive response of clinical staff was the lowest among health care professionals.

WHY THE POSITIVE RESPONSE OF D9 “STAFFING” IS THE LOWEST AMONG DIMENSIONS?

- Two items of a2: “We have enough staff to handle the workload” and a5*: “Staff in this unit work longer hours than is best for patient care” were extremely low. It might prove that health care professionals are not satisfied with their long working hours in the targeted hospital. Among the 12 dimensions of PSC, long working hours had an impact on ‘Staffing’, according to the previous studies [6]. In other words, it might be saying that health care professionals in hospital settings in Japan are satisfied with working environments.
- Why health care professionals are not satisfied with their working environment in Japan? Although previously pointed, the numbers of doctors and nurses per 1000 population in Japan are 2.5 and 11.3 (average of OECD countries: 3.6 and 8.8) [7]. In addition, the numbers of beds, hospitals and clinics in 2019 are 1620097, 8300, and 102616, respectively [8], and the man power are dispersed into many medical facilities. As a result, many hospitals have been suffering from the shortage of health care workers, and it is easily expected that hospital staff at medical facilities are not satisfied with their working environment.
- More particularly, in Japan, many medical facilities get income as reward for providing health care based on the social insurance medical fee schedule indicating an official price one by one under the nationally uniform Japanese universal health insurance system. Medical fee consists of main clinical service items including medical administrative charges, medication charges, injection charges, procedure/surgery charges, laboratory examination charges, diagnostic imaging charges, and hotel charges. For example, the number of nurses limits according to the medical administrative charges under the schedule.

Therefore, unless the fundamental issues in Japanese health care system is resolved, working environment at medical facilities in Japan has not been improved and the positive response of D9 will not be raised in future as well.

REFERENCES

1. Taneda K, Okumura Y, Aizawa H. Reliability and validity of the Japanese version of the Hospital Survey on Patient Safety Culture Japanese Journal of Quality and Safety in Healthcare 2009;4(1):10-24. (in Japanese with English Abstract)
2. Kigawa M, Fujita S, Seto K, Matsumoto K, Hirao T, Haswgawa T, Hasegawa T. Questionnaire on patient safety culture for hospitals by the US Agency for Health Care Research and Quality The Journal of Japan Society for Health Care Management 2010;11(1):2-14. (in Japanese with English Abstract)
3. Okuyama JHH, Galvao TF, Silva MT. et al. Healthcare professional's perception of patient safety measured by the hospital Survey on Patient Safety Culture: A systematic review and meta-analysis. The Scientific World Journal 2018 Jul 19;2018:9156301. doi: 10.1155/2018/9156301. eCollection 2018.
4. Agency for Healthcare Research and Quality Hospital Survey on Patient Safety Culture: 2007 Comparative Database Report (Managed and prepared by Rockville W et al, under Contract No. 233-02-0087). AHRQ Publication No. 07-0025, Agency for Healthcare Research and Quality, Rockville, MD, USA, 2007.
<https://archive.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/hospital/2007/hospsurveydb1.pdf>
5. Agency for Healthcare Research and Quality. Hospital Survey on Patient Safety Culture: 2018 User Database Report (Managed and prepared by Rockville W et al, under Contract No. NHA 290201300003C). AHRQ Publication No. 18-0025-EF, Agency for Healthcare Research and Quality, Rockville, MD, USA, 2018.
<https://www.ahrq.gov/sites/default/files/wysiwyg/sops/quality-patient-safety/patientsafetyculture/2018hospitalsopsreport.pdf>
6. Wu Y, Fujita S, Seto K et al., "The impact of nurse working hours on patient safety culture: A cross-national survey including Japan, the United States and Chinese Taiwan using the Hospital Survey on Patient Safety Culture. *BMC Health Service Research* 2013; 13:394.
7. OECD Health Data. HEALTH AT A GLANCE 2019. <https://www.oecd-ilibrary.org/docserver/4dd50c09-en.pdf?expires=1675751873&id=id&accname=guest&checksum=554AC03EE50ECC1E423542E44CA3C613>
8. Ministry of Health, Labour, and Welfare. Survey of Medical Institutions 2019. <https://www.mhlw.go.jp/toukei/saikin/hw/iryosd/19/dl/02sisetu01.pdf>