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Qualitative evaluation of Japanese secondary emergency medical institutions using a self-evaluation index nationwide

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Objective: This study aimed to conduct a qualitative evaluation of secondary emergency medical institutions based on a self-checklist and to confirm the usefulness of this evaluation.
Methods: Using data from a survey of secondary emergency medical institutions conducted by the Ministry of Health, Labour and Welfare in FY2015 and 2017, we analyzed the implementation rate of items by the field, year, and region.
Results: Overall, 1,019 facilities that responded to the self-checklist for two consecutive years were included. The mean implementation rate for all 55 items was 83.3 ± 14.3% in FY2015 and 86.4 ± 13.1% in FY2017, showing a statistically significant improvement. However, in the mean implementation rate of each field from A to F, field A (work system) was the lowest in each year (66.1 ± 27.2% in FY2015, 67.5 ± 26.2% in FY2017). Regarding the mean implementation rate by item, A2 (full-time nurses) and A4 (full-time clinical laboratory technicians) had implementation rates below 50%, which was significantly lower than the other items. There were no significant differences in the mean implementation rates among the regions.
Conclusion: Secondary emergency medical facilities may be able to independently make efforts to improve the quality of their services by using this self-checklist reflecting this implementation rate.

Key words: emergency medicine, regional medical programs, self-evaluation programs

Introduction

In spite of Japan's declining population, the number of emergency patients has been increasing because its inhabitants are aging.[1,2] The number of people transported to the emergency department has been on a consistent upward trend every year. This trend is expected to continue in the future; therefore, the importance of improving the emergency medical system is increasing. Japan's emergency medical system has three categories: primary emergency facilities responsible for mild cases that can be transferred or returned to outpatient clinics; secondary emergency facilities responsible for moderate cases that require inpatient treatment; and tertiary emergency facilities responsible for severe cases that require ICU (intensive care unit) management.[3] Among these, tertiary emergency medical facilities have objective qualitative and quantitative evaluation indices established through a satisfaction survey conducted by the Ministry of Health, Labour and Welfare. This evaluation may incentivize these emergency medical systems, resulting in the assurance of the quality of medical care.[4]

However, tertiary indications for critically ill patients account for only 10% of emergency patients, and as much as 75% of emergency patients are transported to secondary emergency medical facilities.[5] Therefore, although evaluating and maintaining the quality of secondary emergency medical institutions is essential to improve the emergency medical system, appropriate evaluation indices are yet to be established despite the high number of these facilities. However, the emergency medical systems vary according to the region in which they are located, regarding population, number of facilities, and number of physicians, among other factors. As such, uniform nationwide evaluation indices similar to the satisfaction evaluation of tertiary emergency medical institutions may not apply to the actual conditions of each individual system.[6]

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Table 1-1. Self-checklist and self-checklist of second emergency medical institutions

Field/No. (Item)	1 point	0 points
A. Work system for doctors and nurses		
1. It is possible to call for assistance when there is a shortage of nurses in the Emergency Department.	☐ Yes	☐ No
2. Full-time nurses work in the Emergency Outpatient Department.	☐ Yes	☐ No
3. The on-call system can call physicians as needed.	☐ Yes	☐ No
4. There is a shift system for laboratory technicians.	☐ Yes	☐ No
5. There is a shift system for radiological technologists.	☐ Yes	☐ No
B. Facilities and equipment in the Emergency Department		
6. There is an emergency patient-specific treatment room.	☐ Yes	☐ No
7. The Emergency Department is always equipped with an ECG monitor.	☐ Yes	☐ No
8. Defibrillators are always available	☐ Yes	☐ No
9. Pulse oximeters are always available	☐ Yes	☐ No
10. Aspirators are always available and are inspected daily	☐ Yes	☐ No
11. Airways, Ambu bags, masks, and tracheal intubation sets are always available.	☐ Yes	☐ No
12. Airway management devices (as in B11) for adults and children are always available.	☐ Yes	☐ No
13. Surgical airway management equipment (cricothyroid [ligament] puncture, tracheostomy, etc.) is always available.	☐ Yes	☐ No
14. Abdominal ultrasound diagnostic equipment is always available. B15 The equipment and medicines required for the emergency cart are always available.	☐ Yes	☐ No
15. The equipment and medicines required for the emergency cart are always available.	☐ Yes	☐ No
C. Management and operation of the Emergency Department		
16. Primary care of patients outside the specialty of the treating physician is also accepted as a secondary emergency medical institution.	☐ Yes	☐ No
17. There is a registration ledger for emergency patients, which describes the name, age, diagnosis, visit time, and transportation method.	☐ Yes	☐ No
18. The order of examination is changed according to the degree of urgency and severity.	☐ Yes	☐ No
19. The doctor contacts the medical institution to which the patient is transferred.	☐ Yes	☐ No
20. Easy consultation is possible with a tertiary emergency medical institution.	☐ Yes	☐ No
21. Someone from the medical institution is present at the meeting/committee of emergency medical services in the community.	☐ Yes	☐ No
22. Emergency carts are checked daily and reported to the director.	☐ Yes	☐ No
23. Emergency carts have a defined location and can be used quickly.	☐ Yes	☐ No
24. The locations of the emergency carts are well known to physicians.	☐ Yes	☐ No
25. The procedure for responding to sudden changes by in-hospital doctors is clearly defined.	☐ Yes	☐ No
D. Emergency Department examinations		
26. Emergency tests for crossmatch, blood group, and pregnancy response can be performed.	☐ Yes	☐ No
27. Myocardial deviation enzymes can always be measured.	☐ Yes	☐ No
28. Arterial blood gas test can be performed rapidly.	☐ Yes	☐ No
29. Laboratory technicians can perform emergency tests including peripheral blood tests, blood chemistry tests, and urinalysis on holidays and at night.	☐ Yes	☐ No

Table 1-2. Self-checklist and self-checklist of second emergency medical institutions

Field/No. (Item)	1 point	0 points
30. The results of emergency tests such as blood tests and urinalyses are promptly reported.	☐ Yes	☐ No
31. Abdominal ultrasound can always be performed.	☐ Yes	☐ No
32. Immediate radiography can be performed.	☐ Yes	☐ No
33. Head and neck computed tomography (CT) can always be performed.	☐ Yes	☐ No
34. Thoracoabdominal CT can always be performed.	☐ Yes	☐ No
35. Thoracoabdominal contrast CT imaging can always be performed.	☐ Yes	☐ No
E. Medical safety and Infection control		
36. All physicians and nurses working outside the Emergency Department regularly receive medical safety training.	☐ Yes	☐ No
37. The Emergency Department is equipped with all and sufficient disposable gloves, masks, goggles, and gowns.	☐ Yes	☐ No
38. Physicians and nurses always wear gloves during treatments in the Emergency Department.	☐ Yes	☐ No
39. Healthcare professionals wear masks, goggles, and gowns whenever there is a possibility that blood or body fluids may be dispersed.	☐ Yes	☐ No
40. The Emergency Department is equipped with an infectious waste container.	☐ Yes	☐ No
41. Hepatitis B antibody-negative healthcare workers working in the Emergency Department are vaccinated.	☐ Yes	☐ No
42. Measures to prevent needlestick or sharp injuries have been established.	☐ Yes	☐ No
43. For needlestick or sharp injuries, there is a system for rapid, 24-hour response.	☐ Yes	☐ No
44. For accidents involving contamination of blood or body fluids, there is a system to investigate the cause, take measures, and make improvements toward prevention.	☐ Yes	☐ No
45. Sufficient measures are taken to prevent secondary infections when a tuberculosis patient visits the hospital.	☐ Yes	☐ No
F. Medical care		
46. In the hospital, doctors and nurses are educated and trained in emergency resuscitation.	☐ Yes	☐ No
47. If ventricular fibrillation occurs in the Emergency Department, defibrillation can always be performed within 1 minute.	☐ Yes	☐ No
48. ECG can be recorded in patients with chest pain within enough time after presentation.	☐ Yes	☐ No
49. Patients with acute myocardial infarction have been treated with reperfusion therapy or can be transferred to a center for such.	☐ Yes	☐ No
50. Patients with abdominal pain or acute abdomen are accepted.	☐ Yes	☐ No
51. Cervical fusion without cervical spinal cord injury is ruled out in trauma patients.	☐ Yes	☐ No
52. Regular monitoring and recording of consciousness and pupillary findings	☐ Yes	☐ No
53. Pediatric dosage lists are always available in the Emergency Department and can be referred to immediately.	☐ Yes	☐ No
54. Textbooks on poisoning are always available in the Emergency Department and can be referred to immediately.	☐ Yes	☐ No
55. Doctors and nurses can promptly contact the Japan Poison Information Center.	☐ Yes	☐ No

Based on this background, to identify new evaluation indices for secondary emergency medical institutions, we created a self-checklist for secondary emergency medical institutions (herein after simply referred to as the self-checklist) that self-evaluates fulfillment through questions related to 55 items in 6 fields: A. Work system for doctors and nurses, B. Facilities and equipment in the Emergency Department, C. Management and operation of the Emergency Department, D. Emergency Department examinations, E. Medical safety and Infection control, and F. Medical care (Table 1).[7] We extracted items considered necessary for the secondary medical system in previous studies[8-11] and determined the validity of each item with the help of a questionnaire-based survey. The purpose of this study is to clarify the usefulness of our self-checklist in the evaluation of secondary emergency medical institutions to contribute to the creation of an evaluation system that helps improve the quality of secondary emergency medical institutions.

Materials and Methods

Study design and population

This is a retrospective study that analyzed the self-checklist for secondary emergency medical institutions nationwide conducted in FY2015 and 2017. Secondary emergency medical institutions are responsible for emergency medical care of cases that require hospitalization and are designated as such in the medical plan prepared by each prefecture. The self-checklist was created and implemented as part of a joint study in the Ministry of Health, Labour and Welfare Science Research Grant Regional Medical Infrastructure Development Promotion Research Project "Research on Promotion of Emergency Medical Care System" (Principal Investigator: Yasuhiro Yamamoto).[8-11]

The facilities were analyzed using available data for 2 years (FY2015 and 2017) for this study, and facilities with missing data were excluded.

Data collection

In FY2015, the Ministry of Health, Labour and Welfare, through the Regional Medical Care Division of the MHLW Medical Affairs Bureau, requested the health departments of 47 prefectures to distribute the "survey forms and self-surveys" to secondary medical institutions nationwide, and collected the data by mail from secondary medical institutions that offered cooperation. In FY2017, the survey was handled as "one of the surveys requested by the Ministry of Health, Labour and Welfare to prefectures," and we received the survey results from the Ministry of Health, Labour and Welfare.

Each medical institution evaluated its degree of fulfillment based on the 55-item self-checklist that focuses on 6 fields. The institutions were asked to answer, "Yes" or "No" in each question on an Excel spreadsheet. Institution representatives, who knew the on-site situation, filled out the self-checklist. These respondents were not necessarily physicians. In each question, the score and total score in each field were calculated by considering, "Yes" as 1 point and "No" as 0 points. The Ministry of Health, Labour and Welfare in each prefecture collected the self-checklists and provided us with the data.

Study outcome

The primary endpoints in this study were the mean implementation rate of each item on the self-checklists and the mean implementation rate of each field A to F at the target medical institution. In addition, the secondary endpoints included the mean implementation rate of each A to F by region and the change in the implementation rates by comparisons between the surveys conducted in the 2 fiscal years. The regions were divided into 8 areas (Table 2) according to the location of the medical institution.

Statistical analyses

We calculated the mean implementation rate for each field by (the number of respondents who answered, "Yes" in each field)/(the total number of responses in each field).

Table 2. Regions and prefectures

Hokkaido	Hokkaido
Tohoku	Aomori, Iwate, Miyagi, Akita, Yamagata, Fukushima
Kanto	Ibaraki, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa
Chubu	Niigata, Toyama, Ishikawa, Fukui, Yamanashi, Nagano, Gifu, Shizuoka, Aichi
Kinki	Mie, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama
Chugoku	Tottori, Shimane, Okayama, Hiroshima, Yamaguchi
Shikoku	Tokushima, Kagawa, Ehime, Kochi
Kyushu	Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima, Okinawa

The continuous data were presented as mean ± standard deviation, and categorical data were presented as percentages. Furthermore, we used a *t*-test to evaluate the implementation rate through a 2-year comparison, a secondary outcome. Finally, we set the significance level of less than 5% for all statistical processing. We used SPSS version 27 (IBM SPSS Statistics, Chicago, IL, USA) for all statistical analyses.

Ethics approval

The Kitasato University Hospital Ethics Committee determined that not being a study of human subjects it did not require review (B21-085).

Results

Responses were obtained from 1,339 institutions in FY2015 and 3,973 institutions in FY2017. We excluded

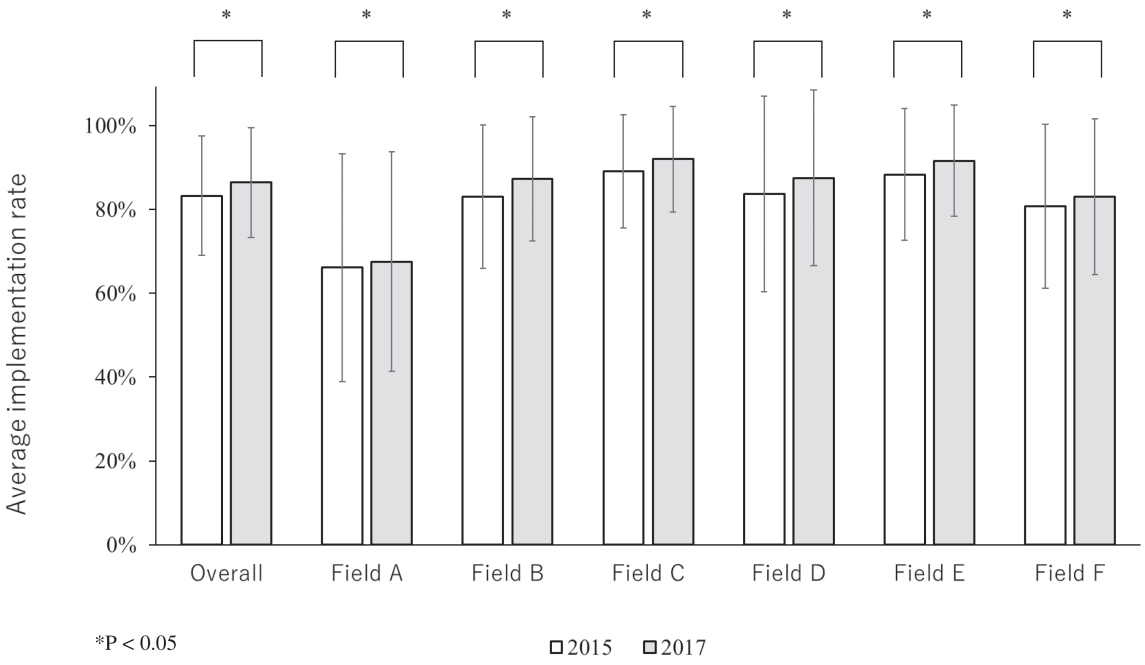

Figure 1. Changes in the overall self-checklist and the mean implementation rate by field

The mean implementation rates were 66.1 ± 27.2% vs. 67.5 ± 26.2% in the A field, 83.0 ± 17.1% vs. 87.3 ± 14.8% in the B field, 89.0 ± 13.5% vs. 92.0 ± 12.6% in the C field, 83.7 ± 23.3% vs. 87.5 ± 20.9% in the D field, 88.3 ± 15.8% vs. 91.6 ± 13.3% in the E field, and 80.7 ±195% vs. 83.0 ± 18.6% in the F field. The implementation rate of the A field was the lowest. The differences between the average implementation rates in FY2015 and 2017 were: overall, 3.1% ± 10.0%; A field, 1.4% ± 21.7%; B field, 4.3% ± 12.9%; C field, 3.0% ± 13.2%; D field, 3.8% ± 20.2; E field, 3.3% ± 15.3%; and F field, 2.3% ± 17.6%. All showed a statistically significant improvement tendency. (Overall: t [1018] = 10.06, P < 0.01; A: t [1018] = 2.08, P = 0.04; B: t [1018] = 10.66, P < 0.01; C: t [1018] = 7.28, P < 0.01; D: t [1018] = 5.95, P < 0.01; E: t [1018] = 6.78, P < 0.01; F: t [1018] = 4.15, P < 0.01)

Table 3. Same facility changes in implementation rates between FY2015 and FY2017

Field	Average difference	95% Confidence interval	P value
Overall	3.1% ± 10.0%	2.5%－3.8%	*
A	1.4% ± 21.7%	0.1%－2.7%	*
B	4.3% ± 12.9%	3.5%－5.1%	*
C	3.0% ± 13.2%	2.2%－3.8%	*
D	3.8% ± 20.2%	2.5%－5.0%	*
E	3.3% ± 15.3%	2.3%－4.2%	*
F	2.3% ± 17.6%	1.2%－3.4%	*

*P < 0.05

the institutions that only had responses from only 1 fiscal year (e.g., 320 institutions only had responses for FY2015, and 2,954 only had responses for FY2017). Thus, there was a total of 1,019 institutions in these analyses.

The overall mean implementation rate of the self-checklist was 83.3 ± 14.3% in FY2015 and 86.4 ± 13.1% in FY2017. Thus, there was a statistically significant improvement compared to the previous fiscal year. In terms of the mean implementation rate from A to F fields, the C field (management and operation) and the E field (infection control) were high each year (FY2015: C 89.0 ± 13.5%, E 88.3 ± 15.8%; FY2017: C 92.0 ± 12.6%, E 91.6 ± 13.3%). On the other hand, field A (work system) had the lowest mean implementation rate in each fiscal year, which was 66.1 ± 27.2% in FY2015 and 67.5 ± 26.2% in FY2017, with no statistically significant improvement (Figure 1).

The implementation rate at the same facility improved by 3.1 ± 10.0% overall in fields A－F from FY2015 to FY2017. There were improvements in all areas, and 4.3 ± 12.9% of the areas from A to F improved the most. On the other hand, the rate of improvement in area A (work system) was low, at only 1.4 ± 21.7%. These results were statistically significant (Table 3). Regarding the mean implementation rate by item, A2 (full-time nurses in the Emergency Outpatient Department) and

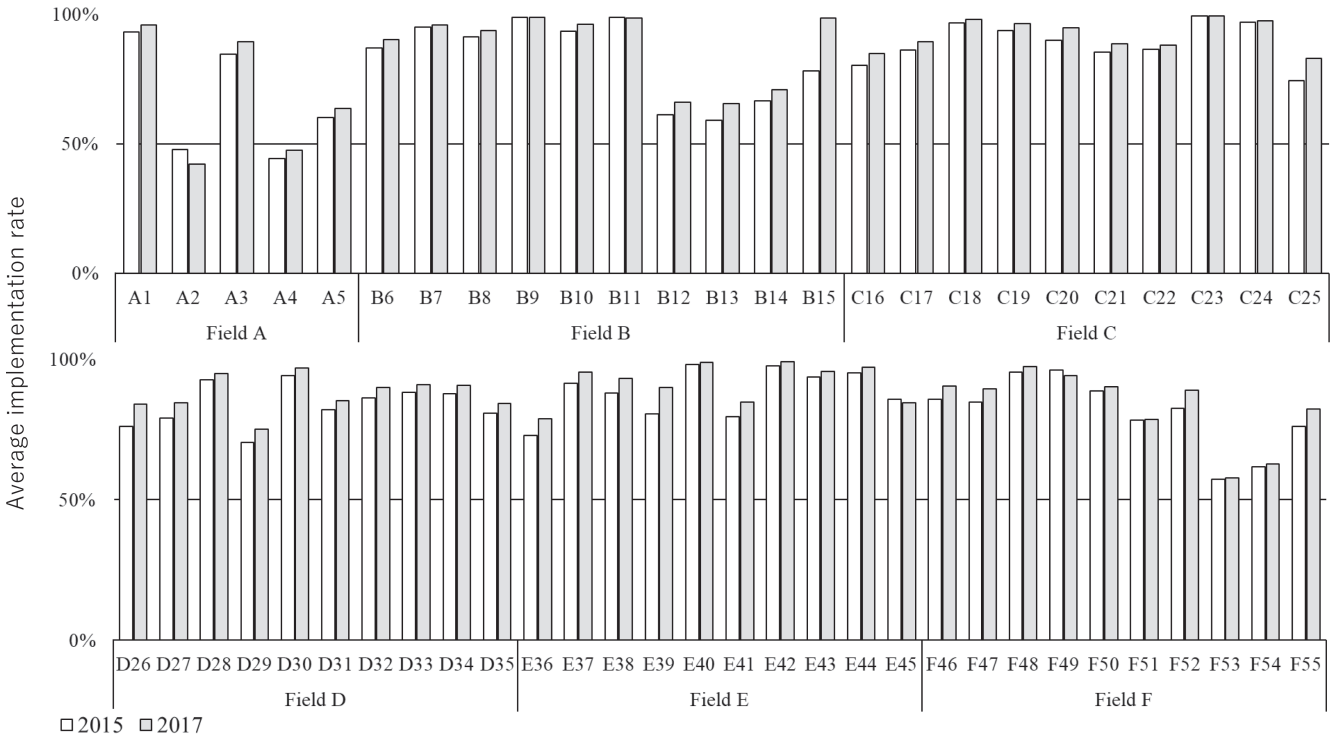

Figure 2. All items other than A2 (Full-time nurse in the Emergency Outpatient Department) and A4 (clinical laboratory technician shift system) had an implementation rate of 50% or more. A2, 48.0 ± 50.0% (FY2015) and 42.1 ± 49.4% (FY2017); A4, 44.5 ± 49.7% (FY2015) and 47.5 ± 50.0% (FY2017). A2 was the only item of the 55 that showed a decrease in the implementation rate compared to that in the previous year.

Table 4. Numbers of facilities with improved implementation rates

Field	Improved	No change	Decreased
Overall	57.7% (n = 588)	12.3% (n = 125)	30.0% (n = 306)
A	26.7% (n = 272)	48.8% (n = 497)	24.5% (n = 250)
B	39.5% (n = 403)	43.0% (n = 438)	17.5% (n = 178)
C	37.1% (n = 378)	44.5% (n = 453)	18.4% (n = 188)
D	32.1% (n = 327)	51.6% (n = 526)	16.3% (n = 166)
E	35.5% (n = 362)	43.4% (n = 442)	21.1% (n = 215)
F	36.8% (n = 375)	35.0% (n = 357)	28.2% (n = 287)

A4 (shift system of the clinical laboratory technicians) had less than 50% implementation rates, which was significantly lower than other items ($P < 0.05$). A2 was the only item whose implementation rate decreased compared to the previous year (Figure 2).

In terms of changes in the implementation rate at the same facility, 57.7% (n = 588) of the total facilities showed an increase in the implementation rate, while 30.0% (n = 306) showed a decrease. On the other hand, 30.0% (n = 306) of the facilities showed a decrease in the implementation rate. The percentage of facilities that improved the implementation rate was the highest in field B (39.5%, n = 403), while the percentage of facilities that improved the implementation rate in field A was the lowest at 26.7% (n = 272). The percentage of facilities that decreased the implementation rate was the highest in field F, at 28.2% (n = 287). Field A, with 24.5% (n = 250), had the second highest percentage of facilities with a decrease in the implementation rate (Table 4).

By regions, the highest mean implementation rate was in the Chubu region (87.1 ± 12.1% in FY2015 and 90.2 ± 9.0% in FY2017). In all the other regions, the implementation rates exceeded 80% in FY2017. When comparing the 2 fiscal years, the mean implementation rate improved the most in the Kanto region, with an increase of 4.9 ± 11.1%, which was statistically significant ($t = 7.60$, df = 298, $P < 0.05$). There were no regions where the implementation rates decreased with respect to the previous fiscal year. However, the improvement rate was as low as 1.0 ± 8.7% in the Hokkaido region and 1.5 ± 10.4% in the Kinki region, with no statistically significant difference between FY2015 and 2017 (e.g., Hokkaido region: $t = 0.82$, df = 51, $P = 0.42$; Kinki region: $t = 1.98$, df = 189, $P = 0.05$) (Figure 3).

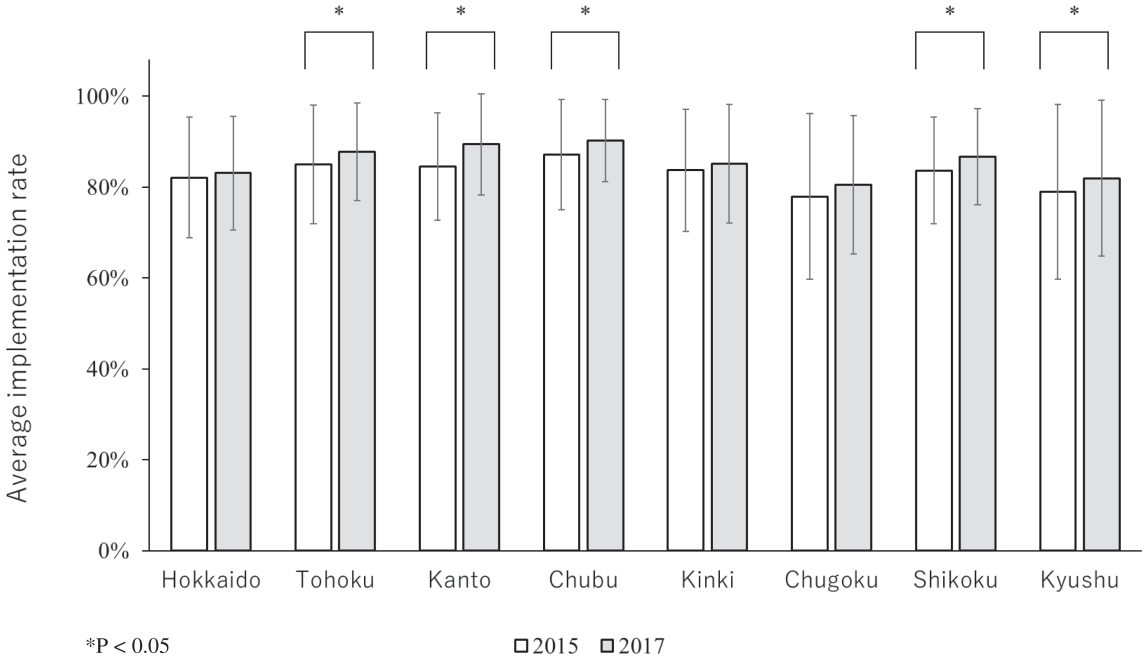

Figure 3. Changes in the mean implementation rates by region in the self-checklist

Comparing the overall mean implementation rate between FY2015 and 2017, the mean implementation rates were 82.1% ± 13.3% vs. 83.1% ± 12.5% in the Hokkaido region, 85.0% ± 13.1% vs. 87.8% ± 10.7% in the Tohoku region, 84.5% ± 11.8% vs. 89.4% ± 11.2% in the Kansai region, 84.5% ± 11.8% vs. 89.4% ± 11.2% in the Kanto region, 87.1% ± 12.1% vs. 90.2% ± 9.0% in the Chubu region, 83.7% ± 13.4% vs. 85.2% ± 13.1% in the Kinki region, 78.0% ± 18.2% vs. 80.5% ± 15.2% Chugoku region, 83.7% ± 11.7% vs. 86.7% ± 10.6% in the Shikoku region, and 79.0% ± 19.3% vs. 81.9% ± 17.2% in the Kyushu region. The difference between the average implementation rates between FY2015 and 2017 were 1.0% ± 8.7% in the Hokkaido region, 2.8% ± 8.3% in the Tohoku region, 4.9% ± 11.1% in the Kanto region, 3.1% ± 7.8% in the Chubu region, 1.5% ± 10.4% in the Kinki region, 2.6% ± 9.9% in the Chugoku region, 3.0% ± 9.7% in the Shikoku region, and 3.0% ± 9.4% in the Kyushu region. Statistically significant improvements were noted in the Tohoku region (t [90] = 3.23, $P < 0.01$), Kanto region (t [298] = 7.60, $P < 0.01$), Chubu region (t [89] = 3.77, $P < 0.01$), Shikoku region (t [84] = 2.88, df = 84, $P = 0.01$), and Kyushu region (t [169] = 4.13, df = 169, $P < 0.01$). Statistically significant improvements were not noted in the Hokkaido region (t [51] = 0.82, $P = 0.42$), Kinki region (t [189] = 1.98, $P = 0.05$), and Chugoku region (t [41] = 1.68, $P = 0.10$).

Discussion

Because the self-checklist evaluation in this study can be repeated, confirming changes by fiscal year enabled the visualization of the fulfillment status and the improvement rates of items essential for the secondary medical care rotation in each secondary emergency medical institution. Furthermore, by comparing the implementation rates by regions, we found that evaluation indices can reflect the current state of the emergency medical system by region. When the 8 regions were categorized, it was found that there was a calibrated difference in the improvement of the secondary emergency system in each region. The Chubu region had the highest average implementation rate and improvement rate, while the Chugoku region had the lowest average implementation rate and the lowest improvement rate. In addition, the improvement rate was lower in the Kinki and Hokkaido regions than in the other regions, suggesting that progress in the development of the secondary emergency system is small in those regions. These factors suggest that regional differences in the secondary emergency system are becoming larger and a growing concern.

The present study clarified that the mean implementation rate of the work system of physicians and nurses was 66.1% in FY2015 and 67.5% in FY2017, demonstrating the insufficient numbers of physicians and nurses. In addition, because it is assumed that most emergency physicians work at emergency centers, it was estimated that the shortage of physicians in rural areas would place a heavy burden on the physicians in charge of emergency medical care at secondary emergency medical institutions, and that in some areas the survival of the secondary emergency medical care system would be in jeopardy. Self-checklists do not always provide sufficient incentives for self-assessment and voluntary and continuous quality improvement efforts based on results. In the United States, medical institutions are evaluated to improve the quality of medical care. In the United States and Europe, the P4P (Pay for Performance) system, which provides financial incentives to medical institutions for providing effective and high quality medical services, has been prevalent since the 2000s as one of the measures to improve the quality of medical care.[12] A relatively large number of quality metrics are used in the United States to assess the level of fulfillment of high-value medical goals.[13] In a report entitled "Emergency Medical Services at the Crossroads" published in 2006, the Institute of Medicine (IOM) recommended the development of "nationally standardized and evidence-based performance indices that can be used in interstate and national comparisons."[14] There have been reports that emergency medical institutions were obligated to implement quality control and improvement programs relying on key performance indices to continuously monitor the system's overall performance and effectiveness of various prehospital interventions.[15,16] Researchers have studied data quality for assessing emergency medical services from 5 perspectives: data integrity, accuracy, consistency, accessibility, and timeliness.[17] Since the 1990s in Japan, the Japan Council for Quality Health Care has evaluated the quality of medical care by the hospital function evaluation and the quality management system ISO9001. Healthcare professionals are continuously and actively working to improve the quality of healthcare.

Japan does not have an evaluation system for secondary emergency medical care. However, it is necessary to collect highly reliable data and submit them for appropriate evaluation. Donabedian states that the direct method of assessing healthcare quality is assessing the process, and the indirect method is the assessment of structure and outcome.[18] However, currently, the burden on secondary emergency medical institutions in Japan has increased because of the increase in the number of patients, which is associated with the country's aging population and the shortage of physicians in rural areas. As such, the secondary emergency medical system in some regions might not be able to continue functioning. Within this context, there is a risk that the secondary emergency medical system will collapse if the secondary emergency medical institution is evaluated superficially, especially if only the results are evaluated. Therefore, when evaluating a secondary emergency medical institution, the evaluation method should be less burdensome to the medical institution and easily lead to quality improvement considering the region's situation.[19]

Each prefecture is obligated to formulate its own regional medical concept. To carry out this data-based work, the Ministry of Health, Labour and Welfare provides data on the medical care provisions system in each area based on information from the Diagnosis Procedure Combination (DPC) and the National Database (NDB). With the development of medical big data such as the DPC and the NDB, it will be possible to assess progress over time. Furthermore, much data will be available to the public, which will allow medical facilities to think more concretely about their future.[20] Moreover, the NDB is a system in which all electronic receipts (medical, DPC, dentistry, and dispensing) and the Insurance Bureau of the Ministry of Health, Labour and Welfare collects specific medical examination data.

Although there is a restriction on receipt data, this mechanism can grasp the medical situation with integrity.[21] Many secondary emergency medical institutions will perform self-evaluation, and the results will be published, which may further promote efforts to improve the quality of emergency medical care according to the situation of each medical institution based on the data.

Limitations

This study targeted facilities that submitted self-checklist responses for FY2015 and 2017, therefore, it does not cover all secondary emergency medical institutions and may not accurately reflect the current status of all secondary emergency medical institutions. Furthermore, the self-checklist is a subjective evaluation of each facility, and there might have also been a risk of underestimation of the implementation rate. Moreover, quantitative evaluations do not consider regional characteristics, such as the population, the numbers of ambulance dispatches, emergency medical facilities, and emergency patients or the nature or degree of those emergencies. An ideal evaluation method would incorporate the perspective of society as a whole as to whether appropriate emergency medical care can be provided according to the region.

Conclusions

To correctly assess the quality of emergency medical care, a set of performance measures that reflect all aspects of emergency care is an essential component in advancing the improvement of emergency care. Therefore, we believe that each secondary emergency medical facility could voluntarily set an effort target for quality improvement by utilizing this proposed self-checklist that reflects the average implementation rate. Furthermore, we conducted a survey consisting of 55 items that emergency physicians considered to be the minimum necessary for secondary emergency medical institutions every other year. Therefore, if the implementation rate improves, as a result of each medical institution's developmental efforts, these 55 items will become the standard. And, when that happens, the quality of secondary emergency medical institutions in Japan will definitely improve.

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Conflicts of Interest: None

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