Abstract

Background: The greater satisfaction of residents in non-university hospitals in Japan found in a previous survey may reflect a better educational environment in these hospitals compared to university hospitals.

Purpose: To compare the educational environment of university hospitals and non-university hospitals.

Method: A cross-sectional survey was sent to 6725 1st-year resident physicians. The Postgraduate Hospital Educational Environment Measure (PHEEM) was used as a reliable and validated instrument to evaluate the educational environment of teaching hospitals.

Results: A total of 2429 PGY-1 physicians-in-training (38% women) completed the questionnaire (response rate, 36%). The mean total scores on the PHEEM ranged from 77 to 125 (mean, 99) for 80 university hospitals, and from 46 to 149 (mean, 102) for 255 non-university hospitals. The PHEEM score was significantly higher for non-university hospitals compared to university hospitals ($p=0.001$). Among the top ten of hospitals with the greatest scores, there were nine non-university hospitals but only one university hospital. In the three domains of the PHEEM, the mean scores for degree of independent learning and quality of educational programs were significantly higher for non-university hospitals. The mean score for social support did not differ significantly between the two types of hospitals.

Conclusions: The difference in educational environment may explain the greater satisfaction of non-university residents in Japan and account for the massive shift

of residents from university to non-university hospitals after introduction of the new postgraduate medical education program in Japan.

Key Words: educational environment; postgraduate medical education; university hospital

Introduction

Between 2003 and 2004, when the new postgraduate medical education (PGME) program was introduced in Japan, the number of university residents decreased by about 30%, while the number of non-university residents increased by about 45% (1-3). Despite a larger hospital size, abundant teaching resources, and free access to international medical journals in university hospitals, our previous self-reported survey of residents suggested that university residents were more dissatisfied with multiple aspects of university hospitals, including daily chores, low salary, and poor clinical opportunities (4). Differences in the levels of satisfaction of residents were probably a major cause of the massive shift of residents from university to non-university hospitals (4, 5). The PGME has been combined with the computerized Match system, in which graduating students are allowed freer choice for programs that they liked better.

After the introduction of the PGME program, a critical shortage of physicians in university hospitals has emerged due to the exodus of residents from these hospitals (2, 6). Consequently, university hospitals have had to pull physicians out of community hospitals, leading to a decrease in physician numbers in these small to medium-sized hospitals; this phenomenon is referred to as "Iryou-houkai", the collapse of community hospitals. Leaders in university hospitals are struggling to attract residents back to their hospitals, and research is needed into the causes of the shift of residents and especially the root cause of resident dissatisfaction in university hospitals (6).

The satisfaction level of residents depends on their engagement and

motivation, which is mostly affected by the educational environment in a teaching hospital (7). Greater dissatisfaction of university residents, as shown in our previous survey, may reflect a poor educational environment in university hospitals. Thus, in the current study, we compared the educational environments of university and non-university hospitals using the Postgraduate Hospital Educational Environment Measure (PHEEM), which is a reliable and validated instrument for evaluation of the educational environment of a teaching hospital (8-12). Leaders in university hospitals may be able to use our findings for evaluating and improving the educational environment in their hospital.

Methods

Subjects

In November 2008, a cross-sectional survey was administered to all 6725 1st-year resident physicians at 427 teaching hospitals with five or more 1st-year resident physicians throughout Japan. The program director at each hospital was asked to encourage residents to complete the self-administered questionnaire. As the academic calendar in Japan starts on April 1 and ends on March 31 of the following year, the survey was conducted at the midpoint (November) of the 2008 academic year. We obtained ethical approval of the study from the institutional review board of St. Luke's International Hospital in Tokyo, Japan.

Survey

The survey data included the demographics of the residents and the scores

on the PHEEM inventory, which was used to obtain each resident's evaluation of the educational environment of their hospital. The earlier Japanese version of the PHEEM was developed by Nishigori et al (13, 14). The original British version of the PHEEM is in the public domain and was translated forward and backward by native-English speakers and native Japanese speakers, respectively, for development of a version for this study, the item translation of which was similar to that of the earlier version (13). The PHEEM inventory consists of 40 items, each of which are scored from 0 to 4 on a Likert scale, giving a maximum score of 160 and a minimum score of zero; higher scores indicate a better educational environment (8). The three domains of the PHEEM include the degree of independent learning (14 items; score, 0–56), quality of educational programs (15 items; 0-60), and social support (11 items; 0-44).

Statistical Analysis

The mean total scores and the scores for the three domains of the PHEEM were compared between residents at university and non-university hospitals using a Student t-test. All statistical analyses were conducted using SPSS 15.0J (Tokyo, Japan). A two-tailed $p<0.05$ was considered statistically significant.

Results

A total of 2429 PGY-1 physicians-in-training (927 women, 38%) completed the questionnaire (response rate, 36%). The distributions of the mean total scores for the PHEEM in 80 University hospitals and 255 non-university hospitals

are shown in Figure 1. The mean PHEEM score was significantly higher for non-university hospitals than for university hospitals (t-statistic=3.38, p=0.001).

Among the 80 university hospitals, the mean PHEEM scores ranged from 77 to 125 (mean ± SD, 99 ± 20). Hirosaki University Hospital had the highest score (125), followed by Osaka Medical College Hospital (120) and Kagawa University Hospital (118). Among the 255 non-university hospitals, the mean PHEEM scores ranged from 46 to 149 (mean ± SD, 102 ± 21). Otowa Hospital had the highest score (149). List of the top ten of hospitals with the greatest scores is shown in Table 1. Among these 10 hospitals, there were nine non-university hospitals but only one university hospital.

For the three domains of the PHEEM, the mean score for the degree of independent learning was significantly higher for non-university hospitals compared to university hospitals (34.1 vs. 33.2, t-statistic=2.93, p=0.003). Similarly, the mean score for the quality of educational programs was also significantly higher for non-university hospitals (38.4 vs. 37.6, t-statistic=2.07, p=0.036). However, the mean score for social support did not differ significantly between non-university and university hospitals (29.5 vs. 29.4, t-statistic=0.60, p=0.55). The distributions of the total scores for these three domains of the PHEEM in 80 University hospitals and 255 non-university hospitals are shown in Figure 2-4.

Discussion

Our results suggest that the educational environment under the new PGME

program differs significantly between university and non-university hospitals, since the two domains of the PHEEM addressing the degree of independent learning and the quality of educational programs were scored higher by residents in non-university hospitals. These findings may explain the massive shift of residents from university to non-university hospitals after introduction of the PGME program in Japan, since the educational environment in a teaching hospital is likely to determine the engagement and motivation of residents and lead to greater satisfaction (7).

The Association of Japanese Medical Colleges (AJMC) recently emphasized the importance of increasing the teaching budget at university hospitals in order to increase the number of university residents, which is required to reverse the collapse of medical services in some communities and the stagnation in medical research. Our results indicate that these increased resources might best be used in efforts to improve the educational environment, especially enhancement of independent learning and quality of educational programs (6). Merely increasing the teaching budget at university hospitals may not increase the levels of engagement and motivation for learning among residents or improve their satisfaction and clinical achievements unless these areas are specifically addressed.

Residents at non-university hospitals may have a greater opportunity to see patients with various health problems, since there are many more patients with common diseases and acute illnesses at non-university hospitals (4). This characteristic of non-university hospitals is better consistent with the learning

goals set by the Ministry of Health, Labor and Welfare of Japan for being able to care for patients with primary care levels and those who need urgent care. The increased clinical experience with a higher degree of independence is likely to lead to increased satisfaction among residents at non-university hospitals. In addition, despite the smaller number of teaching staff at non-university hospitals than at university hospitals, they may have greater enthusiasm for teaching residents, since some teaching staff at non-university hospitals are likely to have greater clinical competency and teaching skills than those at university hospitals (15, 16). A higher quality of educational programs offered by skilled clinical teachers at non-university hospitals may be a cause of the increased satisfaction among residents at these hospitals.

The highest mean total score for the PHEEM (149) was achieved by Otowa Hospital, Kyoto. Similarly to several other popular non-university teaching hospitals, such as Okinawa Chubu Hospital, St. Luke's International Hospital and Teine Keijinkai Hospital, this hospital is well known for having introduced a US-style teaching program through collaboration with invited US teaching faculty and with the Department of Medicine (General Internal Medicine) established as a major teaching department. These trends are seldom observed at university hospitals (15, 17). In some university hospitals, Departments of General Medicine or Family Medicine have been established, but the major role of these departments is currently considered to be teaching of medical students, not residents because of the inadequate support to these departments from other subspecialty departments in university hospitals.

There are several limitations in our study. First, our results might have been influenced by sampling bias. The response rate was relatively low. This may have been due to residents being unavailable, as many go for clinical training outside their own hospitals (i.e., visits to public health centers or to affiliated small local hospitals). In addition, because the number of residents per hospital is smaller and the workload is greater at non-university hospitals, these residents may not have had time to respond. The response rate was relatively lower from these programs compared to university programs. Second, we only investigated the residents perception of the educational environment and not the number of patients treated by residents and the quality of the hospital teaching staff. Therefore, we cannot assess the differences in these aspects of university and non-university hospitals. Finally, because of the cross-sectional study design, causality cannot be determined and thus the results require careful interpretation.

Within these limitations, we conclude that the educational environment at non-university hospitals is generally better than that in university hospitals, and we suggest that this difference may explain the massive shift of residents from university to non-university programs once more freedom of choice was introduced into the matching program. More specifically, the degree of independent learning and quality of educational programs were better in non-university hospitals. Thus, university hospitals particularly need to improve these aspects of their educational environment to attract better residents.

Acknowledgments

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Conflict of Interest

None of the authors have a conflict of interest regarding the work in the study.

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Figure Legends

Figure 1. Histograms of mean total PHEEM scores for 80 university hospitals and 255 non-university hospitals

Figure 2. Histograms of mean total scores of degree of independent learning for 80 university hospitals and 255 non-university hospitals

Figure 3. Histograms of mean total scores of quality of educational program for 80 university hospitals and 255 non-university hospitals

Figure 4. Histograms of mean total scores of social support for 80 university hospitals and 255 non-university hospitals

Table

Table 1. List of the top ten teaching hospitals by the greatest scores of the PHEEM

Rank	PHEEM score	Hospital	Type of hospital
1	149	Otowa Hospital	Non-university
2	140	Minoh City Hospital	Non-university
3	131	Kanmon Medical Center	Non-university
4	131	Kagoshima Seikyo Hospital	Non-university
5	130	Tokyo Rosai Hospital	Non-university
6	128	Fujisawa Shonandai Hospital	Non-university
7	127	Urasoe Sougou Hospital	Non-university
8	126	Okinawa Hokubu Hospital	Non-university
9	125	Hirosaki University Hospital	University
10	124	Kinikyou Chuo Hospital	Non-university

Figure 1

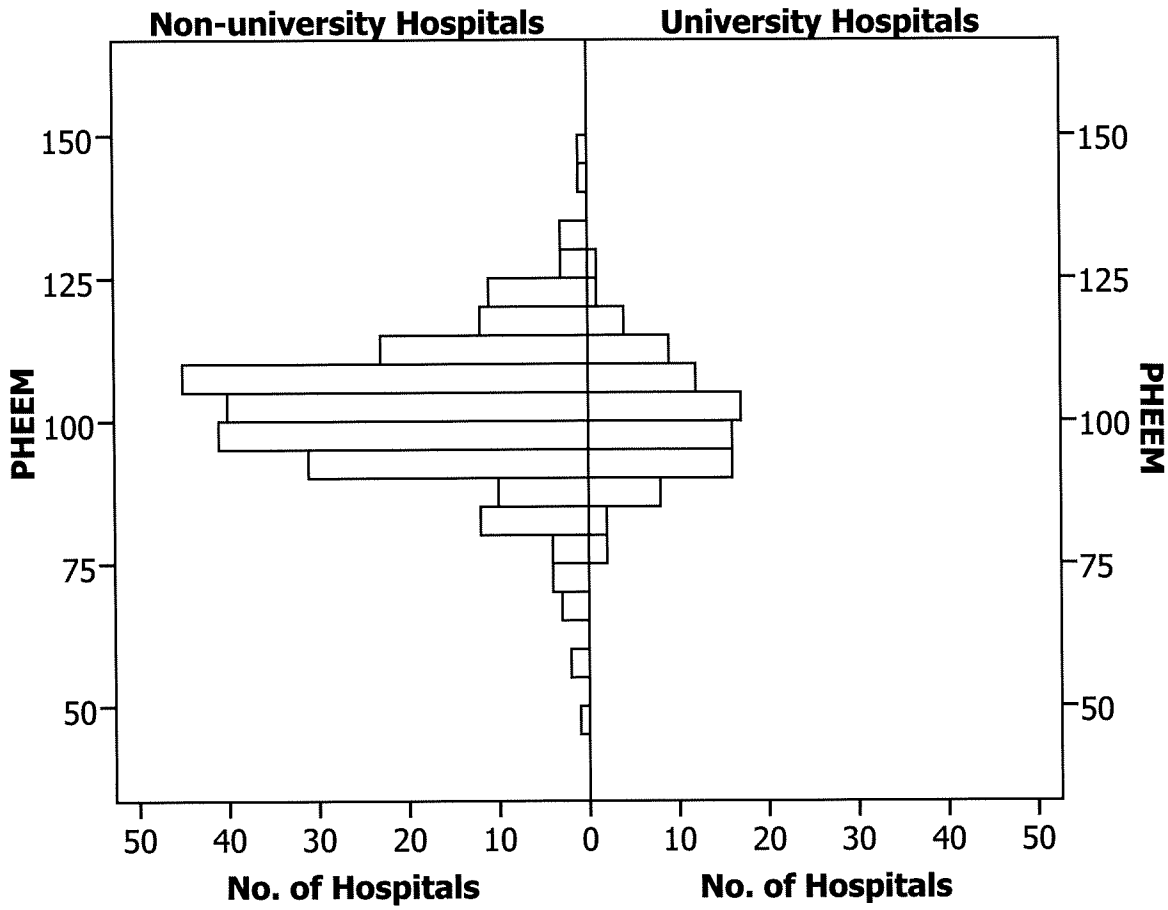

Non-university Hospitals
University Hospitals
PHEEM
150
125
100
75
50
50 40 30 20 10 0 10 20 30 40 50
No. of Hospitals
No. of Hospitals

Figure 2

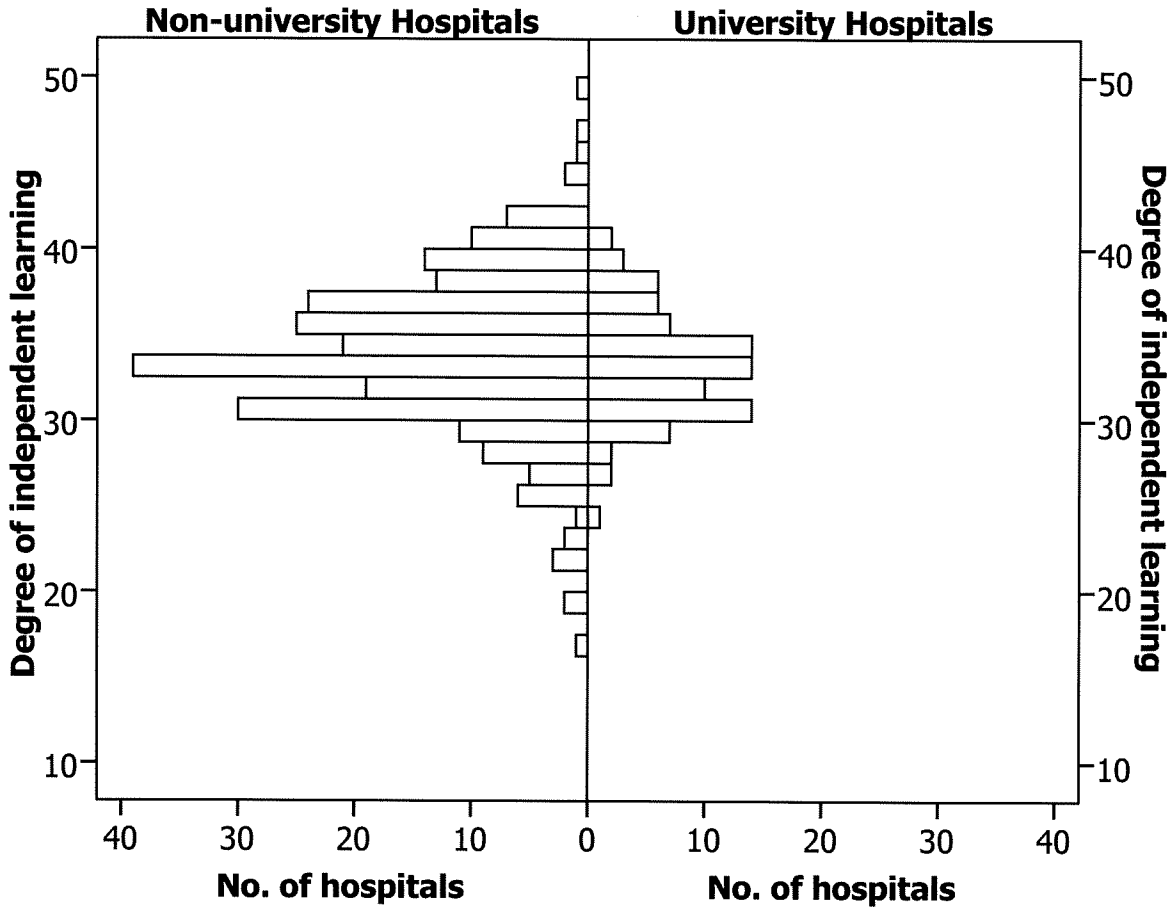

Non-university Hospitals
University Hospitals
Degree of independent learning
50
40
30
20
10
40
30
20
10
0
10
20
30
40
No. of hospitals
No. of hospitals

Figure 3

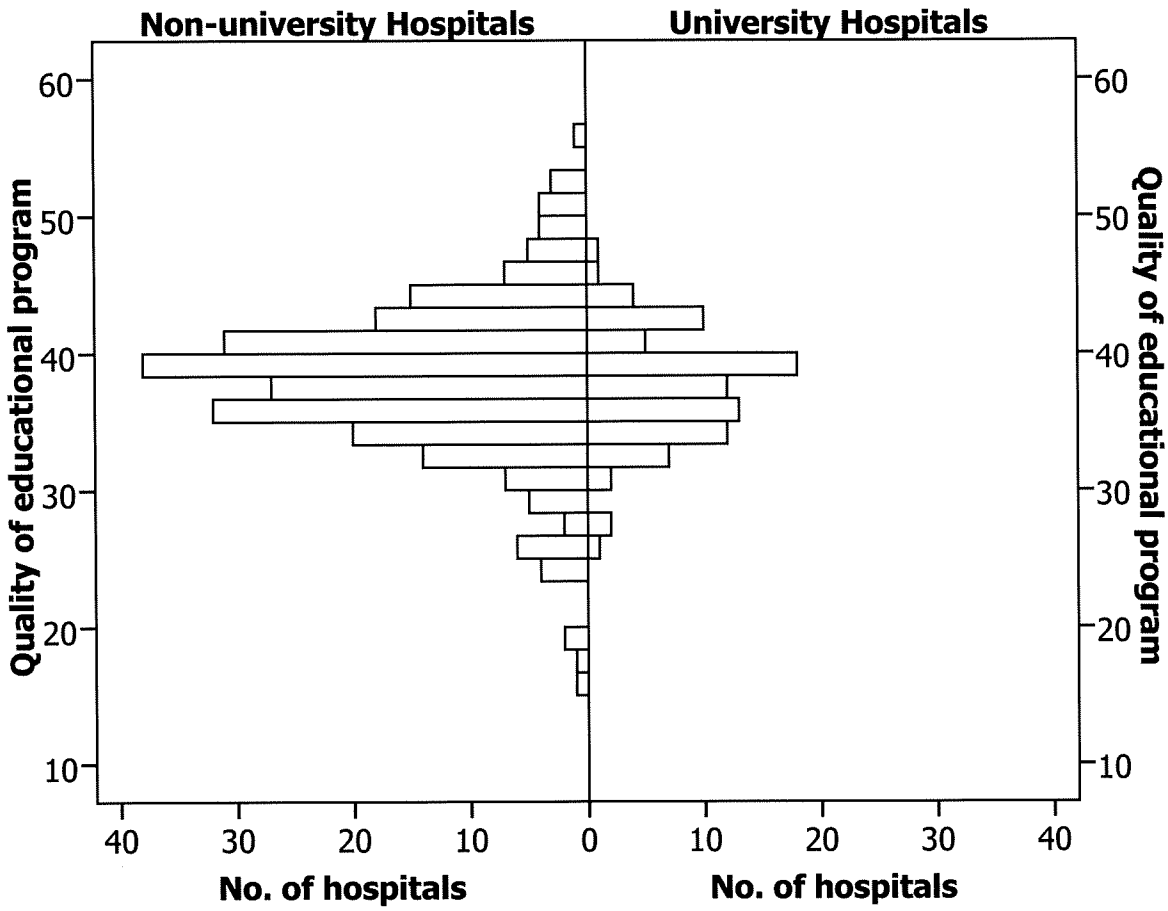
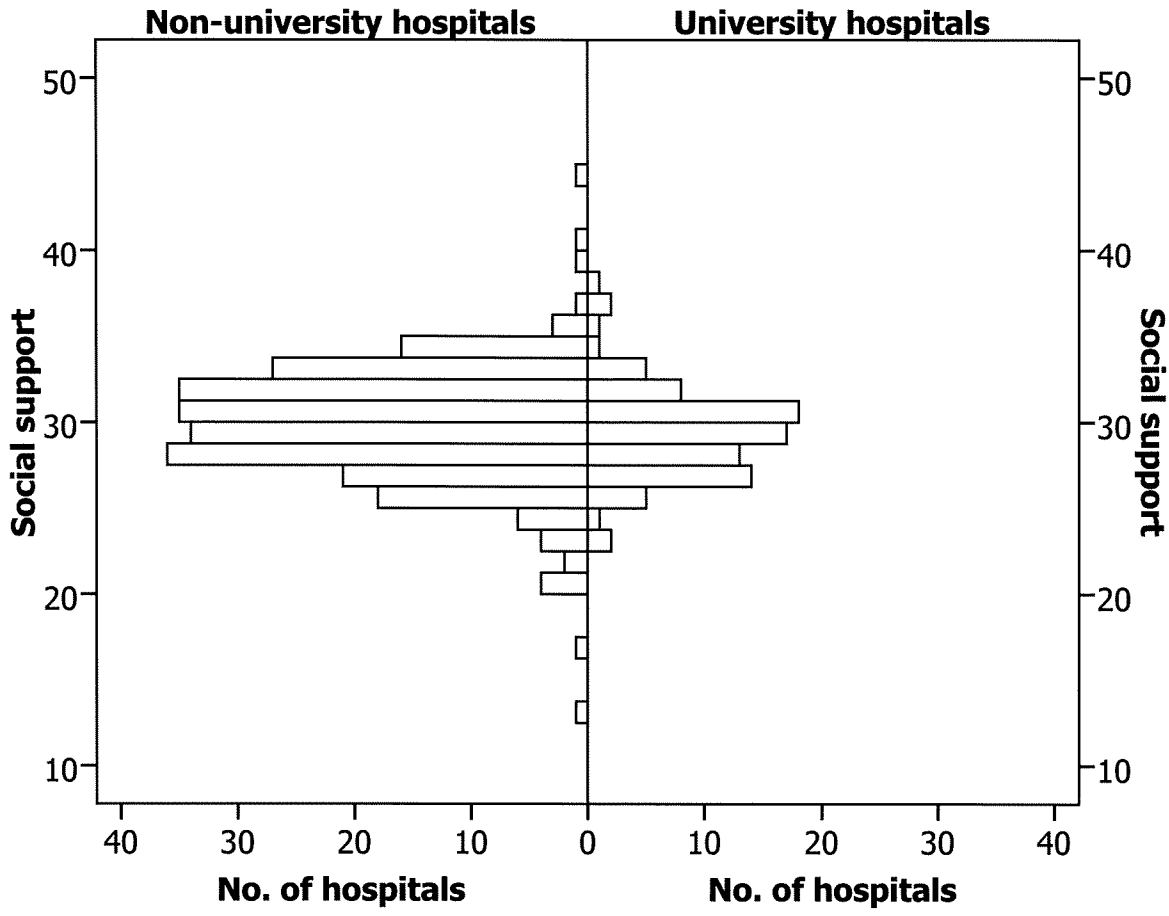

Non-university Hospitals
University Hospitals
Quality of educational program
Quality of educational program
60
50
40
30
20
10
40
30
20
10
0
10
20
30
40
No. of hospitals
No. of hospitals

Figure 4


Non-university hospitals
University hospitals
Social support
50
40
30
20
10
40
30
20
10
0
10
20
30
40
No. of hospitals
No. of hospitals

4. 日本の新しい卒後医学教育プログラムの救急医療におけるケアの質への影響

Effects of the New Japanese Postgraduate Medical Education Program on Quality of Emergency Medical Care

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Running head: **Education Program and Quality of Emergency Care**

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Abstract

Objectives: To compare the quality of care and confidence in provision of emergency medicine between physicians who completed the old and new Postgraduate Medical Education (PGME) programs.

Methods: A cross-sectional survey was sent to 279 physicians of postgraduate years 4-9, and 208 responses (75%) were received. Quality of care in emergency medicine was measured using 26 questions on treatment choices for various clinical conditions. Each question had six responses, including a single correct choice. Effect size was obtained by dividing the total difference in score by the standard deviation of the score distribution. Confidence in emergency medicine was rated using four self-reported items on the level of confidence in treating acute illnesses in various emergency medicine settings.

Results: The mean score for quality of care was significantly higher in the new PGME group (15.3) compared to the old PGME group (12.8). The difference in scores was 2.5 ($p<0.01$) and the effect size (0.47) indicated a moderate difference. Linear regression of total scores adjusted for physician covariates produced similar results of an adjusted score difference of 2.5 ($p<0.01$) and an adjusted effect size of 0.47. The new PGME group also had significantly greater confidence in provision of emergency medicine based on significant differences between the groups for all four self-reported items (all $p<0.05$).

Conclusions: Japanese physicians who complete the new PGME program are likely to provide higher quality of care and have greater confidence in emergency medicine compared to those who completed the old PGME program.