

Original Article

Residency and career satisfaction among Anglo-American model emergency medicine residents in Japan

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Aim: The number of institutions providing Anglo-American model emergency medicine has increased with the rise in its social demand in Japan. The ER Committee of the Japanese Association for Acute Medicine has introduced a residency model for use in Japanese hospitals that have adopted the Anglo-American emergency medicine model. Despite the critical importance of its quality, no studies have examined Japanese emergency medicine residents' level of satisfaction with their training. This study investigated their residency and career satisfaction, and factors associated with satisfaction.

Methods: We developed a cross-sectional, anonymous survey. Data were obtained from 67 Anglo-American model emergency medicine residents in Japan in February 2010. Data were analyzed with factor analysis and multivariable analysis with a logistic regression model.

Results: Response rate was 100% ($n = 67$). Overall, 50.7% and 67.2% of residents reported high residency and career satisfaction, respectively. Factor analysis derived four factors: working conditions; stress reduction; training systems; education. Logistic regression analysis revealed that the training system factor was significantly associated with high residency satisfaction (odds ratio [OR], 2.9; 95% confidence interval [CI], 1.2–8.4) and the stress reduction factor was significantly associated with high career satisfaction (OR, 3.0; 95%CI, 1.2–8.4). A total of 28.8% reported intentions to switch specialties. The intention was not significantly associated with low residency satisfaction (OR, 1.7; 95%CI, 0.6–5.0), but was associated with low career satisfaction (OR, 5.1; 95%CI, 1.6–16.0).

Conclusion: Improvements in training systems and stress reduction may increase residency and career satisfaction of emergency medicine residents, respectively. This study suggested that high career satisfaction was required to secure future emergency physicians.

Key words: Education, factor analysis, residency program, stress, training system

BACKGROUND AND OBJECTIVES

IN RECENT YEARS, the number of institutions providing Anglo-American model emergency medicine has increased in Japan with rising social demand. The ER Committee of the Japanese Association for Acute Medicine has outlined the specific clinical skills to be provided by residency training programs to Anglo-American model emergency medicine residents.¹ However, no studies have investigated the standardization of residency training programs between hospitals. Furthermore, although specific

issues regarding the content and quality of training have been presented at the Annual Meeting of the Japanese Association for Acute Medicine, no published reports have described the actual state of emergency medicine postgraduate training in Japan, such as resident satisfaction and the problems faced by the residents. In this context, we aimed to investigate both the residency and career satisfaction experienced by Anglo-American model emergency medicine residents and the factors associated with their satisfaction.

SUBJECTS AND METHODS

Definition of terms

THE TERMS USED in this study are defined below and have previously been reported.^{2,3} The following criteria were used for inclusion and exclusion of subjects.

For the purpose of the study, “Anglo-American model emergency medicine” was defined by the emergency care

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model practiced by emergency physicians in which all patients visiting an emergency department are cared for regardless of the severity or organ specialization of the patient. “Emergency physician” was defined as a physician engaged in work entirely or mostly involving the practice, training, management, and study of emergency medicine. Transitional year residents (Doc. S1)—postgraduate year 1 and 2 residents—were not counted as emergency physicians. “Anglo-American model emergency medicine residents” were defined as physicians primarily engaged in the practice, training, and study of Anglo-American model emergency medicine. Anglo-American model emergency medicine residents were included in emergency physicians. Postgraduate year 1 and 2 residents were excluded from these groups.

Study design

This cross-sectional study was carried out in February 2010. We collected data on 33 emergency medicine residents at 10 institutions in Japan: Aizawa Hospital (Nagano); Okinawa Prefectural Chubu Hospital (Okinawa); Kumamoto Red Cross Hospital (Kumamoto); National Center for Global Health and Medicine (Tokyo); Shonan Kamakura General Hospital (Kanagawa); Toyota Memorial Hospital (Aichi); Nagoya Ekisaikai Hospital (Aichi); Fukui Prefectural Hospital (Fukui); University of Fukui Hospital (Fukui); and Niigata City General Hospital (Niigata). The questionnaires were distributed to representatives at each institution.

In addition, the questionnaires were provided to all physicians attending the First Annual EM Alliance Meeting held at Nagoya Ekisaikai Hospital on 13 February, 2010. The EM Alliance comprises a network of physicians engaged in Anglo-American model emergency medical care and was established in October 2009 for exchanging ideas, providing training, and conducting research (<http://www.emalliance.org/wp/>).

Taken together, 118 residents were involved in the questionnaire.

Questionnaire

We created a questionnaire on residency and career satisfaction for anonymous completion by emergency medicine residents. The questionnaire was divided into three sections (Table 1). Section A covered basic demographics and comprised 13 core items designed to determine respondent attributes. Section B had a further 28 items covering satisfaction, which were answered on a 1–5-point Likert scale. Section C included four questions. Two were regarding overall satisfaction with both residency and career; the final two dichotomous questions were: “Knowing what you know now, if you

had to decide whether to select the specialty of emergency medicine, would you decide emergency medicine?” and “Would you switch specialty?”.

Statistical analysis

We carried out factor analyses to extract factors associated with residency and career satisfaction. We verified the presence of ceiling and floor effects from the descriptive statistics of the questionnaire items and extracted factors using the maximum likelihood method (MLM) and Promax rotation (PR) after excluding those where effects were observed in the subjects analyzed. Subscale scores for these factors were designated explanatory variables, and answers with high satisfaction scores of 4 or 5 points were designated response variables. Logistic regression analysis was then carried out with these variables. The χ^2 -test was used with high satisfaction scores and questions 3 and 4 in section C (Table 1). Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) and IBM SPSS Statistics (SPSS Inc., Chicago, IL, USA) were used for data analysis; $P < 0.05$ was regarded as statistically significant.

RESULTS

Response

THE TOTAL RESPONSE rate was 100% (118 of 118 individuals), with an overall valid response rate of 97.5% (115 individuals). More specifically, the response rate was 100% for the 33 emergency medicine residents at 10 institutions; the rate was 95.6% (82 of 85) for conference attendees. Among the 85 physicians responding from the First Annual EM Alliance Meeting, 34 were defined as emergency medicine residents according to our protocol. Taken together, the final study population consisted of 67 individuals from 22 different institutions. Figure 1 provides a flow chart of the study population.

Demographics

The majority of responders were men ($n = 57$, 85.1%). The mean age was 30.1 years (standard deviation, 3.2). The mean years in practice was 4.9 years; the mean years in the practice of emergency medicine was 2.2 years. Table 2 summarizes the data. Table 3 shows the mean scores and standard deviation of the 28 residency and career satisfaction items from section B of the questionnaire.

Factor analysis

We checked ceiling effects and floor effects before factor analysis. Question B-12, “Is this work condition available

Table 1. Survey of residency and career satisfaction experienced by Anglo-American model emergency medicine residents in Japan**A. Demographics**

1. Sex
2. Age
3. Practicing hospital
4. Years in practice
5. Years in practice of emergency medicine
6. Qualification
7. Current style of practice
8. Shifting labor
9. Number of patient visits in emergency department per year
10. Number of ambulance visits per year
11. Number of emergency physicians (attending physicians)
12. Number of emergency medicine residents
13. Work hours per week (excluding moonlighting)
14. Income from emergency medicine (excluding moonlighting)
15. Present marital status
16. I have a child/children

The answer choices for questions B-1 to B-28 and C-1 to C-2 were presented in a Likert-like scale and ranged from 1 (lowest grade) to 5 (highest grade).

B. Satisfaction

1. Are you satisfied with your income?
2. How high is the level of fatigue?
3. Are you satisfied with your personal time?
4. Are you satisfied with knowing enough?
5. Are you satisfied with improvement of skill and knowledge through practice?
6. Are you satisfied with opportunities to attend conferences?
7. Are you satisfied with keeping up with medical literature?
8. Is your residency program organized enough?
9. Are you satisfied with the number of attending physicians?
10. Are you satisfied with bedside education by attending physicians?
11. Are you satisfied with measures of clinical problem solving?
12. Is this work condition available in my current position: Teaching opportunity
13. Is this work condition available in my current position: Research opportunity
14. Is this work condition available in my current position: Administrative opportunity
15. Is this work condition available in my current position: Opportunity for subspecialization
16. Do you think of emergency medicine is one of the specialties?
17. Do you have role models?
18. Are you satisfied with subspecialty support?
19. Are you satisfied with hospital administrators?
20. Are you satisfied with emergency department administrators?
21. Are you satisfied with patient volume?
22. Are you satisfied with working hours?
23. Is this work condition available in my current position: Defined working hours
24. How much are you concerned about medical malpractice suits?
25. How high is the level of stress with patients and their families?
26. How high is the level of subspecialty support?
27. How high is the level of stress with co-medicals?
28. How high is the level of overall stress?

C. General Questions

1. Overall, how satisfied are you with your career in emergency medicine?
2. Overall, how satisfied are you with your emergency medicine residency training?
3. If you had to decide whether to select the specialty of emergency medicine, what would you decide? (Yes or No)
4. Would you switch the specialty? (Yes or No)

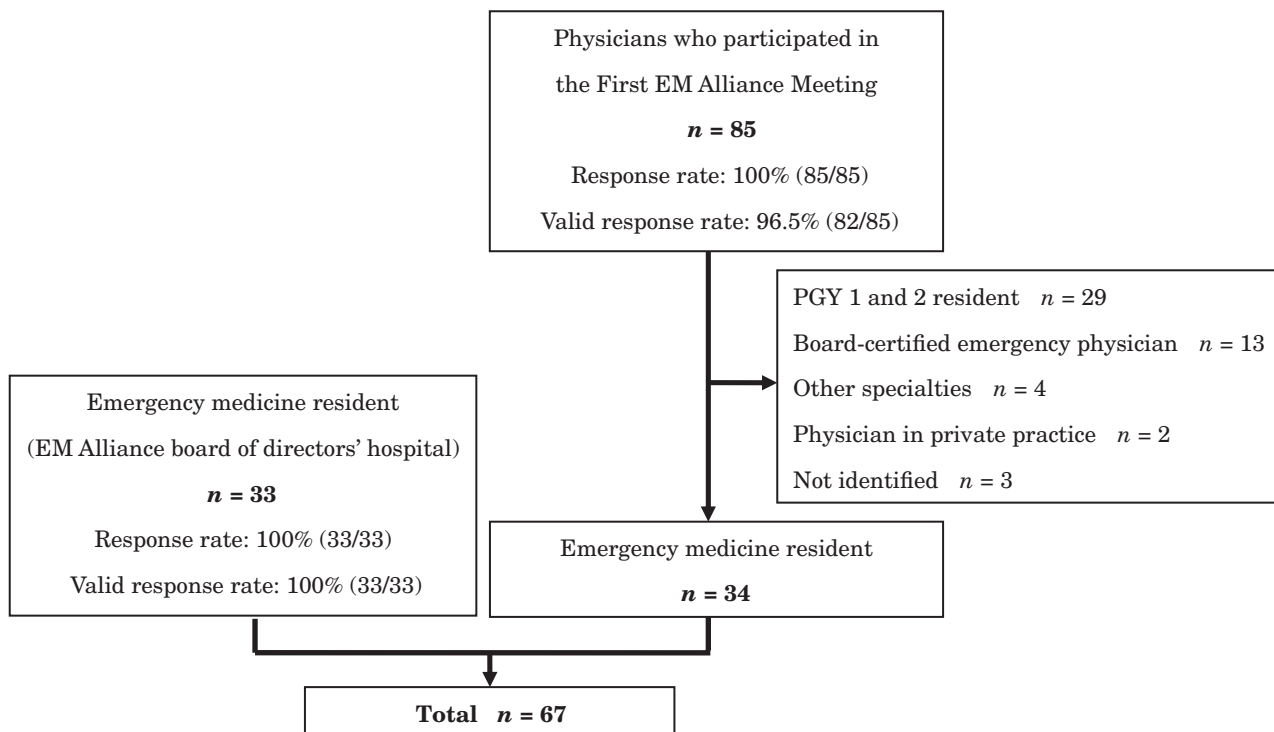


Fig. 1. Flowchart of the emergency medicine residents who were enrolled in this study. Data were collected in February 2010 from all emergency medicine residents from 10 institutions with which the board of directors of the EM Alliance were affiliated, and from all physicians who participated in the first EM Alliance Meeting. Emergency medicine residents who met our selection criteria were all residents from the former and 33 residents from the latter. PGY, postgraduate year.

in my current position: Teaching opportunity”, exhibited a ceiling effect; therefore, this item was excluded from analysis. No floor effect was observed for any items. Results of factor analysis carried out with MLM revealed eigenvalue changes of 5.88, 2.76, 2.28, 2.04, and 1.67. A four-factor structure was considered valid on the basis of the state of eigenvalue attenuation and possibilities for interpretation. Thus, factor analysis was carried out once again with MLM and PR, assuming the existence of four factors. As a result, we excluded seven items not exhibiting sufficient factor loading and repeated factor analysis with MLM and PR. Table 4 shows the final factor pattern and factor loading following PR. In addition, the percentage explaining the total variance of the 27 items was 48.0% for the four factors before rotation. The first factor comprised six items, including “adhering to shift work,” “ensuring private time,” “sufficient income,” and “opportunities to participate in conferences.” Items pertaining to work environment, such as working hours and income, had a high loading; this was designated the working condition factor. Cronbach’s alpha coefficient was 0.81 with valid reliability. The second factor comprised six items, and a high loading

existed with those items associated with “stress” and “fatigue”. This was designated the stress reduction factor. Cronbach’s alpha coefficient was 0.78 with valid reliability. The third factor, comprising five items based on hospital hierarchy items associated with residency training, had a high loading. This was designated the training system factor. Cronbach’s alpha coefficient was 0.76 with valid reliability. The fourth factor comprised three items, and a high loading existed for items associated with “attending physician” and “education”. This was designated the education factor.

Analysis of satisfaction scores

The mean scores for satisfaction were 3.8 ± 0.9 points for career satisfaction and 3.3 ± 1.1 points for residency satisfaction, with 45 individuals (67.2%) and 34 individuals (50.7%) claiming high satisfaction, respectively (Table 5). Logistic regression analysis demonstrated a significant association between career satisfaction and the stress reduction factor ($P = 0.026$; odds ratio [OR], 3.0; 95% confidence interval [CI], 1.2–8.6). We also found a significant association between residency satisfaction and the training system

Table 2. Demographics of survey respondents, Anglo-American model emergency medicine residents in Japan

Sex, male (%)		57 (85.1%)
Average age, years (range)		30 (28–31)
Years in practice	3 years	16 (23.9%)
	4 years	17 (25.4%)
	5 years	20 (29.9%)
	6 years	10 (14.9%)
	7 years and above	4 (6.0%)
Years in practice of emergency medicine	Within 3 years	57 (85.1%)
	4 years and above without board certification	10 (14.9%)
Current style of practice	ED only	33 (49.3%)
	ED and inpatient ward	6 (9.0%)
	ED and critical care unit	2 (3.0%)
	ED, critical care unit, and inpatient ward	23 (34.3%)
	ED, critical care unit, inpatient ward and surgery	3 (4.5%)
Shifting labor	Shift work	53 (79.1%)
	Non-shift work	14 (20.9%)
Number of patient visits in ED per year	<30,000	10 (14.9%)
	30,000–50,000	39 (58.2%)
	50,000–70,000	17 (25.4%)
	>70,000	1 (1.5%)
Number of emergency physicians	≤3	13 (19.7%)
	3–6	29 (43.9%)
	≥6	24 (36.4%)
Number of emergency medicine residents	≤3	14 (20.9%)
	3–6	16 (23.9%)
	6–11	37 (55.2%)
	<60	22 (32.8%)
Work hours per week	60–80	35 (52.2%)
	80–100	6 (9.0%)
	>100	2 (3.0%)
	Income from emergency medicine per month (¥)	300,000–400,000
400,001–500,000		20 (29.9%)
500,001–1,000,000		24 (36.4%)
Married		27 (41.0%)
I have a child/children (Yes)		13 (19.7%)

ED, emergency department, a section of an institution that is staffed and equipped to provide emergency care and that excludes inpatient management.

factor ($P = 0.029$; OR, 2.9; 95% CI, 1.2–8.4). Similarly, the stress reduction factor ($P = 0.076$; OR, 2.5; 95% CI, 0.94–7.7) and the education factor ($P = 0.078$; OR, 1.9; 95% CI, 0.96–4.2) was significant (Table 6). Furthermore, univariate analysis of high satisfaction with each attribute was carried out to investigate how the respondent attributes shown in Table 1 affected satisfaction. Only “marital status” was significant (residency satisfaction, $P = 0.049$; career satisfaction, $P = 0.018$), with a high level of satisfaction difficult to achieve if married.

Nineteen residents (28.8%) were considering changing their specialty. Using the χ^2 -test, we found an association between a lower level of career satisfaction and an intention to change specialty ($P = 0.004$; OR, 5.1; 95% CI, 1.6–16.0). No significant differences existed with high levels of residency satisfaction and intentions to switch specialty ($P = 0.33$; OR, 1.7; 95% CI, 0.6–5.0) (Table 7). Furthermore, only five individuals (7.5%) responded that they would not choose to be an emergency physician; no statistical analysis of satisfaction was carried out.

Table 3. Mean and standard deviation (SD) of survey questions B-1 to B-28

Question	Mean	SD	Question	Mean	SD	Question	Mean	SD
1	2.99	0.91	11	3.27	1.14	21	3.25	0.97
2	2.79	0.93	12	4.22	0.79	22	3.55	1.02
3	3.18	1.11	13	2.43	1.17	23	3.54	0.88
4	2.34	0.81	14	3.18	1.15	24	3.24	0.80
5	2.72	0.79	15	3.76	1.18	25	3.24	0.92
6	3.12	1.02	16	3.52	1.04	26	3.21	1.05
7	2.39	1.07	17	3.64	1.18	27	3.66	0.90
8	2.73	1.05	18	3.94	0.81	28	3.15	0.89
9	2.96	1.35	19	3.52	1.09			
10	2.78	1.15	20	3.51	1.06			

Table 4. Pattern matrix of survey questions after Promax rotation

	Factors			
	1	2	3	4
23. Availability of defined work hours	0.928	-0.123	0.109	-0.115
3. Satisfaction with time for personal life	0.815	0.055	-0.183	-0.041
22. Satisfaction with shift work	0.718	-0.042	0.293	-0.096
1. Satisfaction with income	0.505	0.025	-0.096	0.144
6. Opportunity for participation in conferences	0.456	0.052	-0.093	0.259
7. Opportunity to keep up with medical literature	0.380	0.079	-0.196	0.343
26. Stress associated with other specialties	-0.098	0.914	0.074	-0.044
28. Overall stress	0.088	0.697	0.088	0.019
27. Stress associated with co-medical personnel	0.110	0.565	0.015	-0.053
14. Administrative opportunity	-0.163	0.544	-0.200	0.079
25. Stress associated with patients/families	0.247	0.444	-0.007	0.009
2. Fatigue	0.337	0.395	0.001	-0.065
20. Satisfaction in administration of emergency department	-0.065	-0.205	0.892	0.082
19. Satisfaction in emergency system of institution	0.015	0.071	0.717	0.010
18. Support from other specialties	-0.133	0.314	0.496	-0.038
17. Presence of role models	0.172	0.074	0.368	0.234
8. Satisfaction with curriculum	-0.033	-0.067	0.332	0.289
10. Satisfaction with education by attending physicians	-0.099	-0.025	0.083	0.826
9. Satisfaction with number of attending physicians	0.178	-0.106	-0.002	0.806
11. Satisfaction with educational environment	-0.057	0.178	0.203	0.553

Table 5. Results of career and residency satisfaction survey of Japanese emergency medicine residents employed in institutions following the Anglo-American emergency medicine model

	Mean	SD	High satisfaction, [†] n (%)
Career satisfaction	3.84	0.85	45 (67.2)
Residency satisfaction	3.33	1.06	34 (50.7)

[†]Rated as 4 or 5 out of 5 by survey respondents.

Table 6. Logistic regression analysis for career and residency satisfaction in Japanese emergency medicine residents employed in institutions following the Anglo-American emergency medicine model

Career satisfaction	β	χ^2	P-value	Odds ratio	95% confidence interval
Working condition factor	0.375	0.510	0.476	1.455	0.522–4.296
Stress reduction factor	1.106	4.980	0.026*	3.022	1.203–8.645
Training system factor	0.740	2.090	0.148	2.096	0.786–6.030
Education factor	–0.050	0.020	0.890	0.951	0.463–1.966
Residency satisfaction	β	χ^2	P-value	Odds ratio	95% confidence interval
Working condition factor	0.038	0.010	0.942	1.039	0.361–2.902
Stress reduction factor	0.933	3.150	0.076	2.542	0.944–7.701
Training system factor	1.074	4.770	0.029*	2.926	1.176–8.396
Education factor	0.649	3.110	0.078	1.914	0.965–4.199

* $P < 0.05$.**Table 7.** Cross-tabulation of satisfaction and intention of switching to other specialties in Japanese emergency medicine residents employed in institutions following the Anglo-American emergency medicine model

		Intention of switching to other specialties		Total
		Yes	No	
Career satisfaction (high)	+	8	37	45
	–	11	10	21
Total		19	47	66

 χ^2 -test, $P = 0.004$. Odds ratio, 5.088; 95% confidence interval, 1.614–16.032.

		Intention of switching to other specialties		Total
		Yes	No	
Residency satisfaction (high)	+	8	26	34
	–	11	21	32
Total		19	47	66

 χ^2 -test, $P = 0.330$. Odds ratio, 1.702; 95% confidence interval, 0.580–5.000.

DISCUSSION

TO OUR KNOWLEDGE, this is the first study to investigate satisfaction with residency training and work among emergency medicine residents in Japan. Previous studies have examined career satisfaction among hospitalists⁴ as well as internists;⁵ however, none has focused on emergency residents in Japan. This study examined 67 emergency medicine residents using a questionnaire. In a survey conducted in 2007,² it was estimated that there were over 415 emergency physicians and 112 emergency medicine residents enrolled in Anglo-American model emergency medi-

cine residency programs in Japan. The absolute number of emergency medicine residents remains small; therefore, the number of Anglo-American model emergency medicine residents studied in our investigation was relatively high.

We found that the residents with high levels of career satisfaction were less likely to have an intention to change their specialty ($P < 0.01$). In contrast, we observed no significant association with a high residency satisfaction and the intention to change specialty ($P = 0.33$), suggesting that residency satisfaction in the absence of career satisfaction may lead residents to gravitate away from emergency medicine. Studies in the USA have revealed that physicians with

lower career satisfaction tend to retire earlier in their career;^{6–11} Landon *et al.*¹¹ demonstrated that this tends to be two or three times more likely than in those with a higher career satisfaction. Thus, improving career satisfaction appears to be an important issue for the continuing emergency physician retention problem.

The stress reduction factor was a significant predictor for career satisfaction, suggesting that a low-stress working environment is important. The factor loading for “relationships with physicians from other specialties” from the stress reduction factor was found to be high (0.914). This may be due to the many stressors present, such as difficulties in obtaining consultations and disagreements in management between emergency physicians and other specialists. As the Anglo-American model of emergency medicine involves patient management in cooperation with many specialists, an environment where obtaining that support is difficult, unsurprisingly, results in susceptibility to stress and can harm career satisfaction. These issues cannot be resolved through the efforts of residents alone but require intervention through management policies and by senior administrators of emergency services in hospitals. Furthermore, the stress reduction factor was a significant factor in residency satisfaction; therefore, an improvement of this factor could be important in enhancing satisfaction.

Univariate analysis of respondent attributes indicated that marital status might affect satisfaction. Our sample size of 67 individuals was too small; consequently, we cannot claim that marital status affects satisfaction. Furthermore, only 10 female physicians (15%) were included in this study, making statistical comparisons between men and women inappropriate. In a study targeting emergency physicians by Cydulka and Korte,¹² the career satisfaction of female physicians was similar to that of male physicians. In contrast, a study by Carr *et al.*¹³ found that the satisfaction levels of female physicians with children were lower in comparison with their male counterparts. We also considered these factors, but analysis was not possible as only 3 of the 27 female residents (40.9%) were married individuals, and none had children. This may indicate that female physicians who are married and/or have children find careers in emergency care difficult. With the heightening issue of recruitment of female physicians, a study that specifically focuses on the needs of this population is sorely needed.

The present study had several potential limitations. First, as with any questionnaire survey, the reporting bias is an inherent limitation. The survey results were based on self-report, rather than behavioral consequences. The second limitation was information bias. We attempted to make the questionnaire comprehensive and as easy to answer as possible according to previous studies.^{4–6,8–13} However, it was

impossible to examine all of the subjects’ attributes and factors associated with satisfaction, resulting in the potential for confounding factors that were not measured. Furthermore, the cross-sectional design (i.e., not longitudinal) of this study limited our ability to assess a potential dynamic change in the level of satisfaction. The third limitation was the selection bias of the survey subjects. The number of institutions was limited despite the multiple participating sites, and the majority of subjects were undergoing training at appropriate institutions offering residency training in Japan. The fact that we included individuals who voluntarily attended the EM Alliance Meeting may also have led to selection bias. We assume that these results are representative of emergency medicine residents because of the high response rate and anonymity offered even with the convenience sampling. The target population, Anglo-American model emergency medicine residents in Japan, was not well known; therefore, a full survey method and a random sampling method could not be carried out. Nonetheless, we believe this study addressed a knowledge gap in the field of emergency medicine training. Further complete and longitudinal surveys carried out by the national professional organizations would be warranted.

CONCLUSIONS

OUR FINDINGS UNDERSCORE that improvement of residency training environments may enhance residency satisfaction and that reducing work-related stress may enhance career satisfaction. We showed that the higher a resident’s career satisfaction, the weaker was their intention to change specialty, suggesting that improving career satisfaction is an important element in retaining emergency physicians. This study represents a starting point for strategy planning and further research aimed at both the recruitment and retention of emergency physicians, as well as improving residency training in the future.

CONFLICT OF INTEREST

NONE.

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Doc. S1. Medical education system in Japan.