Prevalence of fatigue among postgraduate trainees in the United States and Japan

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Abstract

Background: The difference in prevalence of fatigue among postgraduate trainees between the United States and Japan is unknown.

Methods: A cross-sectional survey using Iowa Fatigue Scale was administered on postgraduate trainees in two internal medicine residency programs in New York and five postgraduate residency programs in Japan.

Results: Of the 393 trainees, 135 (34%) completed the survey. Seventy-seven (57%) were US trainees. Both fatigue (42% vs 81%) and severe fatigue (4% vs 19%) were more prevalent in Japan (P < .01). US trainees felt more productive during work hours but less fatigued.

Conclusions: Fatigue was more prevalent among postgraduate trainees in Japan.

Keywords: fatigue, medical education, medical trainees, residency

1 | INTRODUCTION

Extended work hours are known to result in fatigue and fatigue-related medical errors.1 Fatigue has been shown to affect postgraduate trainees’ performance, learning, and patient safety.2,3 Desai et al (2013) have demonstrated increased sleep duration when compliance with duty hour regulations implemented by American Council for Graduate Medical Education in 2011 is achieved,4 but the impact on patient care or trainee well-being remains controversial.5 On the contrary, Japanese postgraduate training programs are not mandated to report trainees’ work hours although Japanese government issued a guideline for work hours and standard labor act in 2005.5 In one study, Japanese postgraduate trainees reported sleeping less than 5 hours between their shifts.7 While evidence suggests simply reducing work hours cannot be a single solution to mitigate trainees’ fatigue and stress,2,8 further research is warranted on benefits and impacts of duty hour restrictions for postgraduate trainees. We hypothesized that prevalence of fatigue would be different between countries with and without strict duty hour regulations. Our study sought to investigate the difference in prevalence of fatigue between US and Japanese postgraduate trainees.

2 | METHODS

This report is a part of our cross-sectional survey study which we presented as posters elsewhere.7 We recruited two internal medicine residency programs in New York City as well as five postgraduate residency programs in Japan. We included all US postgraduate trainees in internal medicine residency programs (eg, categorical,
medicine-pediatrics, preliminary) as well as all Japanese trainees regardless of their future specialty of interest since specialty and subspecialty training in Japan typically starts after the mandatory postgraduate residency. Our site collaborators emailed a link to our anonymous survey near the end of 2015-2016 academic year; survey responses were collected between January to March 2016 for Japan (where academic year ends March 31st), and between April to June 2016 for the United States (where academic year ends June 30th). The survey asked about demographic information and 11 items on the Iowa Fatigue Scale (IFS). IFS was originally developed to measure fatigue levels in primary care patients, but has been used to measure fatigue in postgraduate trainees. IFS covers four elements including cognitive, fatigue, energy, and productivity (Supporting information). Fatigue and severe fatigue were defined by IFS ≥ 30 and IFS ≥ 40, respectively. Cronbach alfa was calculated at .79 confirming moderate internal consistency with our survey data. The survey questions were translated into Japanese by a lead author (HK) and double-checked by other Japanese authors to ensure the items were interpreted as intended.

For data analysis, independent sample t test was used to compare IFS scores between Japan and the United States. We then compared the prevalence of fatigue and severe fatigue between the two countries using chi-square test or Fisher’s exact test, as appropriate. We also performed subgroup analysis for the subgroup by (a) postgraduate year (PGY) 1 and (2) PGY2 or above (PGY2+). Significance level was set at .05. IBM SPSS, for Windows, version 24 (IBM Corp) was used for the analysis. Mount Sinai Beth Israel Institutional Review Board determined that this study was exempt from human research. All other participating institutions followed their IRB guidelines for the study approval.

3 | RESULTS

One hundred and thirty-five out of the 393 postgraduate trainees completed the survey (response rate 34%). Of 135 respondents, 77 (57%) were US trainees. Japanese respondents were younger, whereas US were more likely to be female, married or partnered, and have children when compared to their Japanese counterparts (Table 1).

Japanese respondents scored significantly higher on IFS than those from the United States (34.3 vs 28.3, P < .01). US respondents reported feeling more productive (ie, a large amount of work within a day) and mentally focused (ie, thinking speed and concentration) as compared to their Japanese counterparts (Table 2). All reported similar energy levels but Japanese PGY1s were more physically fatigued than other respondents (Table 2). 90% of the Japanese PGY-1s met criteria for fatigue; the high prevalence remained among Japanese PGY2+ (71%). In US respondents, nearly half of the US PGY-1s were fatigued (52%); fatigue was still prevalent among US PGY2+ (35%). Nearly one fourth of the Japanese PGY1s (23%) were classified as being severely fatigued. Overall, prevalence of fatigue in Japan was twice higher than that in the United States (81% vs 42%, P < .01). Furthermore, prevalence of severe fatigue in Japan was nearly five times higher than that in the United States (19% vs 4%, P = .01).

4 | DISCUSSION

Our cross-sectional study found significant differences in prevalence of fatigue and severe fatigue between Japan and the US postgraduate trainees. It is worth pointing out that the prevalence of fatigue was high in both countries (81% vs 42%). Four elements of IFS provide deeper insight into different types of fatigue in the two countries.
countries. Postgraduate trainees in both countries reported similar energy levels but Japanese trainees, especially PGY1s, were more mentally and physically fatigued although US trainees felt that they were very busy during work hours (ie, high productivity). This high productivity could potentially be due to the duty hour regulation with which trainees feel pressured to be more efficient, whereas higher prevalence of fatigue and severe fatigue in their Japanese counterparts could have resulted from sleep deprivation. It is, however, necessary to examine the relationship between sleep deprivation and fatigue before we draw any conclusions since we did not ask about sleep and work hours in our survey.

The study findings should be interpreted carefully. They are subject to limited generalizability and selection/non-response biases because of the low response rate (34%) and a limited variety of training programs. We also acknowledge a significant limitation to the validity of our survey instrument because we used the survey written in two different languages, and IFS has been infrequently used for postgraduate trainees in the past. The validity of IFS in Japanese is especially limited given the lack of validity evidence in the literature and our study. For instance, cultural differences may affect how postgraduate trainees feel about productivity. It is also warranted to adjust for any confounders such as psychiatric illnesses among respondents in the future research since we did not collect other variables such as differences in call structure, work environment, and work hours. While our study does not explain the reasons for the higher prevalence of fatigue among Japanese postgraduate trainees, it may facilitate further discussion on addressing the high prevalence of fatigue among postgraduate trainees.

5 | CONCLUSION

Our study found a significant difference in prevalence of fatigue and severe fatigue between the United States and Japan. Our findings suggest that perceived busyness during work may not necessarily lead to fatigue. Further research is necessary to address the differences in baseline characteristics and develop valid instruments to assess fatigue among medical trainees.

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CONFLICT OF INTEREST

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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