Circadian Preference and Job Satisfaction in Medical Residency

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Abstract

Objectives: There has been extensive research to support the idea of circadian preference, or the tendency of individuals to be more alert and effective in the morning (‘larks’) or in the evening (‘owls’). Given the rigors of medical residency training, and perceived lifestyle differences among specialties, circadian preference may play a role in choice of medical specialty, and subsequent job satisfaction during training. This study aims to determine the circadian preferences of residents in various specialties and correlations with specialty choice and job satisfaction.

Study design: Cross-sectional survey study.

Methods: A modified version of the Horne-Ostberg Morningness-Eveningness questionnaire was administered to 160 medical residents at a tertiary care institution. The residents represented specialties within medicine and surgery. Results of the survey were analyzed to determine correlations between circadian preference and specialty choice, as well as job satisfaction.

Results: Ten specialties within medicine and surgery were represented. The mean chronotype scores from all specialties fell within the category ‘neither morning nor evening’ type, and ranged from 46.18 to 54.76 (SD + 0.67). There was a significant difference in chronotype between emergency medicine residents and residents from anesthesiology (p=0.0007), surgery (p=0.0001), and medicine (p=0.0005). Residents in the surgical specialties trended towards morning chronotype. There was no significant correlation between chronotype and job satisfaction.

Conclusions: The results of this study may have implications for counseling medical students in their choice of specialties and for designing resident on-call schedules to align with chronotype testing.

Background

There has been extensive research to support the idea of circadian preference, or the tendency of individuals to be more alert and effective in the morning (“morning larks”) versus in the evening (“night owls”). There are several factors that contribute to this preference. Each individual has a unique timing of their circadian rhythm, as there are several vital biological actions that happen on a daily 24 hour cycle. The timing of these actions are based on genetic factors, as well as entrainment from zeitgebers—environmental cues that entrain an individual to the earth’s natural 24 hour day. These include light exposure, temperature changes, exercise schedules, eating and drinking patterns, timing of social interactions (work schedules), and pharmaceutical manipulation. However, despite variations in these zeitgebers, one’s tendency to be a morning or evening person is generally stable over long periods in life.

Given the rigors of medical residency training, and perceived lifestyle differences among specialties, circadian preference may play a role in choice of medical specialty. Research in this arena has already taken place in the emergency medicine literature, and has shown that ED residents have a tendency towards ‘eveningness’.

Additionally, given the recent research focus on resident fatigue, mistakes, and changes to duty hours, the results of study in this area could have ramifications for decision-making as far as shift length and shift timing to maximize resident efficiency.

This study aims to determine the circadian preference of medical residents, and correlations with specialty choice and job satisfaction.

Methods

The Horne-Ostberg Morningness-Eveningness questionnaire is a 19-item validated measure of morningness-eveningness, and is the gold standard measure of circadian preference (Figure 1). A modified version of this questionnaire was administered to 160 medical residents at a tertiary care institution. Residents represented several specialties within medicine and surgery. Results of the survey were analyzed with a student’s t-test to determine significant correlations between circadian preference and specialty choice, as well as job satisfaction.

13. For some reason you have gone to bed several hours later than usual, but there is no need to get up at any particular time the next morning. Which one of the following are you most likely to do?

Will wake up at usual time, but will not fall back asleep = 4
Will wake up at usual time and doze thereafter = 3
Will wake up at usual time, but will fall asleep again = 2
Will not wake up until later than usual = 1

Figure 1: Example questionnaire item

Results

160 residents representing ten specialties including Family Medicine, Internal Medicine, Radiology, Emergency Medicine, Neurology, Anesthesiology, General Surgery, Otolaryngology, Orthopedic Surgery, and Neurosurgery. The mean chronotype scores from all specialties fell within the category ‘neither morning nor evening’ type, and ranged from 46.18 to 54.76 (SD + 0.67). In order to aid in statistical analysis, some specialties were combined, to yield fewer groups:

Anesthesiology, Emergency Medicine, Radiology, Surgical Specialties, and Medicine Specialties. There was a significant difference in chronotype between emergency medicine residents and residents from anesthesiology (p=0.0007), surgery (p=0.0001), and medicine (p=0.0005). There were no other significant differences noted between groups. Residents in the surgical specialties trended towards morning chronotype. A Spearman’s correlation demonstrates a weak positive correlation between circadian preference and job satisfaction that was not significant(r = 0.1287, p = 0.1050).

Discussion

The number of significant correlations in this data set is low. It is possible that this is due to the relatively small size of the cohort. There are, however, several trends in the data that are worth mentioning.

Residents in Anesthesia and Surgery Specialties, which are quite similar in terms of daily start time, trend towards the morning chronotype. Residents in Emergency Medicine trend towards the evening chronotype. This finding is supported by the current literature which has found that the majority of EM residents are “night owls”.

These results may prove significant when considering the importance of “sleep debt”. “Sleep debt”, or “social jet-lag”, occurs when there is a discrepancy between sleep patterns when is working, and when one is free to determine their own schedule. In general, people are in debt of sleep on work days, and attempt to catch up on free days. In the general population, “night owls” often accumulate more sleep debt than most. In residency, however, both chronotypes accumulate sleep debt. Residents in the surgical specialties accumulate debt through long work days and inconsistent ‘on call’ schedules. Residents in EM may be more alert at work, as 2/3 of the 8 hour shifts begin at either 3pm or 11pm, however sleep debt is accumulated through the irregularity of the shifts. This is of concern given the literature that indicates a correlation between higher sleep debt and poorer cognitive function.

Conclusions

The results of this study could be used to help guide medical students in their choice of specialty, based on their chronotype. This data could also provide an impetus for re-evaluation of call schedules based on specialty and resident chronotype. The trends identified in this study may emerge as significant with more study subjects.