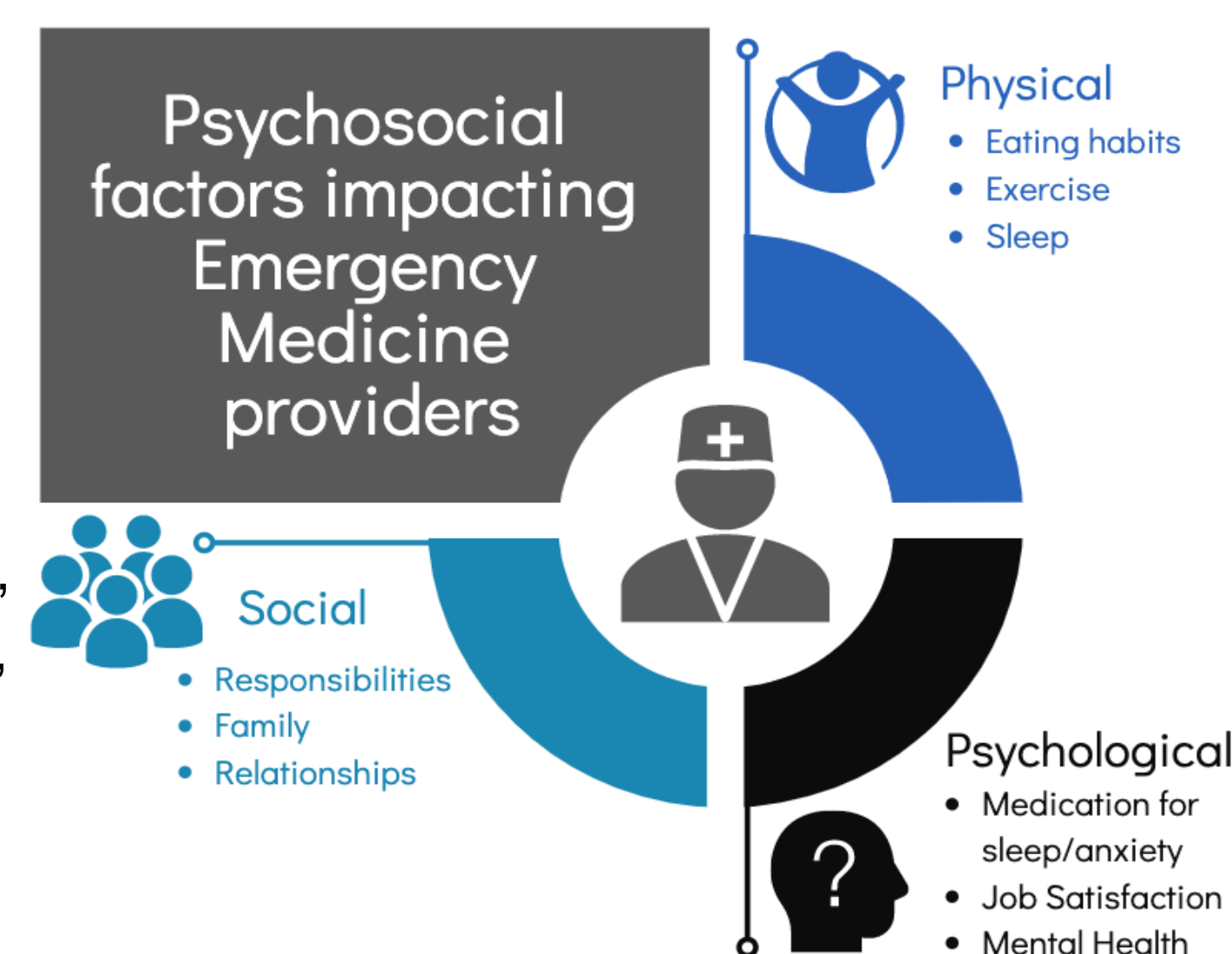


## INTRODUCTION

- Among the specialty of emergency medicine, providers, including physicians, physician assistants, advanced practice registered nurses, and residents of each, must be available at all hours to provide necessary medical attention during emergency situations. In order to fulfill this duty in the healthcare system, many emergency medicine providers are required to work varying shifts, including rotating between day and night shifts. Such shift work can disrupt the natural mammalian circadian rhythm potentially affecting processes such as body temperature and hormone production.<sup>1</sup> This circadian disruption has been correlated with chronic adverse health effects such as an increased risk of type 2 diabetes with rotating night shift work.<sup>2,3,4</sup>
- Furthering the understanding of biopsychosocial effects and employee perceptions of shift work may allow for prevention of adverse effects and management of employee perceptions to minimize possible adverse effects of shift work such as provider burn-out.

## PURPOSE OF STUDY

- This study aims to explore the perceptions of emergency medicine providers on how shift work influences their social, psychological, and physical quality of life measures including sleep, job satisfaction, diet, mental health, and work-family conflict. The study focuses on the demographic of emergency medicine physicians, physician assistants, and advanced practice registered nurses in Lexington, Kentucky.



## METHODS

- The study sample consisted of emergency medicine providers including physicians, physician assistants, advanced practice registered nurses, and residents of each employed at University of Kentucky Chandler Hospital and University of Kentucky Good Samaritan Hospital in Lexington, Kentucky. The University of Kentucky Institutional Review Board approved the conduction of this research.
- The survey was conducted using a Likert scale. **The survey had 14 questions that investigated the healthcare providers' perceptions of home life, sleep quality, diet, weekly exercise/activity, relations with significant others, relation with family and friends, relations with coworkers, and job satisfaction.** The questions were grouped together by the following subject areas: social, psychological, and physical. The questions were randomized in order to avoid any bias. Following the completion of data collection, survey responses were entered manually into an online database powered by Qualtrics. The data was then exported for analysis into the R software package.<sup>14</sup>
- A p-value of less than .05 was considered statistically significant.

## RESULTS

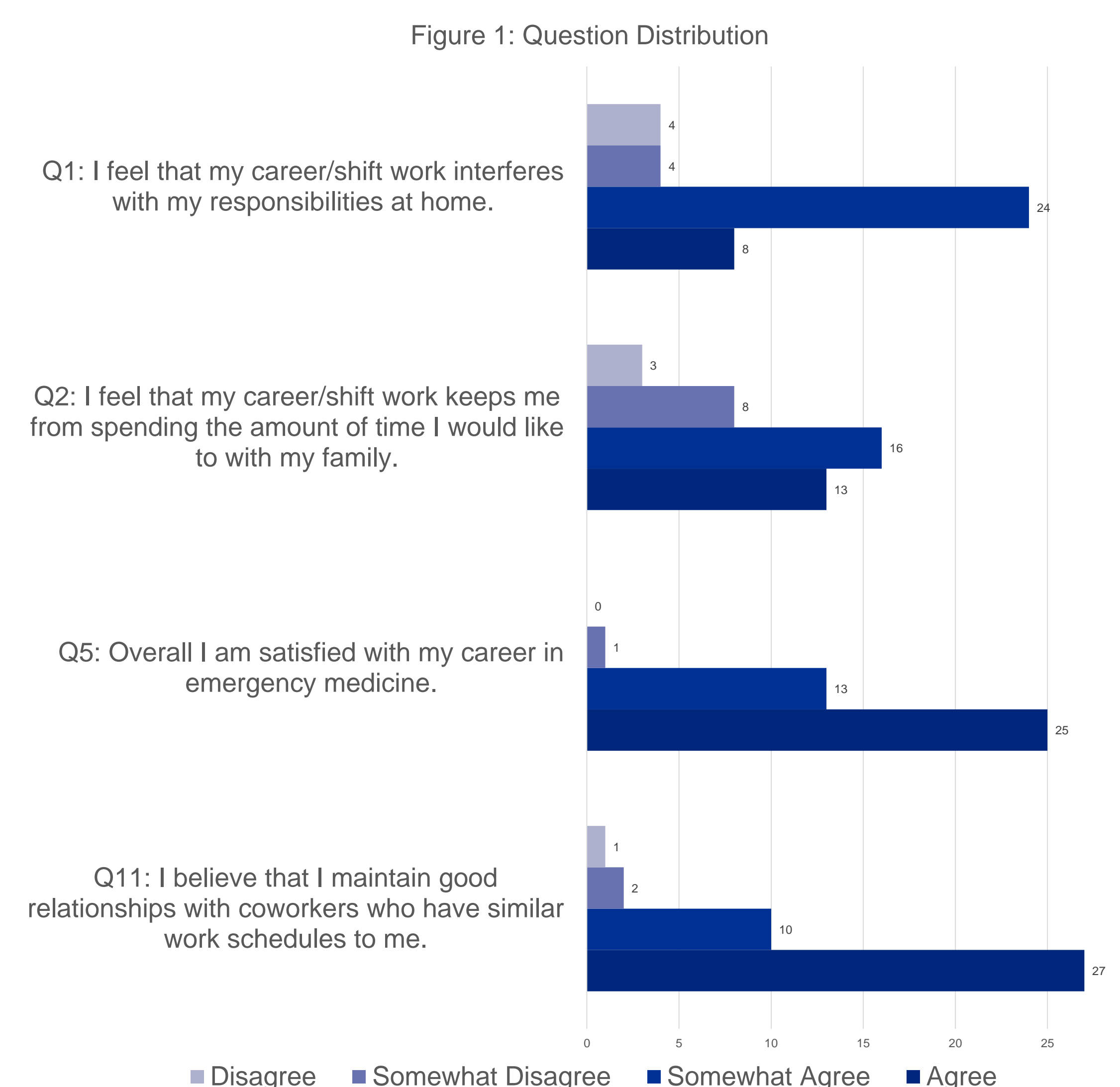
A total of 40 questionnaires were completed and entered on the electronic database. The following table shows the descriptive data (mean, standard deviation, and median) for each item on the questionnaire (Table 1).

Table 1: Descriptive Statistics for Complete Coded Dataset

Item	Median	Mean	Standard Deviation
Q1- I feel that my career/shift work interferes with my responsibilities at home	2.00	2.10	0.84
Q2- I feel that my career/shift work keeps me from spending the amount of time I would like to with my family	2.00	2.03	0.92
Q3- I believe that my career/shift work allows me to have an adequate amount of time with my significant other	2.00	2.41	1.07
Q4- I feel that shift work negatively influences my job satisfaction	3.50	3.10	1.08
Q5- Overall I am satisfied with my career in emergency medicine	1.00	1.38	0.54
Q6- I feel that shift work negatively influences my mental health. (i.e. stress, depression, problems with emotions)	2.50	2.60	1.13
Q7- I feel that I get an adequate amount of sleep because of my shift work	3.00	2.70	1.16
Q8- I have taken aids (antidepressants, sleep-aids, anxiety medication) for my sleep/stress due to shift work.	2.00	2.43	1.43
Q9- I believe that my career/shift work allows me to receive an adequate amount of weekly exercise	3.00	2.72	1.19
Q10- I believe that my career/shift work allows me to make healthy eating choices.	3.00	2.79	1.00
Q11- I believe that I maintain good relationships with coworkers who have similar work schedules to me.	1.00	1.43	0.71
Q12- I have trouble maintaining a normal sleep schedule when I am not working	2.00	2.13	1.24
Q13- I am satisfied with my current work schedule.	2.00	2.28	0.94
Q14- I am able to spend an appropriate amount of time with my children	2.00	2.43	1.23

- Our study revealed that, the emergency medicine providers on average were satisfied with their careers in emergency medicine and with their current shift work schedule, but were divided in opinion throughout various social, psychological and physical quality of life measures, as detailed in Table 1.
- Overall, providers did feel that shift work:**
  - interfered with responsibilities at home, kept them from spending adequate time with family,
  - did not allow them to get an adequate amount of sleep and required aids for sleep/stress
  - did not allow them to make healthy eating choices and did not have an adequate amount of weekly exercise
  - Caused them to experience trouble maintaining a normal sleep schedule when not working.
- Conversely, on average, providers did not feel that shift work negatively influenced**
  - their job satisfaction
  - felt that they maintained a good relationship with coworkers on similar work schedules
  - felt that they had adequate time to spend with their significant others and children.

When looking at the individual distributions of certain questions, 80% (32) of respondents answered positively to shift work affecting their responsibilities at home (Q1). 72.5% (29) of respondents reported positively (agree, somewhat agree) to their shift work negatively impacting their ability to spend time with family (Q2). 95% (38) of respondents reported positive overall job satisfaction (Q5), and 92.5% (37) reported they believe they can maintain good relationships with others with similar schedules (Q11). The distributions of these questions are reported below in Figure 1.



When looking specifically at the variables based on their category (social, psychological, and physical) additional analysis was performed to see the relationship these items had to each other. Using positive/negative coded data, Fisher's exact tests were used to determine the relationships between the items in each of the categories. The results of this analysis are reported in Table 2.

Table 2: Fischer's Exact Test with Dichotomous Variables

Social Items		Physical		Psychological	
Item	P-value	Item	P-value	Item	P-value
Q1:Q2	0.0245	Q7:Q9	0.0566	Q4:Q5	0.256
Q1:Q3	0.106	Q7:Q10	0.0586	Q4:Q6	0.000145
Q1:Q11	0.368	Q7:Q12	0.185	Q4:Q8	0.286
Q1:Q14	0.396	Q9:Q10	0.00376	Q5:Q6	0.487
Q2:Q3	0.000684	Q9:Q12	0.0866	Q5:Q8	0.348
Q2:Q11	0.548	Q10:Q12	0.0172	Q6:Q8	0.111
Q2:Q14	0.00603				
Q3:Q11	0.709				
Q3:Q14	0.00692				
Q11:Q14	0.206				

## DISCUSSION

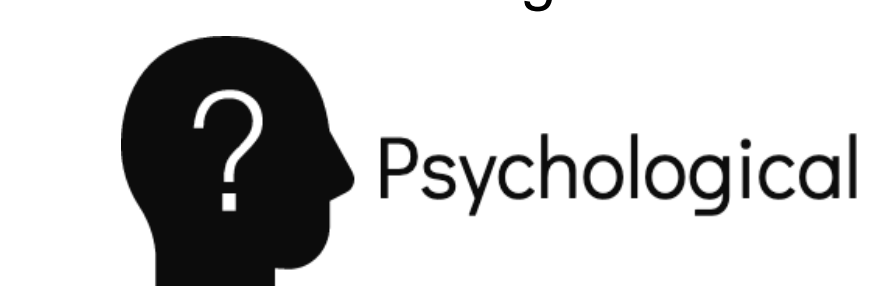
- A total of seven statistically significant relationships were found in the data that was organized by subject area, as displayed in table 2. The statistically significant relationships are listed below by category.



- Question 1 & 2**
  - Between career/shift work negatively affected the amount of time spent with family and interfering with responsibilities at home
- Questions 2 & 3**
  - Between shift work allowing adequate time with a significant other and family.
- Questions 2 & 14**
  - Between having adequate time with family and children.
- Question 3 & 14**
  - Between feeling that this career/shift work allowed adequate time spent with significant others and children.



- Questions 5 & 6**
  - Between belief that this career/shift work does not allow healthy eating choices and belief that this career/shift work does not allow providers to receive an adequate amount of weekly exercise.
- Questions 6 & 8**
  - Between this career/shift work not enabling healthy eating choices and providers having trouble maintaining a normal sleep schedule when not working.



- Questions 4 & 6**
  - Between feeling that shift work does not negatively influence job satisfaction and that shift work does not negatively influence mental health.

## CONCLUSION

The study had initially set out to examine the impact that rotating shift work had on the physical, social, and mental health of emergency department providers at UK Chandler Hospital and UK Good Samaritan Hospital located in Lexington, Kentucky. **The study found several statistical relationships, mainly those involving healthy eating choices, spending adequate time with significant others and children, mental health, and sleep as outlined above.** Gathering demographic data that could help to differentiate the population based on metrics like age, length of time on rotating shift work, and relationship/family status could provide additional relationships that were not discovered in this study.

## REFERENCES

- Harrington JM. Health effects of shift work and extended hours of work. *Occup Environ Med.* 2001;58:68-72. <http://dx.doi.org/10.1136/oem.58.1.68>.
- Pan A, Schernhammer E, Sun Q, Hu F. Rotating night shift work and risk of type 2 diabetes: Two prospective cohort studies in women. *PLoS Medicine.* 2011;8(12):e1001141.
- Shan Z, Li Y, Zong G, et al. Rotating night shift work and adherence to unhealthy lifestyle in predicting risk of type 2 diabetes: results from two large US cohorts of female nurses. *BMJ.* 2018. doi:10.1136/bmj.k4641.
- Hansen AB, Stayner L, Hansen J, Andersen ZJ. Night shift work and incidence of diabetes in the Danish Nurse Cohort. *Occupational and Environmental Medicine.* 2016;73(4):262-268.
- R Core Team (2013). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL <http://www.R-project.org/>.