

Effects of the 24-Hour Economy on Human Health and Performance: A practical Approach to the Issues of Night-Shift Work in Hospitals and possible Solutions

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Purpose

- The 24-Hour Economy: frequent night shift work leads to circadian misalignment
- Impacts on health of night shift workers and patients, efficiency at the workplace and on social life
- Investigates 3 questions
 1. What is the effect of correlation between decreased brain activity/sleep deprivation and higher error rates during nightshift
 2. Do employees suffer from health issues due to night-shift work? If yes, differences in gender?
 3. Behavioral differences in social life?

Methods

Survey design

- Online survey
 - Sent to hospitals in Netherlands & Germany
 - Addresses entire population of nurses and doctors, no distinction between departments
- Captures perception of employees regarding the 3 sub-research questions
 - 16 questions in total
 - 67 valid responses
 - 81% female
 - 70% below age of 25

Data analysis

- One sample t-test to investigate possible neutrality of night shift on performance at work
- Chi-square test to see if health issues and night-shift work are dependent
- One sample t-test to examine if night-shift work exerts influence on social behavior

Results

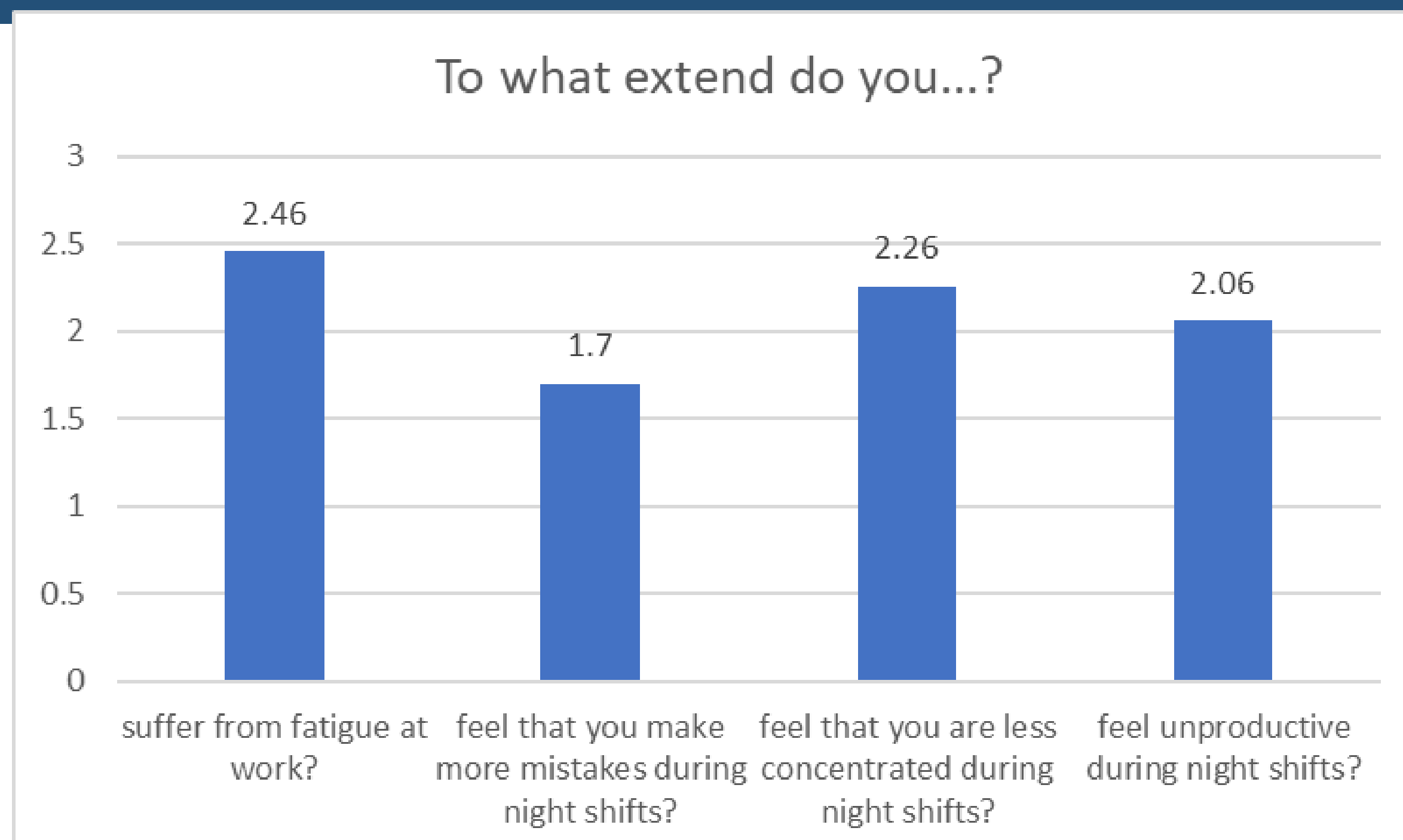


Fig. 1: Mean values of answer possibilities on the y-axis (in numerical values representing the degree of extend from 1 (0%) to 5 (100%). T-test was performed with test value 1. All corresponding p-values indicated a statistically significance difference to the test value.

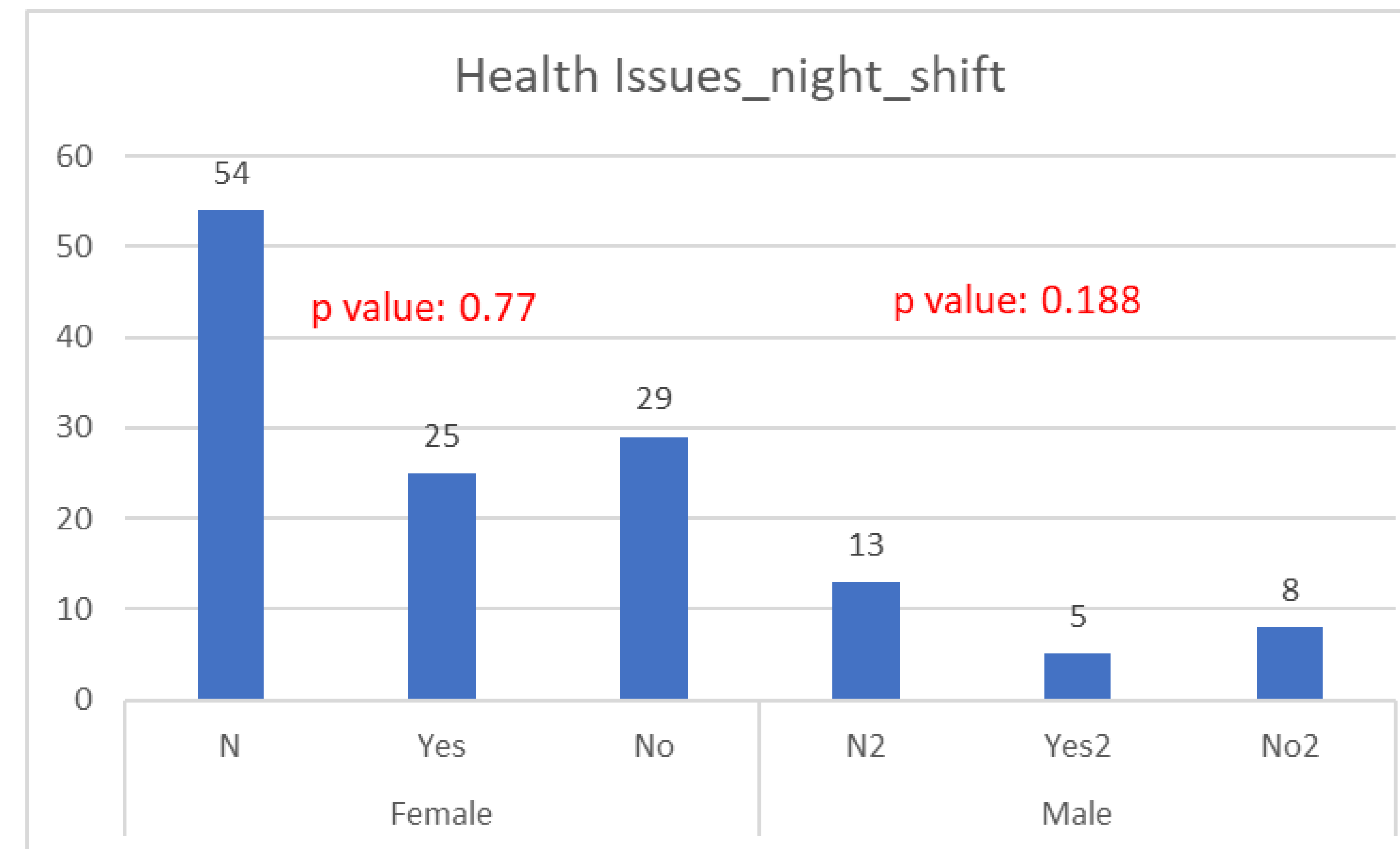


Fig. 2: Frequencies of answers adjusted to variable Health_Issues_night_shift with N=amount of respondents divided into genders. Yes means frequent night shift work and a worsening of health issues were crossed. P-values (in red) showed an independence of variables (observed frequencies occurred due to chance).

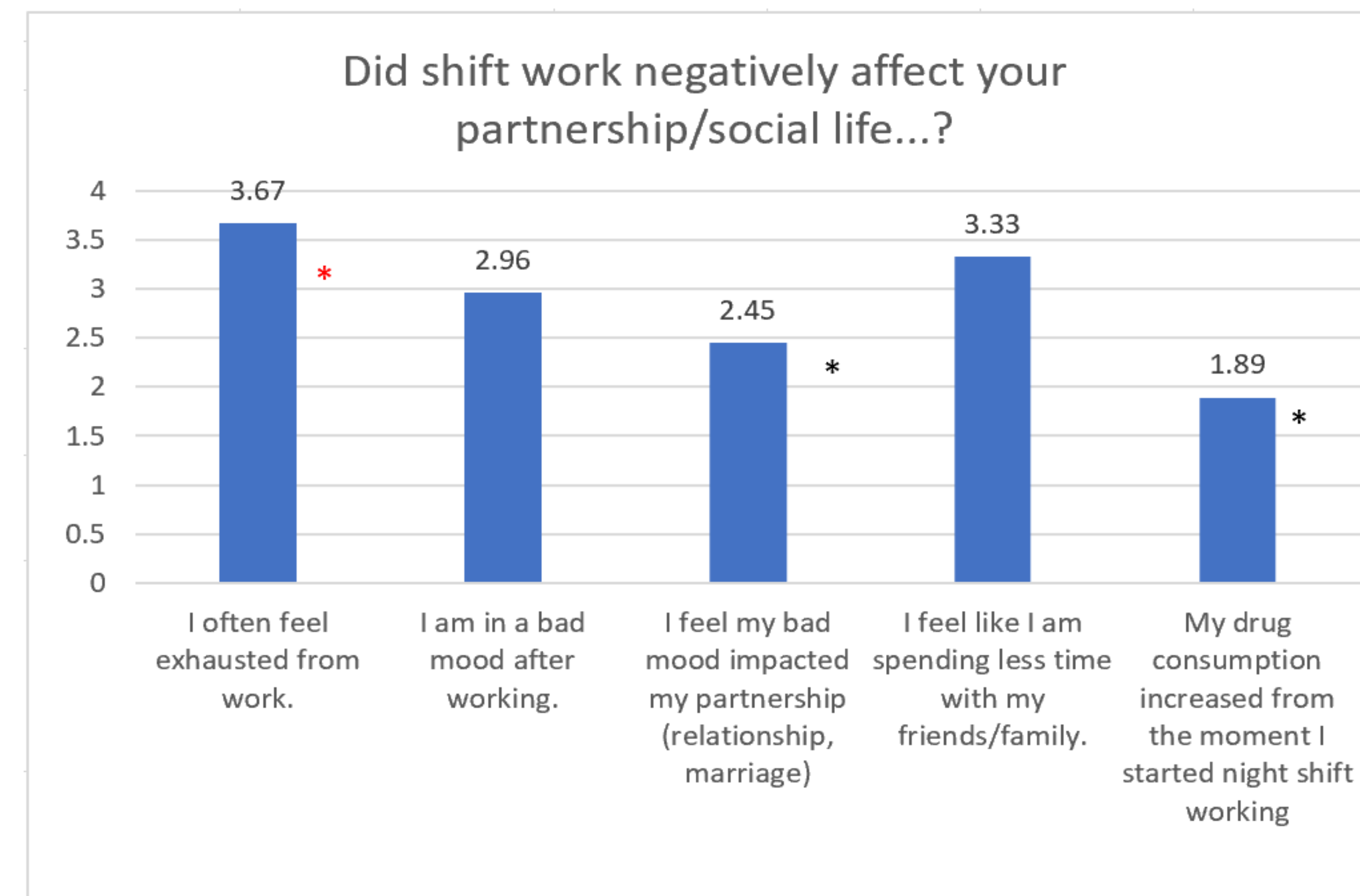


Fig. 3: Mean value of answer possibilities on the y-axis (in numerical values 1 (completely disagree to 5 (completely agree)). T-test was performed with test value 3 (neutral). Asterisks show mean values with statistically significant difference to test-value. Red asterisk shows a positive relationship.

Conclusion

Question 1

- There is a statistically significant relationship between increased fatigue and higher error rates
- increased error rate puts health of patients at risk and might lead to additional costs

Question 2

- No link between night shift work and physical/mental health issues
- Stands in contrast to recent findings by other researchers

Question 3

- Night shift work and feeling of exhaustion after work are connected
- Might increase the risk for burn-out and reduce capability of social interaction
- No effect on relationships or drug consumption

Solutions

- Reduction of high workload pressures by automation of work processes
- Digital monitoring of work environment to identify further issues
- Implementation of responsibility free breaks and a napping culture
- Active communication of health risks and countermeasures via workshops

Limitations

- Small sample size
- Very young sample population
- High fraction of female workers
- Respondents from different countries (health systems)

References

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