

# STRESS FROM ISOLATION

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## BACKGROUND

Social isolation may influence humans on the physiological and psychological level. Previous research showed that this may result in decrements in physical health and cognitive function, loneliness, anxiety, and depression. However, the effects on healthy adults are still relatively unexplored. Currently, I focus primarily on **sleep quality and physiological measures**.

The primary focus of my PhD research was on populations in isolated geographical locations and specific professions, such as astronauts on missions. After the outbreak of SARS-CoV-19, this topic became a global issue. Thus we included the populations undergoing anti epidemic lockdown measures. A deeper understanding may serve public health and medicine, government authorities, and space research.

## METHODS

### Psychological variables

- PSQI Sleep questionnaire
- UCLA loneliness scale

### Behavioral measures

- social interaction using sociometric monitors (only for isolated geo. loc.)
- sleep quality using actigraphs (only for isolated geo. loc.)

### Physiological measures

- HRV heart rate variability
- SEL stress measurements (only for isolated geo. loc. and space analogues)

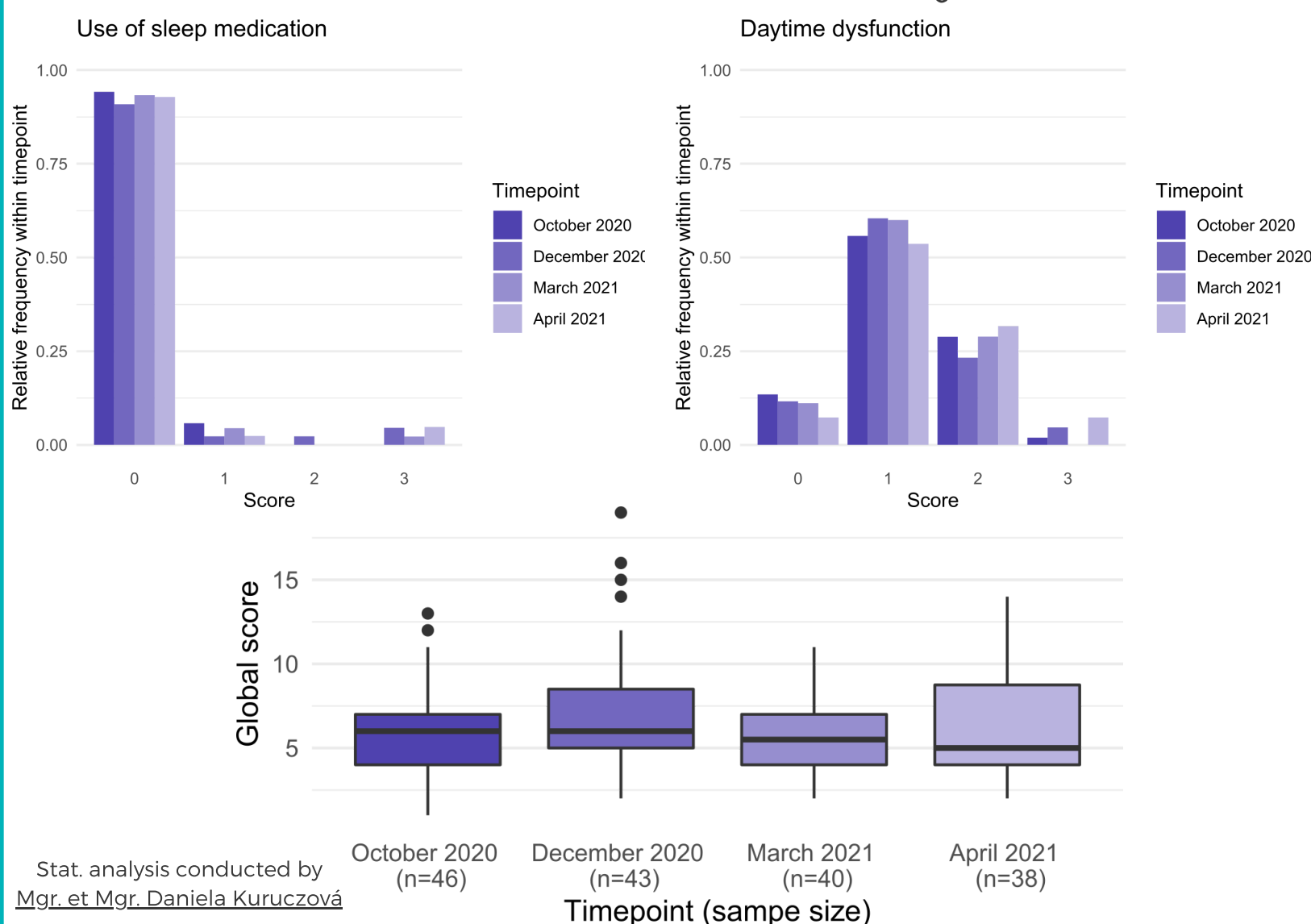


## LOCKDOWN

Quarantine, isolation, and social distancing were imposed as antiepidemic measures across the world after the outbreak of COVID-19. These may often result in unprecedentedly higher social isolation and related consequences across all age categories and social classes.

Our research group conducted **RESTRESS study** which started in October 2020 and consists of 57 individuals. The study aims to investigate the influence of lockdown measures on the volunteering employees of RECETOX. The influence of lockdown measures on sleep quality (PSQI) is in the scope of my PhD research.

Our preliminary results suggest that the sleep quality is influenced by the lockdown measures and season cumulatively. Overall **sleep quality was lowest in December**. The consumption of sleeping pills increased in some individuals. The Daytime dysfunction scores didn't change across measurements. These are some of the subscales of the PSQI.



Another insight into the influence of anti epidemic measures on the adolescents in Slovakia will be researched within the **Student's Professional Activity** (Stredoškolská odborná činnosť) by Lívia Pčolová. The aim of this work is to investigate loneliness (UCLA), sleep quality (PSQI, HRV) and cognitive functions (PVT) in 15-18 years old High school students. We want to include a mindfulness intervention experiment. I will supervise this work.

## SPACE ANALOGUES

Isolation is recognized as one of the main human hazards of space by NASA and ESA. Detailed research and countermeasures inventions are critical for the success of future space expeditions, which are becoming more commercially available to the wealthy and untrained population.

Our research group would like to perform research on social isolation using the abovementioned methods in space analogues, such as the **Astroland** in Spanish cave or the **Moon and Mars Base Analog** (MaMBA) in Germany.

## ISOLATED GEOGRAPHICAL LOCATIONS

Effects of social isolation on healthy adults are traditionally researched in isolated, confined, and extreme (ICE) environments. But many questions remain unexplored, such as how important is social interaction to sleep disruptions (Pattyn et al., 2017; Yoneyama et al., 1999) or how would mindfulness interventions affect the participants in polar setting (Pagnini et al., 2019).

Thus, we would like to conduct research at **Masaryk University's polar expedition** in the J.G. Mendel Czech Antarctic Station. The aims are

1. to investigate the sleep patterns of the crew using the subjective (PSQI) and objective (actigraphy) measurements
2. to investigate the frequency and duration of social interaction between the crew members (sociometric monitors)
3. to investigate mindfulness interventions on sleep quality and physiological variables
4. to investigate cognitive functions of the crew (PVT)
5. to investigate the physiological variables associated with sleep, such HRV
6. to investigate stress levels of the crew using the smart devices and novel prototype of technology Entrant.

## EXPECTED RESULTS

- **Higher social isolation would influence sleep quality and physiological variables** in all settings
- The **dynamics** of this influence **would differ between the settings**

## LITERATURE

- PAGNINI, Francesco, et al. Mindfulness and relaxation training for long duration spaceflight: Evidences from analog environments and military settings. *Acta Astronautica*, 2019, 165: 1-8.
- PATTYN, Nathalie, et al. Sleep during an Antarctic summer expedition: new light on "polar insomnia". *Journal of Applied Physiology*, 2017, 122.4: 788-794.
- YONEYAMA, S., Hashimoto, S., & Honma, K. (1999). Seasonal changes of human circadian rhythms in Antarctica. *American Journal of Physiology - Regulatory Integrative and Comparative Physiology*, 277(4 46-4), 1091-1097. <https://doi.org/10.1152/ajpregu.1999.277.4.r1091>