

### *Student's corner*

## **PhD Project: Digital Mindfulness Interventions in Oncology Work Environments**

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### **Background**

Medical technologists in radiology (MTR) are exposed to high work demands. In an international double-blind study (Beschner et al., 2022), 97% of German MTRs and employees in imaging technology reported experiencing moderate to severe stress. As a cause, 95% of respondents mentioned the level of workload. The shortage of specialists, as evidenced by the immediate need for 840 MTR positions nationwide, feeds into the stress factor workload. This shortage is unlikely to be alleviated in the near future since 25% of currently practicing MTRs will retire by 2030 for age reasons (Blum, 2019). Specifically, staff shortages, overtime, and direct contact with Covid-19 infected individuals/materials are considered as drivers of work stress for MTRs during the pandemic. Investigations and improvements of the stress experience are essential to conquer this potential health hazard (Koninklijke Philips, 2019).

MTRs in radiotherapy encounter numerous cancer patients every day to perform radiotherapy with them. This not only entails a high level of coordination and the resulting organizational stress. The emotional stress of the cancer patients also presents a challenge to the mental health of the MTRs. The skills of stress and emotion regulation as well as self-care are therefore important resources for MTRs to cope with everyday work and to stay healthy.

### **Research aim and method**

The study “Mindfulness Interventions in Oncology Work Environments” is designed, first, to determine whether digital health

promotion interventions are effective in reducing the experience of stress in MTRs. On the other hand, two apps – a digital, modern meditation intervention (7Mind app) and a digital, traditional breathing exercise intervention (Pranayama app) – will be used to explore effects on stress experience and health promotion, among other outcomes, in MTRs to draw conclusions on the feasibility and effectiveness of the components.

Prior to the intervention, all MTRs are made aware of the relevance of self-care in an approximately half-hour awareness-raising intervention during working hours, e.g. as part of an internal meeting. The intervention is offered twice per facility in order to ensure that work operations are maintained. Since no person-level randomization can take place due to structural conditions, the MTRs will be assigned to the intervention groups (7Mind app or Pranayama app) according to quasi-experimental designs by location.

Both groups are then given access to one of the two apps and are instructed to use it daily for 12 weeks. We recommended to use the app three times a day for 5-10 minutes, and allow practice at least once a day during working hours. Exclusion criteria include use of another meditation app, severe mental illness and sleep disorders requiring treatment. Included are MTRs who agree to app use (informed consent) and have access to their own smartphone.

The evaluation will be conducted through a mixed-methods design. Participating MTRs will be asked to answer standardized questionnaires about their stress experience, health behaviors, and other outcomes before

and after the intervention. Prior to the intervention, experience with breathing/meditation exercises and app use experience will be collected in addition to demographic variables (age, gender, work experience). Similarly, participants will have a hair sample taken before and after the intervention. Likewise, a 15-minute heart rate variability (HRV) measurement will be taken via chest strap before and after the intervention. After the intervention, a qualitative survey about the experience with the intervention and the evaluation of its (long-term) effectiveness is conducted in individual interviews.

### **Expected results**

Expected results are improvements in mindfulness, stress experience, resilience and work-related factors, job satisfaction and

emotion regulation, as well as in the physiological measures HRV and hair cortisol.

### **Planned research following this intervention**

a) Extension of the evaluation to patients - e.g.: Do patients perceive a change in the MTRs and how does it affect them (train-the-trainer approach)?

b) Expansion of the target group to include patients: Breast cancer patients (stress, high anxiety potential) receive daily radiation for 4 weeks and accompanying training (app).

c) Change of existing offers to focus on the more effective component (breathing/meditation), development of breathing and/or meditation measures for integration into health behavior change interventions.

### **References**

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