

## SULSA Postdoctoral and Early Career Research Exchange (PECRE) grant – Awardee report

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Title: The relationship between sleep, fatigue, cognitive dysfunction and chronic pain: Identifying temporal relationships and targets for treatment

Awardee: Daniel Whibley, PhD

Exchange period: 1 –31 August 2018

### *Scientific summary*

Within clinical populations with chronic pain, associations have been consistently demonstrated between poor sleep and higher levels of pain, fatigue and cognitive dysfunction. A better understanding of the direction and timing of these relationships is essential to inform optimal treatment. During the month-long period spent in the Kratz Lab, I was able to conduct analyses that identified a directional relationship between poor sleep and worse pain and fatigue on awakening in older, community dwelling adults living with osteoarthritis (OA). The observed effect of poor sleep on worse symptoms diminished throughout the day. This finding has a number of potential implications. Older adults with OA may be reassured that, while a poor night's sleep may lead to greater pain and fatigue on awakening, the effect is unlikely to be sustained. This information could be incorporated into Cognitive Behavioral Therapy for insomnia when delivered to patients with OA, and may inform optimal timing of pharmacological and non-pharmacological pain and fatigue interventions for this patient population.

### *New techniques learned*

Through mentorship provided by Dr Kratz and new collaborators (listed below), as well as access to the University of Michigan's Center for Statistical Consultation and Research, I had opportunities to expand my skillset to include:

- The use of multilevel models in the context of studies using ecological momentary assessment methodologies
- Simulation Modelling Analysis
- The use of actigraphy to objectively measure sleep variables in the context of naturalistic studies

### *New links made*

During the exchange I made links with new collaborators both within and outwith the University of Michigan. Specific contacts and the content of discussions/collaborative plans are outlined below:

- Jan Van den Bulck, Professor, Department of Communication Studies, University of Michigan: Developing a better understanding of how media use affects sleep, particularly in older adults.
- Galit Dunietz, Research Fellow, Sleep Disorders Center, University of Michigan: Investigating possible pathways through which impaired sleep might lead to the onset or persistence of musculoskeletal pain.

- Heidi Guyer, Senior Survey Director, Survey Research Center, University of Michigan. Dr Guyer facilitated access to the Health and Retirement Study (HRS) dataset: Future potential collaborative work includes investigating sociodemographic moderators of the sleep-pain relationship.
- Kevin N. Alschuler, Associate Professor, Department of Rehabilitation Medicine, University of Washington: An examination of relationships between perceived effort, sleep, pain and psychological variables in an ultra-endurance athlete.
- Martin Sliwinski, Director, Center for healthy Aging, Pennsylvania State University: Investigating daily variation in cognitive function in people living with fibromyalgia and the role of internal and external distractions.
- Nora Fritz, Assistant Professor, Neuroimaging and Neurorehabilitation Lab, Wayne State University: Investigating the feasibility and acceptability of telephone exercise therapy compared to in-person therapy.
- Susan Murphy, Associate Professor, Department of Physical Medicine and Rehabilitation, University of Michigan: Investigating the influence of sleep experiences on next-day pain and fatigue in the lives of older adults with osteoarthritis.

#### *Submissions*

During the exchange two abstracts were submitted to the American Pain Society (APS) 2019 Annual Scientific Meeting (outcomes pending):

- Characterizing fibrofog in daily life: ambulatory cognitive functioning in adults with fibromyalgia and matched controls
- The role of environmental distractions in the experience of fibrofog in real-world settings

#### *Planned submissions*

In addition to manuscripts pertaining to the abstracts listed above, a number of manuscripts are currently in preparation as a result of work or contacts made during the SULSA-funded period (working titles listed):

- Does a poor night's sleep lead to greater next-day pain and fatigue in older adults with symptomatic osteoarthritis? An actigraphy and ecological momentary assessment study
- Physical and psychological experiences of the fastest individual to row the North Atlantic
- Calling Out Multiple Sclerosis Fatigue: Validation of a Telephone-Delivered Exercise Intervention
- Daily fluctuations of pain acceptance, coping, and catastrophizing and their role in the daily lives of people with chronic pain and spinal cord injury
- Evidence of a curvilinear association between age and fatigability in a mixed sample

#### *Planned grants*

After completing the SULSA-funded placement, I returned to the University of Aberdeen where findings were disseminated. Now back in Michigan as part of my Versus Arthritis-funded fellowship, and building on work initiated during the SULSA-funded period, I am specifically targeting the University of Michigan's Geriatric Center Pilot Grant (\$40,000, deadline January 2019), with support from Dr Kratz.

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