

# Protocol: Return to work after concussion - A survey of employees with persistent post-concussion symptoms and their employers regarding the initiatives to support reintegration in the work environment

## Background and study aims

Concussion is one of the most frequently used neurological diagnoses in the Danish healthcare system and constitute more than 90 % of all head traumas<sup>1</sup>. It is estimated that approximately 25,000 patients yearly become diagnosed with concussion in Denmark, but this may be underestimated since some patients do not seek medical assistance after concussion<sup>2</sup>.

Most patients experience spontaneous recovery within the first 2-3 weeks<sup>3</sup>, but up to 40 % develop persistent post-concussion symptoms (PPCS) such as headache, dizziness, vision problems, sleep problems, fatigue, concentration and memory difficulties, emotional problems etc.<sup>4</sup>, which last beyond the natural recovery period. While some recover during the first months, approximately 35 % will continue to have symptoms 3 to 6 months or more after the trauma, including posttraumatic psychological reactions such as anxiety, stress and depression<sup>5-8</sup>. The PPCS have a long lasting effect on labor market attachment and employees with PPCS may therefore need support to stay employed. A Danish study shows that 43 % of employees with PPCS lose their connection to the labor market 5 years after the trauma and that 19 % receive welfare payments indicating reduced working capability<sup>9</sup>. Furthermore, 5 % end up leaving labor market altogether by receiving health-related early retirement pension<sup>9</sup>.

The aim of this study is therefore to gather knowledge on which work-associated initiatives are presently used by Danish employers in order to support return to work of employees with PPCS. Secondly, we aim to map the needs of the employees and employers regarding their knowledge about PPCS in order to provide support for successful return to work and work stability in employees with PPCS.

The results from the survey will inform the content of an information material aimed at employers regarding how to create the best circumstances for employees with PPCS during the return-to-work process.

## Material and Methods

**Study design:** Cross-sectional multicenter observational survey study. The study is a national survey design where the employees with PPCS and their employer complete the survey. The employees complete one survey (at the start of the study), and the employer completes two surveys: one about the return of the employee to the workplace some months after the employee has been enrolled in the study (1st follow-up) and one about maintaining the affiliation with the workplace 4 to 5 months after first follow-up (2nd follow-up).

**Inclusion criteria:** Danish employees aged 18 - 65 years diagnosed with concussion according to the International Classification of Diseases (ICD-10) with PPCS lasting more than 4 weeks<sup>10</sup>, who have experienced return to work within the last 12 months. It is furthermore required that the employees have been gainfully employed under regular conditions or have been available for employment under regular conditions at the moment of head trauma. Must be able to communicate in Danish. The relevant employers are recruited through the employees, by the employee providing contact to their employer. The employers must be able to communicate in Danish.

**Setting:** The study is run by University of Copenhagen (Denmark) and the Danish Concussion Centre. The participants will be recruited from multiple sites around Denmark that offer treatment and rehabilitation to persons with PPCS.

**Data collection:** The employee survey at baseline will collect information about symptom severity via The Rivermead Post-Concussion Symptom Questionnaire (RPQ); data on work-related activities via the Work Productivity and Activity Impairment Questionnaire (WPAIQ)); and The Work Role Functioning Questionnaire v2.0 (WRFQ). The first survey of the employer will be about the return of the employee to the workplace 5 months after the employee has been enrolled in the study (1st follow-up) and the second about maintaining the affiliation with the workplace 4 to 5 months after first follow-up (2nd follow-up). These surveys consist of several validated questionnaires (RPQ, WPAIQ, and WRFQ) and specific survey questions developed by the scientists and clinicians participating in the study.

## **Outcomes**

**Primary outcome measure:** Work-related initiatives (i.e. amount and type) that are applied across a variety of work places in Denmark measured using employee survey at baseline and employer surveys at 5 and 10 months.

**Secondary outcome measures:** Information regarding the needs for knowledge of the employers in order to support successful reintegration in the work place for employees with persistent post-concussion symptoms with the aim of ensuring stable long-term return to work measured by employer surveys at 5 and 10 months

## **Data analysis**

**Sample size:** Aiming at inclusion of 100 persons with PPCS.

Descriptive data will be summarized using frequency distribution, percentage or standard deviation according to the data. Groups will be compared by  $\chi^2$ -test or t-test. Non-parametric data will be analyzed with non-parametric test as Kruskal-Wallis H test and Mann–Whitney U test. Association between e.g. work related adaptations and the size of the company will be analyzed with logistic regression. Statistics will be conducted in SPSS.

## **Trial duration**

Recruitment start date: 01/10/2021

Recruitment end date: 31/08/2022

Follow-up end date: 30/11/2022

## **Funding**

The study is funded by Velliv Foreningen.

## Ethical approval

Approved by The Institutional Ethical Review Board, University of Copenhagen, Department of Psychology  
ref: IP-IRB/17082021.

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