

Biopsychological Prediction Models of Pain Management Programme (PMP) Outcomes for Chronic Pain

PhD studentship award report

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Overall project summary

This PhD project aims to identify the factors that enable some chronic pain patients in the UK to benefit from pain management programmes (PMPs), which are the preferred intervention for patients suffering from moderate to severely disabling chronic pain. Despite their effectiveness, PMPs are expensive and resource-intensive, and show variable outcomes across patients, with some showing improvement, no change, or even deterioration. This project will focus on identifying "enabling factors" associated with positive PMP outcomes, and will conduct three studies: a systematic review and meta-analysis to assess predictors of PMP outcomes, the development of a clinical prediction model of PMP outcomes using patient data from a local NHS pain management centre, and the use of Q-methodology to identify new "enabling factors" associated with positive PMP outcomes. The project will focus on emotional functioning outcomes for the systematic review and meta-analysis, while study 2 will use existing patient-reported and physician-reported data as predictors to develop the clinical prediction model. Study 3 will use Q-methodology to identify predictors of positive PMP outcomes that may be missed in the quantitative literature, allowing for nuanced, subjective perspectives from those involved in PMPs (including patients and practitioners). Ultimately, the project aims to identify which patients are most likely to benefit from PMPs and to focus interventions on those patients or better tailor PMPs to patient needs.

Study 1: Systematic review and meta-analysis of pain management programme (PMP) outcomes for chronic pain

Summary: This is a study on identifying biological, psychological, and social factors that can predict pain management program (PMP) outcomes for emotional functioning in chronic pain patients from existing literature. The study involves a systematic review and possibly a meta-analysis of individual studies that have identified prognostic factors for PMP outcomes. The research focuses on emotional functioning, which has not been adequately reviewed despite its importance as an outcome domain for chronic pain clinical trials.

Progress: The systematic review has been completed. The manuscript is in its 3rd full draft, under review by the supervisors, and is expected to be submitted for publishing after one or two more rounds of feedback.

Study 2: Predicting pain management programme (PMP) outcomes for chronic pain: development and validation of multivariable prediction models

Summary: This study focuses on developing statistical models to understand how patient-reported outcomes can be predicted after participation in a Pain Management Programme (PMP). The study aims to use an existing clinical database, the Walton Centre NHS Foundation Trust's 'Pain Management Registry', to develop the model, assess its overall accuracy and assess the relative contribution of specific prognostic factors. The developed prediction model could potentially help to prospectively identify patients who would benefit from PMPs or to identify where PMPs might not be meeting the needs of certain patients. The study will use regression-based analyses to model associations between pre-programme patient characteristics and patient-reported effects of the PMP as measured at post-programme follow-up. The planned statistical analysis involves mixed effects logistic regression and linear mixed effects models.

Progress: A university ethics application was approved and data obtained from the Walton Centre. The data cleaning stage is nearly complete. Data analysis will commence in May 2024, while interpretation of the data is planned to start in September 2024, with a full draft of the study expected to be completed early next year.

Study 3: Identify new 'enabling factors' that promote PMP engagement and long-term benefits: A Q-method investigation

Summary: Study 3 will use Q-methodology to better understand why some people benefit from pain management programmes. The goal of this study is to find out what factors contribute to successful outcomes in pain management programmes, beyond what previous research has shown. These new factors would be called "enabling factors". The study will involve talking to patients, caregivers, GPs, and other staff to get their personal experiences and opinions. By doing this, we hope to capture all the important information about pain management programmes. After the interviews are finished, the researchers will use the information they gathered to create a set of statements called a "Q-set". These statements will be grouped by theme and will come from the interviews and previous research on the topic. Each statement will describe a patient characteristic that could be considered an "enabling factor". Then, another group of patients and staff will be asked to rank the statements within each Q-set according to how much they agree with them. This process is called a "Q-sort". The researchers will analyse the results of the Q-sort to find any similarities between the participants' rankings and to identify any possible consensus on the topic.

Progress: NHS REC approval has been received, and recruitment for the qualitative interviews is planned to begin around June 2024. The development of the Q-set and the Q-sort stage of the study will follow in the autumn. We plan to finish the study by the summer of 2025.

Gantt chart indicating study plans and progress

