



## Rumination and behavioural factors in Parkinson's disease depression



Camille L. Julien<sup>a,b</sup>, Katharine A. Rimes<sup>a</sup>, Richard G. Brown<sup>a,\*</sup>

<sup>a</sup> King's College London, Institute of Psychiatry Psychology and Neuroscience, Department of Psychology, London, UK

<sup>b</sup> Department of Health and Rehabilitation Psychology, Barts Health NHS Trust, London, UK

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### ABSTRACT

**Objective:** Parkinson's disease is associated with high rates of depression. There is growing interest in non-pharmacological management including psychological approaches such as Cognitive Behaviour Therapy. To date, little research has investigated whether processes that underpin cognitive models of depression, on which such treatment is based, apply in patients with Parkinson's disease. The study aimed to investigate the contribution of core psychological factors to the presence and degree of depressive symptoms.

**Methods:** 104 participants completed questionnaires measuring mood, motor disability and core psychological variables, including maladaptive assumptions, rumination, cognitive-behavioural avoidance, illness representations and cognitive-behavioural responses to symptoms.

**Results:** Regression analyses revealed that a small number of psychological factors accounted for the majority of depression variance, over and above that explained by overall disability. Participants reporting high levels of rumination, avoidance and symptom focusing experienced more severe depressive symptoms. In contrast, pervasive negative dysfunctional beliefs did not independently contribute to depression variance.

**Conclusion:** Specific cognitive (rumination and symptom focusing) and behavioural (avoidance) processes may be key psychological markers of depression in Parkinson's disease and therefore offer important targets for tailored psychological interventions.

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### Introduction

Depression is common in Parkinson's disease, with over one third having a depressive disorder, subsyndromal depressive symptomatology or significant psychological distress [1]. There has been a welcome advance in the number and quality of randomised controlled trials (RCTs) of antidepressants, although a recent meta-analysis identified only small to moderate effect sizes [2], and the non- and partial-response rates to antidepressant medication are typically high in older adults and those with chronic physical health problems [3]. Management is further constrained by the potential for adverse drug interactions [4], evidence for suboptimal treatment by clinicians [5] and the facts that patients themselves express concerns about antidepressant medication [6,7] with poor treatment adherence [8].

Explanations for depression in Parkinson's disease have typically focussed on potential biological based mechanisms with disturbances of brain monoamine systems [9]. However, the response to pharmacological treatments, and other evidence suggests a broader bio-psychosocial formulation is needed, both to define factors that may cause and maintain depression in the context of a progressive

and disabling condition, and to guide the development of effective management [10]. Evidence supports an association between psychological and social factors and the presence and severity of depression in Parkinson's disease. For example, cognitive and behavioural avoidance as a coping response to illness related stressors, and negative illness representations are associated with depression, while active task-oriented coping tends to be associated with greater psychological well-being [11–14]. While not necessarily causal, such factors may alter the risk of depression onset and relapse or serve to maintain symptoms. Such evidence has stimulated exploration of psychological approaches, particularly Cognitive Behaviour Therapy (CBT), as a potential alternative or adjunct to pharmacotherapy. Trial evidence [15,16] suggests that significant treatment effects can be obtained [17], while the flexibility for delivering treatment in groups, by telephone [18] or via the internet, offers opportunity to reach a large number of patients, economically and in a way that some may prefer [6].

While evidence suggests that CBT can be effective, there are challenges where mood problems exist in the context of an objectively progressive and disabling condition with complex morbidity. Negative and unhelpful beliefs and assumptions, are central to the Cognitive Model of depression and a key treatment target [19]. However, the nature and content of such thoughts may be realistic in a chronic disease, and it is unknown whether they form a logical or useful therapeutic target in Parkinson's disease. Other potential targets may include

\* Corresponding author at: Institute of Psychiatry Psychology and Neuroscience, PO77, De Crespigny Park, London SE5 8AF, UK.

E-mail address: [richard.g.brown@kcl.ac.uk](mailto:richard.g.brown@kcl.ac.uk) (R.G. Brown).

maladaptive behavioural coping, unhelpful illness representations and repetitive thought processes such as worry and rumination [20–23]. All of these may serve as vulnerability factors, and/or become activated in the context low mood to help maintain a depressive episode. There is the potential to modify CBT so that it targets those processes that contribute most to depression onset, maintenance and/or relapse, while reducing emphasis and time spent on less relevant elements of therapy.

The present study aimed to assess the relative contribution of a range of psychological factors either known to be associated with depression in Parkinson's disease, or predicted by the Cognitive Model that underpins conventional CBT. The results may support the value of current CBT approaches or suggest alternatives or adaptations with the potential to improve outcome.

## Methods

### Participants

Participants with a clinical diagnosis of Parkinson's disease [24] were recruited via an existing research cohort ('Prospective Study of Mood States in Parkinson's Disease' (PROMS-PD), Ethics Ref: 07/MRE01/9, UKCRN ID: 2519) [25]. The full cohort of 513 represented a consecutive series of consenting participants recruited over a 12 month period from specialist Parkinson's disease or Movement Disorder clinics in a number of centres in England and Wales. They had a mean age of 67.9 years (SD = 10.3, Range = 32–94 years) and 65% were male. Mean duration of PD was 6.9 years (SD = 6.0, Range = 0–39 years). Significant cognitive impairment (MMSE  $\leq$  24) [26] was present in 10.2%. Almost all participants in the cohort (94.9%) were taking antiparkinsonian medication at the time of recruitment.

From this cohort, participants for the present study were excluded if they had no given consent to be re-contacted about other studies; if they had a history of psychiatric disorder other than mood or anxiety disorder; a history of major neurological disorder other than Parkinson's disease (e.g. stroke), or a score of 24 or less on the MMSE [26]. Additionally, cohort participants who had been assessed as part of the main PROMS-PD study or other supplementary study within the previous 3 months were not approached to avoid over-testing. Written informed consent was obtained from all participants. Ethical approval for the study was granted by the South London Research Ethics Committee 4 (Reference 10/H0807/60).

### Assessment

Consenting participants completed a set of postal questionnaires assessing demographic and disease-related information, mood and psychological factors.

General physical health was measured using the physical health subscale from the Duke Older Americans Resources and Services (OARS) Multidimensional Functional Assessment Questionnaire (OMFAQ) [27]. Parkinson's disease related disability was assessed as a proxy for total motor and non-motor symptom burden using the Parkinson's Activities of Daily Living Scale (PADLS). The scale has been shown to correlate with clinical ratings of disease severity ( $r = 0.68$ ) and duration ( $r = 0.39$ ) [28].

Self-reported depressive symptoms were assessed using the Beck Depression Inventory Second Edition (BDI-II) [29], with a score of  $\geq 14$  indicating significant symptoms [30,31]. A set of psychological factors were assessed. These were selected to cover a range of psychological constructs relevant to models of depression in general and in the context of a physical health condition. Where appropriate, for some measures, minor changes were made to the wording of the instructions and scale items to make them appropriate to older adults with PD.

1. The 24-item Dysfunctional Attitude Scale (DAS-24) [32] a self-report measure of general (rather than situation specific) unhelpful beliefs that an individual may hold about themselves, the outside world or their future, relating to aspects of personal achievement, dependency on others and self-control (e.g. 'My happiness depends more on other people than it does on me', 'If I do not do as well as other people, it means I am an inferior human being').
2. The Ruminative Responses Scale (RRS) from the Response Styles Questionnaire [33] is a 22-item scale, which assesses the general tendency to respond to negative emotions with ruminative thoughts, e.g. going somewhere to be alone and think about your feelings, dwelling or how sad you feel, or pondering vague questions such as 'what am I doing to deserve this?'. Rumination is considered a metacognitive process (thinking about thinking and feelings) where the focus is the thinking style rather than the thought content.
3. The Cognitive and Behavioral Avoidance Scale (CBAS) [34] is a 31-item multi-dimensional measure of cognitive and behavioural avoidance, i.e. not thinking about or engaging in certain actions, or efforts to escape from situations, as a means of minimizing threat and distress. It has four reliable factors, Behavioral Social Avoidance (e.g. 'I do not go out to events when I know there be a lot of people I do not know'), Behavioral Non-social Avoidance (e.g. 'I quit activities that challenge me too much'), Cognitive Social Avoidance (e.g. 'I just wait out tension in my relationships hoping that it will go away') and Cognitive Non-social Avoidance (e.g. 'I avoid making decisions about my future').
4. The Revised Illness Perceptions Questionnaire (IPQ-R) [35] assesses dimensions of illness perceptions across a range of health conditions, focussed here on the participant's Parkinson's disease. The IPQ-R assesses aspects of the individual's personal beliefs and understanding through which they seek to make sense of their health condition: its nature and defining symptoms (identity), beliefs about cause(s), its timeline (acute or chronic), its consequences and long-term impact, and beliefs about control. These are assessed through a series of subscales. Following previous research on the instrument's properties in Parkinson's disease [36], four disease related symptoms were added to the existing checklist on the Identity subscale. An Emotional Representations subscale in the original was not used as it was judged to be very close conceptually to depression and might therefore bias data interpretation.
5. The Cognitive and Behavioural Responses to Symptoms Questionnaire (CBSQ) [37] is a measure of beliefs and behavioural responses to symptoms of their health condition. The form used measured five cognitive (belief) subscales: Fear Avoidance Beliefs ('I am afraid that I will make my symptoms worse if I exercise'), Catastrophizing Beliefs ('I worry that I may become permanently bedridden because of my symptoms'; Damage Beliefs (e.g. 'symptoms are a signal that I am damaging myself'), Embarrassment Avoidance Beliefs (e.g. 'the embarrassing nature of my symptoms prevents me from doing things'), and Symptom Focusing, (e.g. 'I think a great deal about my symptoms'). Two behavioural subscales assessed 'All or Nothing' Behaviour (e.g. 'I tend to overdo things and then rest up for awhile') and Avoidance/Resting (e.g. 'when I experience symptoms, I rest').

### Statistical analyses

All analyses were performed using SPSS version 17.0 for Windows (SPSS Inc.). Data were screened for outliers and missing values. No transformations were judged necessary and all variables met criteria for the assumptions of multivariate analysis [38].

Hierarchical multiple regression analyses were planned to determine the proportion of variance in the current depression (BDI-II) accounted for by psychological variables, in addition to that explained by the planned covariate of motor disability (PADLS). In order to reduce the number of independent variables entered into the main regression model, subscales of the IPQ-R and CBSQ were entered into separate

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