

The Oxford Institute of Clinical Psychology Research & Training

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Abstracts

Systematic Review of the Literature

Background: The Rivermead Post-Concussion Symptoms Questionnaire (RPQ) is widely used to assess post-concussion symptoms after Traumatic Brain Injury (TBI), particularly mild TBI (mTBI), yet uncertainty remains regarding its psychometric properties and score interpretation.

Objective: To systematically evaluate and synthesise evidence on the psychometric properties of the RPQ using the COSMIN framework.

Methods: Five electronic databases were searched. Studies reporting quantitative evaluation of COSMIN-defined measurement properties of the RPQ in adult samples were included. Methodological quality was assessed using the COSMIN Risk of Bias checklist and findings were narratively synthesised.

Results: Fifteen studies were included. Evidence was strongest for structural validity, with higher-quality studies supporting a multidimensional structure characterised by conditional unidimensionality. Internal consistency was generally adequate for total scores when aligned with established structure. Evidence for reliability, measurement invariance, measurement error and responsiveness was limited or absent.

Conclusions: The RPQ is best supported as a measure of overall subjective symptom burden, with important evidence gaps limiting interpretation of domain scores and sensitivity to change.

Keywords: Rivermead Post-Concussion Symptoms Questionnaire, Measurement Properties, COSMIN

Service Improvement Project

Background: Anti-racism training is increasingly implemented within clinical psychology training programmes; however, there is limited evidence regarding how such training influences practice.

Aims: This service improvement project explored course tutors' perceptions of an anti-racism training programme delivered within the Oxford Institute for Clinical Psychology Training and Research (OxICPT-R), with the aim of identifying barriers and facilitators influencing whether learning from the training is translated into practice. Importantly, the study focused on perceived impact rather than directly measuring behavioural change.

Method: Eight course tutors who had completed the training participated in semi-structured interviews. Data were analysed using inductive reflexive thematic analysis (Braun et al., 2019; Braun & Clarke, 2019). Following thematic analysis, findings were mapped onto the Capability, Opportunity, Motivation Behaviour (COM-B) model to support interpretation of factors influencing perceived behaviour change.

Results: Five themes were generated: emotional discomfort as a catalyst for anti-racist learning; developing motivation for anti-racist practice; barriers to translating awareness into action; negotiating power and privilege in clinical psychology training; and training structures as enablers or constraints on anti-racist practice. A number of sub-themes were also generated. Participants described increased reflective awareness and ethical motivation following training, but also identified personal and structural barriers that limited the translation of insight into perceived sustained behavioural change.

Conclusions: The findings suggest that while anti-racism training may promote reflection and motivation among course tutors, perceived meaningful behavioural change is influenced by broader structural and relational factors within training environments. Applying the COM-B framework highlighted the importance of enhancing practical capability, creating

opportunities for ongoing reflection, and embedding anti-racism within institutional structures to support sustained change.

Keywords: Anti-racism, Clinical Psychology training, Behaviour Change, COM-B model

Theoretically Driven Research Project

Background: Carers are central to community stroke rehabilitation yet frequently experience high burden and reduced wellbeing. Social Identity Theory (SIT) proposes that pre-incident group membership and continuity of these identities, may protect psychological adjustment during major life transitions.

Aims: To examine whether pre-stroke multiple group membership predicts carers' wellbeing beyond burden and six-month post-stroke cognitive impairment (PSCI), and whether social identity continuity predicts lower burden beyond PSCI.

Methods: In a cross-sectional dyadic study, 55 stroke survivor–carer dyads were recruited from the Oxford Cognitive Screen-Recovery (OCS-Recovery) database. Carers completed measures of wellbeing, burden, multiple group membership, and identity continuity; survivors' six-month cognition was indexed using OCS performance.

Results: Multiple group membership did not predict wellbeing beyond burden and PSCI. Social identity continuity significantly predicted lower burden independent of PSCI.

Conclusions: Maintaining valued group memberships is associated with reduced perceived burden in chronic stroke caregiving. Identity continuity may offer a clinically meaningful pathway for carer interventions.

Keywords: Informal Carers, Stroke, Social Identity, Identity Continuity, Carer Burden, Carer Wellbeing

Systematic Review of the Literature: Psychometric Properties of the Rivermead Post-Concussion Symptoms Questionnaire: A COSMIN-Informed Systematic Review

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Proposed Journal: Neuropsychological Rehabilitation: This journal publishes research relevant to rehabilitation, recovery of function and brain plasticity. This includes research pertaining assessment including recent publications regarding psychometric validation of screening tools.

Abstract

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Keywords: Rivermead Post-Concussion Symptoms Questionnaire, Measurement Properties, COSMIN

Introduction

Mild Traumatic Brain Injury (mTBI) is amongst the most common neurological conditions worldwide (Lefevre-Dognin et al., 2021). Despite injuries typically resolving within weeks, a proportion of people report ongoing post-concussion symptoms (PCS) for months, and for a subset, up to 10 years post-injury (Balalla et al., 2020; Hiploylee et al., 2017). Symptoms encompass somatic, cognitive and emotional domains, for example, fatigue, sleep disturbance, memory difficulties and anxiety (Broshek et al., 2015) and are associated with reduced quality of life and return to work (Polinder et al., 2018). Given their wide-reaching impact, accurate assessment of PCS is important to clinical decision-making, research outcomes and service planning.

Both clinically and in research contexts, PCS are assessed via patient-rated outcome measures (PROMs). However, given the non-specific nature of PCS, the overlap with symptoms commonly reported by other clinical groups, for example, chronic pain, depression, anxiety and stress-related conditions (Clark et al., 2022; Ettenhofer & Barry, 2012) raises concerns regarding the validity and reliability of PCS measures. To understand how PCS are measured, it is important to outline the theoretical underpinnings of post-concussion symptomatology and their implications for assessment.

PCS are often conceptualised as a multi-dimensional, subjectively experienced construct comprising partially overlapping but theoretically distinct symptom domains (Eyres et al., 2005; Franke et al., 2015; King et al., 1995). Symptoms are suggested to reflect interacting neurological, psychological and physical processes rather than a single underlying mechanism (Iverson, 2005; Polinder et al., 2018). The manifestation of such symptoms is influenced by individual and contextual factors, contributing to heterogeneity in recovery trajectories (Hou et al., 2012; Polinder et al., 2018; Theadom et al., 2023).

A key feature of these models is the distinction between objective impairment and subjective symptom experience, highlighting that psychological factors may complicate recovery. The neuropsychological model of functional outcomes after mTBI (Kay et al., 1992) suggests that neurological disruption indirectly influences functioning via the individual's ability to appraise cognitive, emotional and physical changes. Psychological factors (e.g., anxiety, expectations and coping style), and physical factors (e.g., fatigue), are theorised to modulate the perception of symptoms, as well as self-report. According to the model, this may lead to persistent PCS in the absence of ongoing neurological pathology. Within this framework, PROMs are conceptualised as indices of subjective symptom burden rather than direct measures of neural dysfunction.

From a measurement theory perspective, interpretation of PROM data is dependent upon the extent to which scale items reflect a clear latent construct or multiple related constructs. Both Classical Test Theory (CTT) and Item Response Theory (IRT) generally assume that total scores are most defensible psychometrically when a measure reflects a single underlying construct (i.e., unidimensional) or when a dominant general factor is present (Mokkink et al., 2010).

CTT conceptualises observed scores as the sum of a true score and measurement error, and evaluates measurement quality primarily through statistics such as internal consistency, reliability and factor structure (DeVellis, 2006). In contrast, IRT models the relationship between individual item responses and an underlying latent trait, allowing examination of item-level functioning and measurement precision across different levels of the construct (Nguyen et al., 2014; Reise & Waller, 2009). Rasch models represent a specific form of IRT that impose more stringent assumptions regarding item invariance and scale functioning, allowing evaluation of whether items operate consistently across individuals and groups (Bond et al., 2020).

Within the COSMIN framework, evidence derived from both CTT and IRT approaches is considered when evaluating measurement properties. However, COSMIN highlights the importance of modern psychometric approaches, such as IRT and Rasch modelling, when evaluating structural validity and measurement invariance, as these allow a more detailed examination of item functioning and scale properties (Mokkink et al., 2018). Establishing structural validity through such approaches is considered an important first-step for interpreting reliability statistics such as Cronbach's alpha which assumes unidimensionality, as it ensures that scale scores validly represent the underlying construct (Mokkink et al., 2010; Monkkink et al., 2018).

Globally, the Rivermead Post-Concussion Symptoms Questionnaire (RPQ; King et al., 1995) is widely used as a PCS PROM across various settings and has been incorporated into clinical guidelines, outcome batteries and large-scale longitudinal research programmes (e.g., CENTRE-TBI; Zeldovich et al., 2022). Despite this, the psychometric properties remain contested; although initially proposed as a single construct to quantify global PCS severity (King et al., 1995), more recent research adopting contemporary psychometric approaches (e.g., Rasch or factor analysis), offer alternative explanations as to whether symptoms are better understood as unidimensional, multidimensional or hierarchically structured (e.g., Eyres et al., 2005; Franke et al., 2015; Vos et al., 2019).

The literature has extended further with the development of advanced methodologies such as bifactor modelling to distinguish between general and domain-specific variance, measurement invariance testing to evaluate comparability of scores across groups or time-points, and generalisability theory (G-theory) to assess multiple sources of measurement error. Overall, the literature highlights the need for a comprehensive review to clarify the internal structure, interpretation of total versus subscale scores, stability of measurement over time and specificity of RPQ scores to mTBI and other related contexts in which the RPQ is

used. Importantly, emerging evidence suggests that the RPQ may demonstrate robust measurement invariance across demographic groups, supporting its use in demographically diverse clinical populations (Vos et al., 2019a).

Although a previous review of PCS measures included the RPQ alongside other PROMs (Alla et al., 2009), no review to date has systematically synthesised the available psychometric evidence base for the RPQ alone, using COSMIN methodology (Mokkink et al., 2010). Given the RPQ's prominence across clinical and research contexts, a methodologically rigorous evaluation of its measurement properties in this way is warranted. In line with current psychometric evaluation, evidence from mixed-severity TBI and non-TBI comparison groups is pertinent for evaluating the measurement properties and interpretability of PCS.

The aim of this review is to systematically evaluate the psychometric properties of the RPQ in TBI and non-TBI comparison groups, using the theoretically grounded COSMIN framework. Given the ongoing debate regarding dimensionality, particular attention is given to evaluate the evidence for multidimensional structures, dominant general factors and unidimensionality.

Method

Design and Registration

The review protocol was registered on PROSPERO (registration number: CRD420250451735) and initially specified a broader scope, aiming to evaluate the psychometric properties of all PCS PROMs. However, during screening, the volume and heterogeneity of the literature identified, necessitated a refinement of scope to ensure methodological rigour and feasibility. The focus was therefore narrowed to the RPQ as it was the most frequently evaluated measure identified and had a sufficiently large and diverse

evidence base to permit a comprehensive COSMIN-aligned appraisal across multiple measurement properties.

Eligibility Criteria

The eligibility criteria were constructed in line with COSMIN guidance.

Study Type

Studies were eligible if they reported original quantitative empirical data, evaluated one or more psychometric properties of the RPQ and used recognised psychometric or statistical methods. Both cross-sectional and longitudinal study designs were eligible, including validation studies and secondary psychometric analyses of cohort data.

Population

Studies were eligible if participants were adults, had sustained a traumatic brain injury of any severity, where inclusion informed psychometric evaluation of the RPQ in mTBI-relevant contexts, or were non-injured comparison samples included for psychometric evaluation purposes (e.g. general population or orthopaedic controls).

Measure

Studies were required to assess the RPQ in its original form. Studies reviewing other forms of the RPQ including the modified version (mRPQ) or translated versions, were excluded to avoid confounding effects related to measure adaptation or adequate translation.

Measurement Properties

Eligible studies assessed at least one measurement property as defined by COSMIN guidelines (Appendix B).

Exclusion Criteria

Studies were excluded if they used the RPQ solely as an outcome measure without psychometric evaluation. Reviews, qualitative studies, case reports, conference abstracts and

non-peer reviewed publications were excluded. Studies were also excluded if they were not available in English.

Search Strategy

A literature search was conducted using MEDLINE, PsycINFO, EMBASE, CINAHL and Web of Science. The search was run in September 2025. Search terms combined keywords relating to the RPQ (Rivermead Post-Concussion Symptoms Questionnaire" or "Rivermead Post Concussion Symptoms Questionnaire" or RPQ) and measurement properties (valid* or reliab* or psychometric* or "measurement propert*" or ("factor analy*" or factor*) or dimensional* or multidimensional* or bifactor* or rasch or ("item response theor*" or IRT) or invariance or "measurement invariance" or "internal consistency" or Cronbach* or omega or ("test-retest" or "test retest") or stability or reproducibility or "measurement error" or ("standard error of measurement" or SEM) or ("minimal detectable change" or MDC) or responsiveness or "longitudinal change"). Variations in search terms required by each database are detailed in Appendix C.

Study Selection

Duplicates were removed from imported records before titles and abstracts were screened against the eligibility criteria. Screening was conducted independently by the primary reviewer. To assess reliability of the screening process, a second reviewer independently screened 20% of titles and abstracts. Inter-rate reliability was calculated using Cohen's Kappa (Cohen, 1960) with substantial agreement between reviewers (Cohen's κ =.70; Landis & Koch, 1977). Discrepancies were resolved through discussion prior to full-text screening.

At this stage, full-texts of all of the papers that were deemed potentially eligible following title and abstract screening were retrieved for further assessment. The primary reviewer assessed all of the papers, with the second-reviewer screening 25%. The reviewers

agreed on all papers, achieving perfect inter-rater reliability $k = 1$, $p < .001$. To ensure completeness of the search, reference lists of included studies and relevant reviews were screened, and a supplementary search was conducted using Google Scholar. The study selection process is illustrated in the PRISMA flow diagram (Figure 1).

Data Extraction

Data were extracted using a structure informed by COSMIN methodological guidance for systematic reviews of patient-reported outcome measures (Mokkink et al., 2018, 2024; Prinsen et al., 2018). COSMIN recommends extracting information relating to study characteristics, sample characteristics, the measurement properties evaluated, and the statistical methods used to assess those properties, in order to enable systematic appraisal of methodological quality and interpretation of findings (Mokkink et al., 2018, 2024; Prinsen et al., 2018). Extracted information included study characteristics (e.g., country, design, setting), sample characteristics (e.g., sample size, age, sex, time since injury), measurement properties and statistical methods. To ensure methodological rigour, a second-rater extracted data from 50% of the included studies for comparison purposes, with disagreements resolved via discussion.

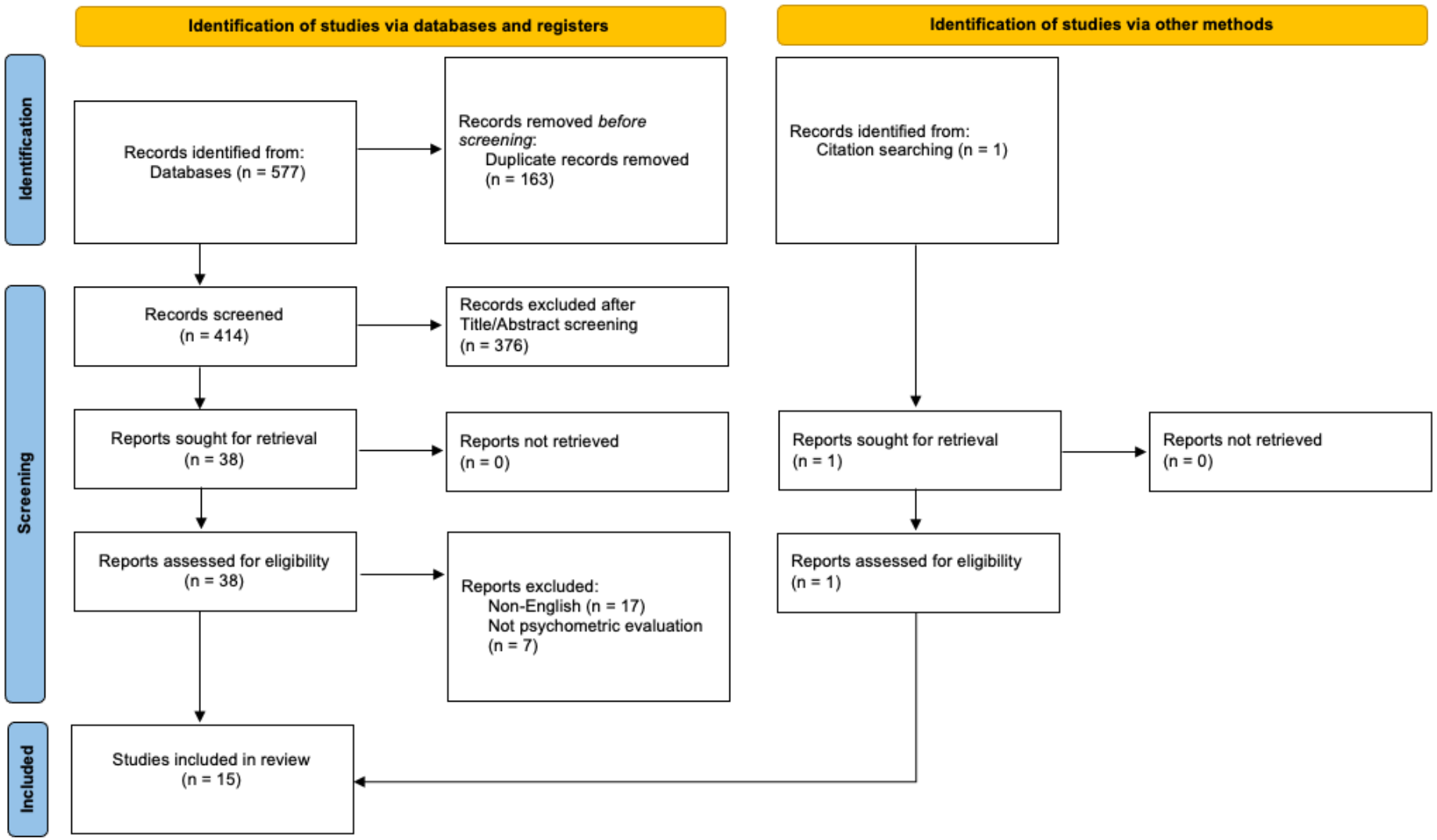


Figure 1. PRISMA flowchart of study selection

Methodological Quality Assessment

The methodological quality of the studies was evaluated using the COSMIN risk of bias checklist for PROMs (Mokkink et al., 2018) which offers a conceptual framework for the assessment of the methodological quality of studies on measurement properties of PROMs in healthcare settings (Appendix B). The checklist is structured around measurement properties and is grounded in CTT and IRT. Each study was systematically reviewed, with measurement properties rated as "*Very Good*", "*Good*", "*Adequate*", "*Doubtful*" or "*Inadequate*" based on guidelines for design and statistical methods. Ratings were therefore only assigned where the property was explicitly evaluated; absence of a rating reflected absence of evidence, rather than poor methodological quality. Each property on the checklist pertains to several specifications, with each scored subsequent to an overall score being attributed to that particular property. Within each property, the "worst score counts" principle was applied to assign overall scores. Fifty percent of the total studies included were second-rated with an independent rating agreement of 100%.

Data Synthesis

Owing to the heterogeneity in study designs, populations, time points and analytical approaches used across the studies, a narrative synthesis was conducted. In accordance with COSMIN, findings were synthesised by measurement property. For each property, evidence gathered across the literature base was summarised with reference to statistical findings, methodological quality, patterns across studies and contextual factors. A meta-analysis was not conducted due to the variability in reporting across the included studies.

Results

Study Selection Results

The database search identified 577 records. After removal of duplicates, 414 records remained for title and abstract screening. Following screening, 38 full-text articles were

assessed for eligibility. Of these, 24 studies were excluded as they did not include evaluation of psychometric properties or were non-English. An additional paper was identified through citation searching. A total of 15 studies met the eligibility criteria and were included in the final review.

Study Selection and Characteristics

Descriptive characteristics are presented in Table 1. The included studies ($N = 15$) were conducted in English-speaking countries, including the USA, United Kingdom, New Zealand, Australia, and Canada. Sample sizes varied widely, ranging from small reliability studies ($n \approx 40$; King et al., 1995) to large multicentre cohort analyses exceeding 1,000 participants (Agtarap et al., 2021). The total cumulative sample across the included studies was $N = 5{,}762$, though it is important to note that this figure represents a study-level total and therefore may overestimate the number of unique participants due to potential cohort overlap across publications (Barker-Collo et al., 2018, 2019; Vos et al., 2019a, 2019b).

Study samples were largely made up of adults with TBI, with mTBI being the most commonly represented severity, although several studies included mixed-severity or chronic samples whilst others included non-injured comparison groups (e.g., orthopaedic controls or general population samples). TBI severity was typically defined in accordance with the World Health Organisation taskforce (Holm et al., 2005). Accordingly, mTBI is characterised by an initial Glasgow Coma Scale (GCS; Teasdale et al., 2014) score of 13-15, and one or more of the following: loss of consciousness (LoC) of less than 30 minutes, Post Traumatic Amnesia (PTA) of less than 24 hours, impaired mental state at the time of accident, transient neurological deficit (Holm et al., 2005).

Study designs varied and included cross-sectional psychometric analyses (Balalla et al., 2020; Eyres 2005; Franke et al., 2015; Hermann et al., 2009; King et al., 1995; Theadom et al., 2023), prospective longitudinal cohorts (Agtarap et al., 2021; Medvedev et al., 2018;

Thomas et al., 2018), and secondary analyses of large registries (Brain Injury Incidence and Outcomes in the New Zealand Community (BIONIC); Barker-Collo et al., 2018, 2019). Time of assessment varied across studies ranging from the acute phase (Agtarap et al., 2021; Barker-Collo et al, 2018; King et al., 1995; Medvedev et al., 2018; Simons et al., 2023; Thomas et al., 2018) through to very long-term follow-up (Barker-Collo et al., 2019; Vos et al., 2019a, 2019b), with several studies explicitly examining the stability of RPQ structure across multiple time points (Agtarap et al., 2021; ; Barker-Collo et al., 2018; King et al., 1995; Medvedev et al., 2018; Simons et al., 2023; Thomas et al., 2018).

Most studies were conducted in hospital-based or trauma-registry settings, with follow-up assessments completed in community, outpatient, home, telephone, or mixed modalities. Where included, comparator instruments comprised measures of quality of life, mood, or symptom burden (Neurobehavioural Symptom Inventory (NSI), Rivermead Head Injury Follow-Up Questionnaire RHFUQ, Sports Concussion Assessment Tool (SCAT)), although many studies evaluated the psychometric properties of the RPQ without external comparators.

Overall, the evidence base reflects methodological and clinical heterogeneity in terms of populations, injury chronicity, and study design, which has implications for the generalisability and comparability of psychometric findings across studies.

Table 1. Study characteristics (N=15)

Study	Country	Study Design	Sample Size (*N*)	Population	Age (M; *SD*)	Sex (% male)	Time since injury	Setting	Measurement properties assessed	Statistical Approach
Agtarap 2021	USA	Prospective longitudinal cohort	1,011	Adults with mTBI (presenting within 24 hours of injury; GCS 13–15; neuroimaging evidence of brain injury)	39.74 (16.7)	65%	2 weeks; 3, 6, 12 months post-injury	Multicentre Level I trauma centres (acute ED recruitment; follow-up in-person/telephone)	Structural validity; internal consistency; measurement invariance	Ordinal appropriate estimation; Exploratory Factor Analysis (EFA); Confirmatory Factor Analysis (CFA); model-based reliability; multi-group CFA
Balalla 2020	New Zealand	Case–control study with cross-sectional follow-up	223 (TBI *n* = 109; Orthopaedic *n* = 114)	Adults with TBI (isolated and multiple-injury TBI) and orthopaedic injury controls, recruited from a regional trauma registry	TBI: 48.8 (19.7); Orthopaedic: 48.0 (19.7)	TBI: 63.3; Orthopaedic: 64.9	Follow-up interviews conducted 6 months–6 years post-injury; mean time since injury (years): TBI 2.5 (0.13); Ortho 2.7 (0.04)	Regional hospital trauma registry (Waikato region); telephone interview follow-up	Structural validity; measurement invariance	Rasch model fit; Differential Item Functioning (DIF)
Barker-Collo 2018	New Zealand	Longitudinal population-based cohort	Baseline *n* = 209; 1-month *n* = 261; 6-month n = 420; 12-month *n* = 527	Adults with WHO-defined mild TBI identified via population incidence study (BIONIC). 95% had mTBI (GCS 13-15 and/or Post-Traumatic Amnesia <24 h.	25.7 (8.3)	42%	Baseline (≤2 weeks), 1 month, 6 months, 12 months post-injury	Community-based follow-up (home / GP practice / university assessment sites)	Structural validity	EFA
Barker-Collo 2019	New Zealand	Cross-sectional long-term follow-up with matched control comparison	mTBI: *n* = 232; Controls: *n* = 232	Adults with WHO-defined mild TBI from population-based incidence cohort (BIONIC) and healthy community controls	Not reported (groups age-matched; no mean/SD provided)	Sex-matched (exact numbers or percentages not reported)	4 years post-injury (±1 month)	Community-based assessment (in person, telephone, or online self-completion)	Structural validity	EFA
Eyres 2005	United Kingdom	Cross-sectional	369	Adults presenting with head injury (predominantly mild–moderate); referred for skull X-ray or under	34.6 (*SD* not reported; range 18–62)	60%	3–6 months post-injury	Two urban teaching hospitals and community-based head injury service	Structural validity; internal consistency (Rasch separation); reliability (test-retest); measurement invariance	Rasch model fit; Person Separation Index (PSI); DIF

				care of community head injury team						
Franke 2015	USA	Cross-sectional	181	Active-duty service members and veterans with blast exposure in the past 2 years (with and without mTBI)	27.6 (7.9)	96%	Median 9 months since most recent blast	Veterans Affairs medical centres and military bases	Structural validity; internal consistency	CFA; EFA; Cronbach's alpha
Herrmann 2009	Canada	Observational, cross-sectional clinical cohort	200 (non-depressed *n* = 104; depressed *n* = 96)	Adults with mild-to-moderate TBI; depression status defined via Structured Clinical Interview for DSM-IV (SCID) (major depression-like episode or depressive features)	Non-depressed *n* = 37.5 (17.8); Depressed: *n* = 37.2 (16.3)	Non-depressed: 67%; Depressed: 56%	113.6 days (SD 92.7)	TBI Clinic; referrals from ED/trauma wards and GP	Structural validity	EFA
King 1995	UK	Cross-sectional design; two-condition reliability study	Study 1: *n*=41; Study 2: *n*=46	Adults with mild–moderate head injury (median PTA of 1 hour)	Study 1: 31 (14.3); Study 2: 34 (13.2)	Study 1: 54%; Study 2: 68%	Study 1: first RPQ at ~7–10 days post-injury (mean 8 days), retest ~24h later (mean 1.6 days later); Study 2: first RPQ at ~6 months post-injury (mean 6 months 6 days), second ~7–10 days later (mean 9 days)	Community/home follow-up (home visits)	Reliability: test–retest (Study 1) and inter-rater (Study 2), for total score and individual items	Spearman correlations
Medvedev 2018	New Zealand	Longitudinal cohort	145	Adults with mild TBI (GCS 13–15 and/or PTA <24h) from the BIONIC incidence/outcome study	39.7 (18.0)	59%	Baseline within 1 month, then 6 months, 12 months post-injury	Community/population-based ascertainment (Hamilton & Waikato regions); assessments completed in-person at home or mutually convenient community locations	Reliability; internal consistency	Generalisability Theory G-coefficient; ICC; Cronbach's α,

Potter 2006	UK	Observational cohort (routine follow-up)	168	Adults with traumatic head injury admitted via Accident & Emergency / trauma wards; predominantly mild TBI (89% PTA <24h)	35.2 (14.3)	58%	~6 months post-injury	Community follow-up assessment in person (home/outpatient) or by telephone	Structural validity	CFA comparing 1-, 2-, 3-factor models
Simons 2023	USA	Secondary analysis of prospective cohort data; psychometric linking study	396 (Sport-related mTBI n = 104; Civillian mTBI n = 75; Orthopaedic n = 79; non-injured control n = 138)	Mixed sample: sport-related concussion, civilian mTBI, orthopedic injury controls, non-injured athlete controls. mTBI group: (LOC; <30 minutes, PTA) <24 hours; documentation of focal neurologic deficit; initial Glasgow Coma Scale score 13-15.	Full sample: 30.2 (19.2)	84%	Acute: median 2 days post-injury (civilian); 24–48 hours post-injury (sport-related)	Level-1 trauma centre inpatient unit (civilian); high-school/collegiate sport settings (athletes)	Structural validity; measurement invariance	EFA; CFA; bifactor CFA; omega hierarchical; fixed-parameter IRT (graded response model); population invariance testing (RMSD)
Thomas 2018	Australia	Psychometric observational study (longitudinal follow-up subsamples)	661 (mild n = 508; moderate n = 100; very severe n = 35)	Adults with traumatic brain injury recruited via Neurotrauma Register of Tasmania. Severity defined by PTA: Mild <24 hours; Moderate 1-7 days; Very Severe 1-4 weeks	37.0 (17.6)	64%	RPQ completed ~1 month post-injury (mean 30.35 days, SD 4.80); follow-up subsamples at 3, 6, 12 months	Hospital-based and community follow-up	Structural validity; internal consistency	EFA; CFA; Bootstrapped model fit indices; Cronbach's α
Theadom 2023	New Zealand	Cross-sectional observational study (routine health-screen data extraction)	363	Adult prisoners (men) with and without self-reported lifetime TBI history – as classified by WHO	TBI group = 34.8; Non-TBI group = 36.8 (SD not reported)	100%	Not reported; lifetime TBI history only	Adult male correctional facility (South Auckland Correctional Facility)	Structural validity; Internal consistency	Principal Component Analysis (PCA) with varimax rotation; Cronbach's α
Vos 2019a (Rasch)	USA	Prospective cohort observational study	497	Community-dwelling adults with mild–severe traumatic brain injury	38.2 (13.3)	75%	6.2 (6.8) years	Three acute inpatient rehabilitation hospitals; post-discharge community follow-up	Structural validity; reliability (IRT-based); measurement invariance	Rasch analysis (item fit; dimensionality testing); person and item separation

										indices; differential item functioning (DIF)
Vos 2019b (NSI)	USA	Prospective cohort observational study	497	Community-dwelling adults with traumatic brain injury (mild–severe)	38.2 (13.3)	75%	6.2 (6.8) years	Three acute inpatient rehabilitation hospitals; post-discharge community follow-up	Structural validity, internal consistency	EFA; Cronbach's α

Risk of Bias and Methodological Quality Assessment (COSMIN)

Overall, for structural validity, several studies demonstrated *Very Good* methodological quality through confirmatory or item-response–based analyses (Agtarap et al., 2021; Eyres et al., 2005; Potter et al., 2006; Simons et al., 2023; Thomas et al., 2018a; Vos et al., 2019a). Studies were downgraded in this domain for reasons such as reliance on exploratory methods, small samples, or limited reporting (Balalla et al., 2020; Barker-Collo et al., 2018, 2019; Franke et al., 2015; Herrmann et al., 2009; Theadom et al., 2023; Vos et al., 2019b) indicating moderate risk of bias across the wider evidence base.

For internal consistency, risk of bias was generally *Adequate*, most commonly where reliability coefficients were reported but dimensionality was not first established. Only two studies achieved *Very Good* ratings by reporting internal consistency alongside robust structural validation (Agtarap et al., 2021; Eyres et al., 2005).

Evidence for measurement invariance was limited, with one study rated *Very Good* (Agtarap et al., 2021) and the remaining rated as *Adequate*, reflecting limited subgroup testing and an overall uncertain risk of bias. Reliability (test–retest or G-theory) was infrequently assessed and rated as *Adequate* in three of the four studies. Measurement error, content validity, and responsiveness were unexamined in a COSMIN-aligned manner.

Overall, the COSMIN appraisal (Table 2) indicated lowest risk of bias for structural validity**,** but moderate to high risk of bias or absence of evidence across most other measurement properties, highlighting key gaps in the psychometric evaluation of the RPQ.

Table 2. COSMIN Risk of Bias Ratings

Study	Content validity	Structural validity	Internal consistency	Measurement invariance	Reliability (test–retest / G-theory)	Measurement error	Construct validity (hypothesis testing)	Responsiveness
Agtarap 2021	—	Very good	Very good	Very good	—	—	—	—
Balalla 2020	—	Adequate	—	Adequate	—	—	—	—
Barker-Collo 2018	—	Doubtful	—	—	—	—	—	—
Barker-Collo 2019	—	Doubtful	—	—	—	—	—	—
Eyres 2005	—	Very good	Very good	Adequate	Adequate	—	—	—
Franke 2015	—	Doubtful	Adequate	—	—	—	—	—
Herrmann 2009	—	Doubtful	—	—	—	—	—	—
King 1995	—	—	—	—	Adequate	—	—	—
Medvedev 2018	—	—	Adequate	—	Very Good	—	—	—
Potter 2006	—	Very Good	—	—	—	—	—	—
Simons 2023	—	Very Good	—	Adequate	—	—	—	—
Thomas 2018	—	Very good	Adequate	—	—	—	—	—
Theadom 2023	—	Doubtful	Adequate	—	—	—	—	—
Vos 2019a (Rasch)	—	Very good	—	Adequate	Adequate	—	—	—
Vos 2019b (NSI)	—	Doubtful	Adequate	—	—	—	—	—

Narrative Synthesis

Analyses are organised to reflect the logical dependencies between measurement properties: first establishing what the RPQ measures (structural validity and dimensionality), then evaluating the coherence of scores within that structure (internal consistency), followed by the examination of score stability and precision (reliability and measurement error), and finally considering the limits of external validity, interpretability, and responsiveness. This ordering reflects the principle that reliability and validity can only be meaningfully interpreted once the latent structure of a measure is established (Mokkink et al., 2010, 2018).

What does the RPQ measure? Latent structure and dimensionality

Structural validity refers to the degree to which scores from a measure reflect the dimensionality of the construct being assessed. Establishing the latent structure of the RPQ is therefore an important first-step for interpreting other psychometric properties.

Across the studies, the evidence predominantly suggests that the RPQ does not appear to measure PCS as a single dimension. Instead, findings support a multi-dimensional symptom profile, with an overall symptom burden alongside smaller, clinically meaningful symptom domains. The influence of these components varies by time since injury, population and analytic approach.

Evidence for multidimensional symptom structure. Across clinical and population-based samples, studies employing factor analysis most commonly identified multiple RPQ symptom domains, typically separating cognitive–emotional, somatic/physical, and visual/vestibular symptom clusters. Strong evidence for this multidimensional structure was provided by large clinical samples assessed across time-points following TBI. For example, Thomas et al. (2018) (n = 661), report in a four-factor structure (Mood/Somatic, Cognitive, Vertigo, Vision) using split-sample EFA and CFA, with superior fit relative to one-, two-, and three-factor solutions and stability across follow-up at 3, 6, and 12 months.

Similarly, in a UK sample assessed approximately six-months post-injury, poor fit for one-factor model was reported whilst acceptable fit was reported for both two- and three-factor solutions (Potter et al., 2006). Although emotional and somatic factors were highly correlated, cognitive symptoms consistently emerged as a distinct domain. It is important to note however, the study was constrained by methodological limitations including the modest sample size (n = 168) and use of maximum likelihood estimation for ordinal data, however, these limitations do not undermine the overall conclusion regarding the multi-dimensionality of the RPQ.

Further support is provided by outpatient clinic samples with Herrmann et al. (2009) reporting a three-factor structure comprising mood/cognitive, general somatic, and visual-somatic domains. Though the analysis utilised exploratory methods and the factor structure was derived from a depression-defined subgroup, downgrading its COSMIN rating. The identification of a distinct visual-somatic cluster is consistent with higher quality evidence using factor analytic and bifactor evidence demonstrating a distinct visual or visuo-vestibular cluster (Agtarap et al., 2021; Hermann et al., 2009; Thomas et al., 2018).

Evidence for multidimensionality was also evident in non-clinical samples; for example, Theadom et al. (2023) reported a two-factor structure (cognitive–emotional–behavioural and visuo-ocular) in a forensic sample (n = 363), suggesting that symptom clusters are also observed in non-clinical contexts, although notably the study employed exploratory PCA rather than confirmatory modelling.

Collectively, these studies suggest that the RPQ symptoms cluster into multiple, clinically meaningful domains. Across populations and analytic approaches, cognitive and emotional symptoms frequently cluster, somatic symptoms variably overlap with emotional distress, and visual or vestibular symptoms often form a distinct, albeit less stable cluster.

Together, the pattern of evidence argues against the conceptualisation of the RPQ as a single undifferentiated symptom scale.

Competing structural models and the role of a general factor. Whilst the evidence suggests that RPQ symptoms cluster into multiple domains, methodologically stronger studies indicate that responses are largely driven by a dominant general factor with subordinate symptom domains. For example, in a large mTBI sample assessed from 2 weeks to 12 months post injury (n = 1,011), Agtarap et al. (2021) reported that a four-factor model comprising a general symptom factor alongside emotional, cognitive and visual domains, fit the data well across the recovery trajectory, whereas a single-factor model fit poorly. This evidence suggests that the RPQ total scores predominantly reflect overall symptom burden during early and subacute recovery, with subscale scores capturing smaller but domain-specific variance. This may be consistent with conditional unidimensionality, whereby a dominant general factor explains the majority of variance with subordinate symptom domains offering smaller but still clinically meaningful contributions.

Barker-Collo et al. (2019) also provided evidence for a dominant general factor in a mTBI sample 4 years post injury and matched community controls (n = 464). They reported a three-factor model in both groups, though a single factor accounted for the majority of variance in both groups, with secondary factors accounting for less than 10% each and showing instability across samples. Factor structures were similar between the two groups suggesting that in chronic mTBI, RPQ responses may reflect a non-specific general symptom factor rather than PCS-specific.

Overall, these findings suggest that the balance between general and domain-specific symptom variance is both time and population dependent. Specifically, in early recovery following mTBI, conditional unidimensionality with meaningful subordinate domains is supported (Agtarap et al., 2021). Whilst in chronic or non-clinical samples, RPQ scores are

dominated by a general symptom burden, limiting interpretability of subscales (Barker-Collo et al., 2019).

Conditional unidimensionality and Rasch-based findings. Rasch analyses offer important insight into when unidimensional scoring of the RPQ is appropriate, highlighting the influence of symptom timing, item dependence and composition.

In a UK study conducted 3-6 months post injury (n = 369), Eyres et al. (2005) reported that the full 16-item RPQ did not fit a unidimensional Rasch model, suggesting that the scale should not be treated as measuring a single construct. Several items showed poor fit and residual multidimensionality, providing evidence against the utility of a single RPQ total score. However, following Rasch re-analysis, unidimensionality was achieved following theoretically meaningful item separation. Specifically, the authors found that removing early somatic symptoms (e.g., headache, dizziness, nausea) resulted in a unidimensional RPQ-13. The somatic items removed, formed a distinct unidimension (RPQ-3), presenting an early- and late-symptom division. This provides evidence for the change in symptom structure over time and aligns with later longitudinal findings.

A New Zealand-based study assessing a sample of orthopaedic controls and mixed severity TBI approximately 2.5 years post-injury (n = 223) provided evidence that the RPQ may appear unidimensional at a later stage of recovery (Balalla et al., 2020). Though they initially reported poor fit of the full RPQ due to local item dependence (LID; i.e., when some questionnaire items are more closely related to each other than they should be). To address measurement error arising from LID, “super-items” were aggregated, supporting a unidimensional solution. The study employed rigorous Rasch analytic approach and suggests that unidimensional scoring is possible; however reliance on “super-items” indicates that it is conditional on specific modelling conditions.

Alternatively, Vos et al., (2019a) used Rasch analyses in a US sample of adults who had sustained a TBI on average 6 years prior (n = 497) to support a multidimensional interpretation. They reported four domains: cognitive, mood, physical and visual, with domain-level unidimensionality supported after item refinement. This contrasts earlier findings, suggesting that even in chronic phases, RPQ symptoms may not fully collapse into a single latent dimension.

Taken together, Rasch-based evidence suggests that unidimensionality scoring of the RPQ is not a stable property of the measure, but may emerge dependent upon symptom composition, time since injury and how LID is managed.

Structural generalisability across populations. Evidence for structural generalisability across populations was mixed. Though broad patterns of multi-dimensionality were observed across clinical and control samples, factor structures did not remain consistent across populations or recovery stages. For example, in a predominantly male blast-explosion military sample assessed at a median of 9 months post-injury (n = 181), CFA indicated that a three-factor model, previously evidenced in a community sample (Potter et al., 2006), showed poor fit. This may suggest limited generalisability to blast-injury contexts. EFA suggested a four-factor solution however, the lack of confirmatory testing limited confidence under COSMIN.

Longitudinal population-based evidence using a mTBI sample (n = 527) further supports the dynamic nature of the RPQ over time indicating time-dependent generalisability. Barker-Collo et al., (2018) reported a cluster shift from an initial three-factor structure in early recovery to a stable two-factor structure by six months post-injury, challenging the assumption of a fixed RPQ structure across PCS recovery.

Studies employing Rasch-based DIF analyses across age, sex, and injury characteristics identified little evidence of meaningful item bias (Balalla et al., 2020; Eyres et

al., 2005; Vos et al., 2019a). However, these findings do not establish whether RPQ scores or subscales are comparable across groups at the scale level, this would require multi-group confirmatory invariance testing.

Overall, the evidence for structural validity suggests that whilst the RPQ shows consistent multidimensional patterns, its latent structure does not generalise homogenously across populations or stages of recovery. Therefore, subscale scores should be interpreted with caution outside of validated contexts.

Can RPQ symptom domains be measured coherently? Internal consistency

Internal consistency refers to the degree to which items within a (sub)scale are interrelated and measure the same construct. Under COSMIN, internal consistency can only be meaningfully interpreted when unidimensionality or a scoring model has been established for the score that is being evaluated.

Internal consistency was COSMIN-interpretable in seven included studies; additional studies proposed factor structures (Barker-Collo et al., 2018, 2019; Potter et al., 2006; Hermann et al., 2009; Vos et al., 2019a) though did not report internal consistency indices. Across the studies where internal consistency could be evaluated, the total RPQ score demonstrated greater internal coherence as an index of overall symptom burden than at the domain level (Agtarap et al., 2021; Eyres et al., 2005; Thomas et al., 2018). Reliability for visual/vision and vestibular/vertigo domains was comparatively weaker and more variable across analytic approaches and population samples (Franke et al., 2015; Theadom et al., 2023; Thomas et al., 2018).

The strongest evidence came from studies that assessed internal consistency within explicitly tested dimensional structures. In the large TRACK-TBI study (Agtarap et al., 2021), the mTBI sample were assessed between 2 weeks and 12 months post-injury (n = 1,011) with the authors reporting very high reliability for the dominant general factor derived

from bifactor confirmatory analysis (ω ≈ .96–.98; ωH ≈ .93–.95; Explained Common Variance (ECV) ≈ 82–87%). The findings suggest that RPQ total scores may largely reflect a common symptom-severity dimension whilst reliability for domain-specific factors was substantially lower, therefore indicating that subscales should be interpreted with caution.

Rasch-based studies reported Person Separation Index (PSI) as indicators of score reliability; however in line with COSMIN, internal consistency was only considered interpretable when unidimensionality assumptions were met. For example, in a case-control study conducted in New Zealand, Balalla et al. (2020) assessed TBI and orthopaedic control groups approximately 2.5 years post-injury; they reported a PSI of 0.87. However, significant item misfit and item–trait interaction suggested that the RPQ did not meet Rasch model expectations, therefore limiting interpretation of PSI as evidence of internal consistency under COSMIN criteria. In contrast, in a UK-based study 3-6 months post-TBI, strong PSI values were reported for the refined RPQ-13 (PSI = 0.95) and acceptable reliability for the RPQ-3 (PSI = 0.81), providing evidence that reliability improves when scoring aligns with dimensionality.

Alpha-based estimates and domain-level patterns. Three studies reported Cronbach's alpha for subscales (Franke et al., 2015; Theadom et al., 2023; Thomas et al., 2018), two of which used EFA or CFA. In a large Australian cohort, assessed approximately one month post-injury (n = 661), Thomas et al. (2018) reported good internal consistency for Mood/Somatic and Cognitive factors (α ≈ .88–.91), acceptable values for Vertigo (α ≈ .71–.77), and more marginal estimates for the Vision factor (α ≈ .61–.74). A similar pattern was demonstrated in a military sample assessed at a median of nine months post-injury (n = 181), with strong internal consistency for Emotional (α = .89) and Cognitive (α = .90) factors and lower coefficients for Visual (α = .71) and Vestibular domains (α = .62) (Franke et al., 2015). In a custodial sample (n = 363) in New Zealand, Theadom et al. (2023) reported good

internal consistency for a two-factor solution (cognitive, emotional, behavioural factor α = .94; visuo-ocular factor α = .81). However, the factors were derived using exploratory PCA rather than EFA or CFA and were not independently confirmed, therefore limiting interpretation of these subscales.

When internal consistency was not COSMIN-interpretable. Some studies reported high Cronbach's alpha values without first establishing a scoring model that would justify interpreting alpha as evidence of a unidimensional scale. For example, Medvedev et al. (2018) reported consistently high alpha values across occasions (α ≈ .94–.95) in a longitudinal mTBI cohort (*n* = 145), but the focus of the analysis was on generalisability theory and trait-state decomposition rather than specifically testing a unidimensional model. In a similar vein, Simons et al. (2023) reported high alpha for a combined RPQ and Sports Concussion Assessment Tool (SCAT) item, which supports the rationale for a pooled symptom construct but does not provide evidence for internal consistency of the RPQ in isolation. Furthermore, Vos et al. (2019b) also reported high alpha for RPQ total-score, in a chronic community sample (*n* = 497); however structural analyses indicated dimensionality concerns which cannot be resolved by alpha alone.

Overall, the evidence for internal consistency is in support for the RPQ total score as an index of overall symptom burden, particularly where a dominant general factor is established using bifactor or Rasch methods. In comparison, internal consistency for domain scores is less consistent, with visual/vision and vestibular/vertigo clusters showing the weakest and most context-sensitive coefficients (Franke et al., 2015; Thomas et al., 2018). Studies demonstrated high alpha values alone do not resolve dimensionality concerns, supporting COSMIN guidance that internal consistency should be interpreted in the context of structural validity.

Are RPQ scores stable and precise? Reliability and measurement error

Reliability refers to how replicable scores are under stable conditions, whereas measurement error reflects random error not attributable to true change. Evidence for reliability was limited and heterogeneous, and there was an absence of COSMIN-aligned evidence for measurement error.

Short-interval reproducibility of the RPQ total score was generally good. King et al's (1995) seminal study reported very high short-term test–retest correlations for the total score ($R_s \approx .91$) in the acute phase (7-10 days post-injury), with greater variability at the item level. At later follow-up (~6 months), inter-rater reliability of the total score remained high ($R_s \approx .87$). While supportive, COSMIN notes that correlation coefficients are not optimal reliability indices and may be inflated over short retest intervals.

Eyres et al. (2005) provided evidence for subscale stability, reporting strong short-term stability for the RPQ-13 ($r = .89$) and acceptable stability for the RPQ-3 ($r = .72$), suggesting improved reliability when the RPQ is scored by subscale. In contrast, longer-interval stability was more modest; in a mTBI sample followed over 12 months, Medvedev et al. (2018) reported moderate test–retest reliability (ICC = .63), likely reflecting both symptom change and item-level instability. However, generalisability theory analyses in the same study demonstrated very high dependability of aggregated RPQ total scores across patients and time-points ($G \approx .98$), indicating that the RPQ functions more reliably as an index of enduring symptom burden than as a sensitive measure of short-term change. Though it is important to note that just 17% of the full cohort ($n = 145$) provided data across all three time-points and were included in the analysis.

Formal measurement error indices were not reported by any of the studies, limiting interpretation of change scores. Rasch and IRT analyses provided information on score precision but did not quantify change over time.

Although the pool of evidence is limited, overall, RPQ total scores show reasonable short-term reproducibility and high generalisability as indices of enduring symptom burden, while evidence for precise individual-level change detection remains limited.

Limits of external validity and score interpretation

Under COSMIN, construct validity, criterion validity, and responsiveness require hypothesis-driven testing, with criterion validity additionally requiring comparison against an appropriate reference. Across the included studies, COSMIN-aligned evidence was not presented for these properties. Though some studies reported associations between RPQ scores and measures of psychological distress or quality of life (Balalla et al., 2020; Eyres et al., 2005; Vos et al., 2019b), analyses were correlational and lacked a priori hypotheses, and therefore did not meet COSMIN criteria for construct validity. Criterion validity was not evaluated by any of the included studies. Although some longitudinal studies (Agtarap et al., 2021; Barker-Collo et al., 2018; Medvedev et al., 2018; Thomas et al., 2018) reported changes in scores over time, evidence was not COSMIN-compliant as formal responsive analyses were not reported. Overall, the evidence indicates that RPQ total scores are better suited to capture overall symptom burden than precise short-term change.

Discussion

Summary of principal findings

This review evaluated the psychometric properties of the RPQ using COSMIN methodology, with particular emphasis on structural validity, reliability and the interpretability of scores across populations and recovery stages. Across the included studies, the methodologically strongest and most consistent evidence concerned the latent structure of the RPQ; with multiple analytic approaches including confirmatory, bifactor and Rasch-based analyses, converging on the conclusion that the RPQ may not operate as a simple unidimensional measure of PCS. The evidence was instead, in support of a pattern of

conditional unidimensionality, characterised by a dominant general symptom factor accompanied by subordinate symptom domains.

The evidence for internal consistency was strongest for the RPQ total score as a measure of overall symptom burden, particularly when dimensionality was clearly modelled. Reliability for domain-level scores, especially visual/vision and vestibular clusters, was weaker and more variable in response to analytic approach and population. The evidence for reliability was limited and methodically heterogenous, whilst COSMIN-aligned evidence for other measurement properties such as criterion validity, construct validity and responsiveness was absent. Therefore, limiting conclusions about the RPQ's suitability for diagnostic use and monitoring clinically meaningful change over time.

Overall, the literature indicates that the RPQ may be best conceptualised as a descriptive measure of overall symptom burden. Currently, there is a scarcity of COSMIN-compliant evidence evaluating responsiveness, and formal measurement error parameters are unavailable. Additionally, the evidence base suggests that the latent structure of the RPQ changes across recovery, undermining the comparability of scores longitudinally.

Interpretation of structural validity: what does the RPQ measure?

The main contribution of the present review was synthesising the evidence for what the RPQ measures psychometrically. Across clinical and non-clinical samples, structural analyses consistently indicated that PCS symptoms are not readily conceptualised as a single factor. Instead, symptoms cluster, typically into cognitive-emotional, somatic and visuo-vestibular domains, though the number and composition of these factors varied by population and time-since injury.

Higher quality studies using contemporary bifactor and Rasch analyses, demonstrated that this multidimensionality exists in tandem with a dominant general factor. The evidence suggests that in early and subacute recovery after mTBI, RPQ responses may be better

characterised by a general symptom severity dimension with smaller domain-specific components. This supports the interpretation of the total score as an index of overall symptom burden. However, across time, in both clinical and non-clinical samples, domain-specific variance appears to reduce, with RPQ scores increasingly dominated by a general symptom factor (Agtarap et al., 2021; Balalla et al., 2020; Eyres et al., 2005); raising concerns about the interpretability and clinical utility of subscale scores in long-term follow-up.

In summary, the findings challenge the common clinical and research practices that assume the RPQ subscales represent stable constructs across the PCS trajectory. In contrast to the assumption of a fixed latent structure, the evidence instead suggests that the RPQ dimensionality is dependent upon context and recovery-phase.

Reliability, coherence, and the limits of precision

In line with the structural findings, the evidence for internal consistency was strongest for the RPQ total score and weaker for individual symptom domains. Studies that explicitly modelled dimensionality, particularly those that employed bifactor CFA or Rasch approaches, reported good reliability for the general symptom factor. Though Cronbach's alpha estimates for visual and vestibular domains were often marginal, which may reflect limited item coverage and instability of these symptom clusters across varying population groups.

There was limited data for score stability over time. Studies with short-intervals between administration suggested good reproducibility of total RPQ scores, particularly in early recovery (King et al., 1995) though estimates of longer-interval stability were moderate. Generalisability theory analyses provided support for the RPQ as a reliable measure of enduring symptom burden than as a tool sensitive to short-term symptom change (Medvedev et al., 2018). Clinically, the distinction suggests that the RPQ may be useful for summarising

overall symptom load but is less suited for monitoring change or response to treatment, in isolation without additional outcome measures.

The lack of formal measurement error indices (e.g., Smallest Detectable Change (SDC) or Standard Error of Measurement (SEM)) constrains the interpretation of change scores. Without such considerations, it remains unclear as to whether observed score changes reflect meaningful clinical change or are simply measurement noise.

External validity, specificity, and responsiveness

Despite its widespread use in both clinical and research settings, COSMIN-compliant evidence pertaining to construct validity, criterion validity and responsiveness for the RPQ was limited. Though some studies reported correlations between RPQ scores and other PROMs, analyses did not offer a priori hypotheses or employ comparator instruments with a clear theoretical model of PCS. Therefore, the construct specificity of the RPQ remains unestablished according to the body of literature synthesised in the present review.

In the wider literature, evidence resembling criterion validity was limited to item-level analyses (e.g., depression screening using the RPQ-D; Rolin & Davis, 2025), which, while clinically helpful, did not meet COSMIN criteria and therefore was excluded from the present review. Known-groups comparisons demonstrated group-level discrimination in some studies (Balalla et al., 2020; Barker-Collo et al., 2018) but were not hypothesis-driven.

Although several longitudinal studies were included in the review (Agtarap et al., 2021; Barker-Collo et al., 2018, 2019; Eyres et al., 2005; Medvedev et al., 2018; Thomas et al., 2018; Vos et al., 2019a, 2019b), none employed responsiveness analyses in line with COSMIN guidance, for example, hypothesis-driven change testing. In combination with generalisability findings, this highlights the need to assess the RPQ's suitability as a rehabilitation monitoring tool.

COSMIN shaped the interpretation of findings, with validity and reliability considered in relation to established dimensionality. Owing to this, COSMIN prevented over-interpretation of coefficients reported without a proven scoring model; a prevailing issue in the RPQ literature. At the same time, the conservative nature of COSMIN meant that some forms of evidence commonly used in clinical contexts, such as correlational analyses were excluded from formal synthesis. These findings are therefore considered contextually rather than as evidence, reflecting the distinction between measurement validity and practical clinical utility.

Strengths and limitations

A key strength of this review is its structured and theory-driven synthesis of the psychometric evidence across diverse populations, recovery stages and analytic approaches. Through synthesising evidence from CTT, bifactor modelling, Rasch analysis and generalisability theory, the review provides an integrated account of how RPQ measurement properties vary in accordance with factors such as time since injury. This method allowed for triangulation of evidence and reduced reliance on any single analytic approach, therefore strengthening confidence in conclusions drawn. Further, the organisation of results according to the COSMIN hierarchy of measurement properties, served to mitigate overreliance on reliability estimates without first establishing an appropriate scoring model. Evaluating the evidence in such a structured way clarified where the evidence is strongest (e.g., latent structure) and where it remains limited (e.g., responsiveness).

However, the conservative nature of COSMIN means methodological rigour is prioritised over clinical pragmatism. As such several types of evidence, for example, correlational analyses with related constructs, screening accuracy of individual items, and changes in mean scores over time, are not COSMIN-aligned and therefore cannot be interpreted for construct validity, criterion validity or responsiveness. Although this limits

conclusions, findings may still have clinical relevance in practice. The methodology therefore highlighted the tension between psychometric standards and real-world clinical use.

The review is limited by the small number of studies meeting the eligibility criteria and the heterogeneity present amongst them, in terms of design, sample, time of assessment and analytic approaches. Therefore results are narrative rather than statistically pooled via a more robust quantitative synthesis or meta-analysis. Additionally, many of the studies were not designed to evaluate psychometric properties in line with COSMIN, limiting the availability of several measurements. In particular, the absence of COSMIN-compliant evidence for key measurement properties such as content validity, construct validity, criterion validity and measurement error limits the interpretability of RPQ scores. Content validity is considered the most fundamental measurement property within COSMIN because it determines whether the items adequately capture the construct of interest (Terwee et al., 2018). Without this evidence, it remains uncertain whether the RPQ comprehensively represents the full range of PCS experiences (Mokkink et al., 2025; Terwee et al., 2018). Similarly, the lack of hypothesis-driven construct validity testing restricts conclusions about whether RPQ scores behave in theoretically expected ways in relation to other clinical measures (Mokkink et al., 2010). The absence of measurement error parameters, such as the Standard Error of Measurement or Smallest Detectable Change, also prevents determination of whether observed score changes represent meaningful clinical change or measurement variability (Mokkink & Eekhout, 2026). Finally, the lack of criterion validity evidence limits conclusions about how RPQ scores relate to external indicators of PCS severity (Mokkink et al., 2010). Collectively, these gaps mean that although the RPQ appears useful descriptively, the precision and interpretability of its scores remain incompletely established.

The exclusion of non-English versions of the RPQ restricts generalisability and prevents conclusions being drawn about cross-cultural validity or measurement invariance.

Though this was an intentional limit to the eligibility criteria, to reduce ambiguity regarding translation and interpretation nonetheless, it narrows the scope of generalisability. Finally, publication bias may prevail as studies reporting null or unfavourable psychometric findings may not be readily available in the published literature.

Clinical and research implications

From a clinical perspective, the findings largely support use of the RPQ total score as a broad index of symptom burden, particularly in early recovery and in contexts where a general severity marker is needed, but not as a diagnostic indicator of PCS pathology. However, interpretation of subscale scores, particularly visual and vestibular domains, should also be approached with caution, given the inconsistent structural support and weaker reliability across groups and recovery.

Importantly, the findings also highlight the necessity of applying clinical judgement when interpreting RPQ scores. Given the non-specific nature of PCS symptoms and their overlap with other psychological and medical conditions, RPQ scores should not be interpreted in isolation. Instead, they should be considered alongside clinical history, neurological findings, and broader psychosocial context. Changes in RPQ scores may reflect fluctuations in mood, fatigue, stress, or other contextual factors and should not be considered to reflect direct changes in neurological functioning. Therefore, while the RPQ can provide a useful structured summary of symptom burden, clinical interpretation remains essential to determine the relevance and meaning of reported symptoms for individual patients.

From a research perspective, the findings highlight an important gap between the widespread use of the RPQ and the limited psychometric data supporting its most common uses. Therefore future research may benefit from explicitly testing dimensionality prior to reporting reliability estimates, developing COSMIN-compliant construct validity hypotheses, conducting formal responsiveness analyses rooted in other indicators of clinically meaningful

change, and reporting measurement error indices to support interpretation of change in scores over time.

Conclusion

This review used COSMIN methodology to synthesise the available evidence for the psychometric properties of the RPQ. Across the heterogenous literature, the most consistent evidence concerned structural validity. The evidence suggested that the RPQ may be better characterised by conditional unidimensionality with a dominant general symptom factor alongside smaller symptom domains. Internal consistency and reliability were strongest for the total score, supporting its use as a broad index of overall symptom burden while evidence for domain-level interpretation, responsiveness and measurement error remains limited. Collectively, the evidence highlights that whilst the RPQ has practical clinical value for describing overall symptom load, further COSMIN-aligned research is needed to establish its utility in monitoring clinically meaningful change over time.

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Service Improvement Project: Evaluating The Perceived Impact of Anti-Racism Training at The Oxford Institute of Clinical Psychology Training and Research

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Proposed Journal: Cultural Diversity & Ethnic Minority Psychology. This journal publishes research pertaining to applied psychological issues relevant to racial and ethnic groups that have been historically underrepresented.

Abstract

Background: Anti-racism training is increasingly implemented within clinical psychology training programmes; however, there is limited evidence regarding how such training influences practice.

Aims: This service improvement project explored course tutors' perceptions of an anti-racism training programme delivered within the Oxford Institute for Clinical Psychology Training and Research (OxICPT-R), with the aim of identifying barriers and facilitators influencing whether learning from the training is translated into practice. Importantly, the study focused on perceived impact rather than directly measuring behavioural change.

Method: Eight course tutors who had completed the training participated in semi-structured interviews. Data were analysed using inductive reflexive thematic analysis (Braun et al., 2019; Braun & Clarke, 2019). Following thematic analysis, findings were mapped onto the Capability, Opportunity, Motivation Behaviour (COM-B) model to support interpretation of factors influencing perceived behaviour change.

Results: Five themes were generated: emotional discomfort as a catalyst for anti-racist learning; developing motivation for anti-racist practice; barriers to translating awareness into action; negotiating power and privilege in clinical psychology training; and training structures as enablers or constraints on anti-racist practice. A number of sub-themes were also generated. Participants described increased reflective awareness and ethical motivation following training, but also identified personal and structural barriers that limited the translation of insight into perceived sustained behavioural change.

Conclusions: The findings suggest that while anti-racism training may promote reflection and motivation among course tutors, perceived meaningful behavioural change is influenced by broader structural and relational factors within training environments. Applying the COM-B framework highlighted the importance of enhancing practical capability, creating

opportunities for ongoing reflection, and embedding anti-racism within institutional structures to support sustained change.

Keywords: Anti-racism, Clinical Psychology training, Behaviour Change, COM-B model

Introduction

Background

Clinical Psychologists (CPs) have a wide-reaching impact; beyond patients and clinical services, they also influence training structures and pathways as well as the professional development and wellbeing of Trainee Clinical Psychologists (TCPs). The British Psychological Society's (BPS) Standards for the accreditation of Doctoral programmes in Clinical Psychology (2019) outlines that CPs are expected to not only have an awareness but actively have the skills to work with people from diverse backgrounds. With this in mind, it is important to acknowledge that Whiteness is the normative position within the field. As defined by Critical Race Theory, Whiteness refers to cultural norms, power relations and institutional structures that position the White experience as the societal standard (Delgado & Stefancic, 2017). Training programmes have historically been shaped by Whiteness, including the fundamental theoretical underpinnings, research priorities and demographics (Odusanya et al., 2017). Ultimately, this may have consequences for the types of people that feel welcome into the field and who progress into positions of leadership within the NHS (NHS England, 2023).

Racial Inequality in Access, Retention and Progression

Historically, white applicants have been more likely to be selected for training compared to People of the Global Majority (PoGM) (Turpin & Coleman, 2010) and later offered more opportunities for career progression (Association of Clinical Psychologists UK, 2024; Scior et al., 2016; Tong et al., 2019). More recently, data from Clearing House (2022) indicates that the pattern remains consistent with 75.9% of those offered a training place in 2022 identifying as 'White'. Notably, there has been a longstanding pattern of higher drop-out rates amongst PoGM trainees (Bender & Richardson, 1990); and whilst contemporary

data is limited, qualitative research highlights the continued experience of microaggressions and cultural isolation amongst non-White trainees (Ebubedike et al., 2024; Falcon, 2023).

The literature illustrates that training programmes may inadvertently perpetuate racial inequality despite commitments to diversity and inclusion. There is, therefore, a need to shift from a "non-racist" stance to an active "anti-racist" position. With the difference argued to be a move from the absence of overt prejudice (non-racist) to a behavioural effort to identify, challenge and dismantle racism across interpersonal, institutional and systemic levels (i.e., anti-racism) (Kendi, 2023). Within Clinical Psychology, this would reflect capabilities such as recognising racial power dynamics, acknowledging and responding to microaggressions, culturally informed practice, reflecting on position, and actively challenging inequalities.

The Clinical Psychologists Role within Clinical Training

Beyond clinical practice and pastoral care, within the course training structure, CPs act as Clinical Tutors (CTs) to evaluate TCPs and therefore, have some control over the progression of their training. Power imbalances are therefore inherent, and research shows that trainees from PoGM backgrounds, frequently experience additional layers of complexity in these hierarchical relationships (Ebubedike et al., 2024; Pieterse, 2018; Sue et al., 2007). Trainees may minimise concerns, avoid raising racialised experiences, or feel unsafe highlighting microaggressions due to fear of negative evaluation or consequences (Ebubedike et al., 2024; Constantine & Sue, 2007).

There is a scarcity of research exploring CPs' perspectives on the matter though studies investigating the experiences of PoGM Psychologists suggest that White CPs often fail to engage with issues of race (Ebubedike et al., 2024). This may reflect CPs feeling unprepared, anxious about causing offence or unaware of how Whiteness operates within the space (Constantine & Sue, 2007). Ultimately, the dynamic serves to sustain the racial

imbalance. Therefore, an anti-racist CP must encompass behavioural competence in lieu of reliance on passive values.

Anti-Racism Training Within the Oxford DClinPsy Training Course

In recognition of the prevailing structural issues, the Oxford Institute for Clinical Psychology Training and Research (OxICPT-R) offer anti-racism training for CPs. The training consists of 1.5 days of facilitator-led training and four peer-led reflective practice groups. The content includes concepts of privilege, White privilege and power imbalance, intergenerational and cultural experiences as well as exploration of racial misconceptions and issues of systemic and structural racism in the United Kingdom context. The intention is to foster meaningful and sustained change regarding thinking, relational behaviour and professional practice. Similarly, other training courses across the UK have implemented anti-racist or diversity training. Yet still, the evidence base for the perceived behavioural impact of such training remains limited. The present study focuses on CTs perceptions of how the training influences awareness and practice within clinical psychology training, rather than directly measuring behavioural change.

Limitations in the Evidence Base

Although there is growing recognition for the need of anti-racism training, there remains a gap in the literature reviewing the efficacy and outcomes. In their meta-analysis, Paluck et al. (2021) examined outcomes of "diversity training" and found inconsistent effects on attitudes, and limited evidence of sustained behavioural change. They reported that many interventions relied heavily on awareness-raising without addressing structural or behavioural mechanisms. This was reflected in the fact that many of the studies focussed on psychological mechanisms of change, based on social psychology theories such as Intergroup Contact Theory (Allport, 1954) i.e. use of "diverse trainers" (Paluck et al., 2021). Others such as Chaney (2016) focussed on cognitive theories to encourage change by providing attendees

with personal feedback about their specific biases (Paluck et al., 2021). This may explain the short-term shifts in self-reported bias and limited long-term practical change. The heterogeneity of interventions means that "diversity training" often encompasses a wide range of interventions from basic equality workshops to intensive anti-racism programmes, therefore direct comparison is difficult.

A more recent review similarly concluded that while diversity training can enhance knowledge, it rarely influences behaviour change unless embedded within broader organisational change, accompanied by follow-up structures, and focused explicitly on skills development (Devine & Ash, 2022). Very few studies explore anti-racism training specifically, and even fewer examine outcomes within the Clinical Psychology training context. The relational and evaluative structures exclusive to the field mean that findings relating to other workplaces cannot be easily generalised to Clinical Psychology. Specifically, little empirical attention has been directed towards understanding what facilitates or hinders CTs in translating anti-racism training into meaningful changes in their practice. Without systematic evaluation, it remains unclear whether existing training is perceived to address the behavioural aspects of racism and bias or if it merely raises awareness without translating into perceived changes in practice.

Behavioural Framework

The anti-racism training delivered at OxICPT-R was developed as part of a programme-level initiative to support CPs to reflect on issues of race, privilege and power within training and evaluative relationships with trainees. The training was informed by Kolb's Experiential Learning Theory (Kolb, 1984), which conceptualises learning as a cyclical process involving concrete experience, reflective observation, abstract conceptualisation, and active experimentation (Kolb, 1984). Within this model, participants engage with new experiences, reflect on their meaning, develop new conceptual

understandings and apply these insights within practice (Kolb, 1984). The training therefore aimed to encourage learning through reflective discussion, shared dialogue and experiential activities that encouraged participants to reflect on their assumptions and translate these reflections into practice. However, given that increased awareness alone does not necessarily translate into sustained behavioural change (Devine & Ash, 2022), the present study employed a behavioural framework to explore factors that may influence whether learning from the training is perceived to be implemented.

Given the gaps in the existing literature, and the challenges involved in translating anti-racism principles into sustained training and professional practice, evaluating the perceived impact of the OxICPT-R anti-racism training requires a suitable framework to capture behaviour change. Importantly, the model must account for the complexity of professional behaviour within training relationships including the emotional, cognitive and relational processes that influence how CPs involved in training engage with race and the institutional structures that frame it. It should also demonstrate the difference between awareness and action, highlighting why knowledge and positive intent alone does not equate to or translate into meaningful, actionable change. Crucially, barriers that prevent application of change should be identified. The Capability Opportunity Motivation-Behaviour (COM-B) model (Michie et al., 2011) is a comprehensive, behaviourally focused model encompassing these key aspects of change.

The model (Figure 1) conceptualises behaviour as the result of the interaction between capability, opportunity and motivation, offering multiple explanatory avenues for behavioural change (McDonagh et al., 2018). It uniquely considers these interacting dimensions to outline how change extends beyond awareness or attitudinal shifts. The inclusion of systemic and social dimensions (opportunity), alongside personal knowledge and skills (capability), and reflective and unconscious beliefs (motivation), makes it particularly well-suited to exploring

complex issues such as racism, systemic bias, and reflective practices within clinical training settings. Notably, the model has been used in the evaluation of behaviour change at both individual and organisational levels (Alexander et al., 2014; Barker et al., 2016; Rubinstein et al., 2015). Therefore, suggesting utility in its application to the present investigation to identify helpful and hindering influences on perceived behavioural practices and potentially improve the current training provided.

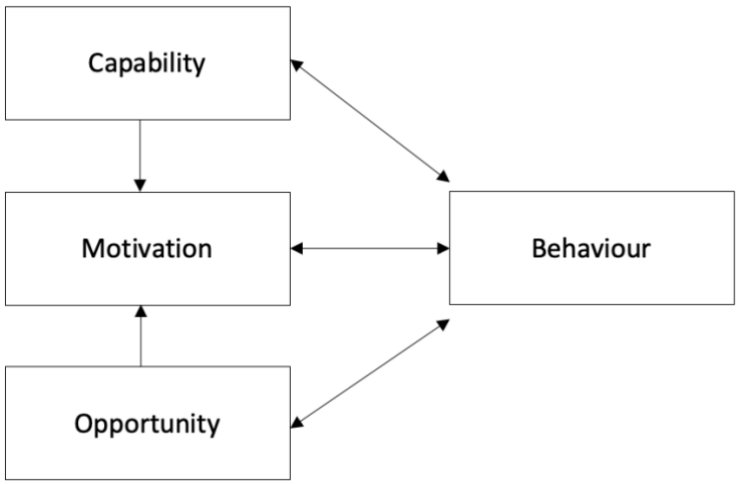


Figure 1. Re-creation of the COM-B model (Michie et al., 2011)

Course Tutors

Although the anti-racism training at OxICPT-R is delivered to both CTs and external NHS CPs, the present study focuses specifically on CTs within the Oxford DClinPsy programme, and it is therefore important to highlight the contextual difference. CTs are in a distinct influential position of power pertaining to assessment, decision-making, teaching, recruitment and pastoral support, ultimately shaping many aspects of the training journey. Therefore, their ability to engage with anti-racist practice has wide-reaching implications for TCPs on an individual level as well as the institutional structure. Evaluating the experience of course staff independently provides the opportunity to understand how the anti-racism training interacts with the academic context and offers a targeted basis for possible improvements.

Project Aims

1. Identify barriers and facilitators to implementing learning from anti-racism training
2. Map these onto the COM-B model
3. Suggest ways to improve training to have a greater impact on perceived behaviour change.

Method

Design

A qualitative research design was employed using a semi-structured interview schedule (Appendix E) allowing for in-depth exploration of CTs' experience. Interview questions were designed in collaboration with an Expert by Experience, ensuring meaningfulness from the service-user perspective.

Participants

Participants were CTs at OxICPT-R who had undertaken the anti-racist training at least 3 months prior, to allow adequate time for perceived behaviour change. An email invitation was sent to all sixteen CTs who were eligible to take part detailing the study information (Appendix F). CTs who consented (Appendix G) to participate were invited to interview. Participants were asked to provide demographic information including age, gender, and ethnicity, to contextualise findings. In total, nine participants took part, one participant withdrew their data after the interview and their data was subsequently deleted and therefore was not included in the analysis.

Data Collection

Each semi-structured interview lasted approximately one hour and took place online via Microsoft Teams or face-to-face, dependent upon CT preference. All interviews were audio recorded and securely stored. Audio files were deleted once they had been transcribed and anonymised.

Data Analysis

Interview transcripts were analysed using Reflexive Thematic Analysis (RTA) (Braun et al., 2019; Braun & Clarke 2019). The analysis was conducted inductively, with themes developed directly from the data rather than being driven by a pre-existing theoretical framework. The process involved familiarisation with transcripts before coding and identification and refinement of themes through iterative engagement with the dataset. Anonymised quotes were used to illustrate and substantiate themes. Following completion of the inductive thematic analysis, the COM-B model (Michie et al., 2011) was used as an interpretive framework to support understanding of how the identified themes related to potential influences on behaviour change. To mitigate potential biases, themes were discussed and refined with the research supervisor.

Consistent with the principles of RTA, the researcher kept a reflexive journal to document reflections, assumptions and positionality (summarised in Appendix H) throughout the data analysis process (Braun & Clarke, 2019). The researcher took a critical realist epistemological stance (Bhaskar, 2008; Gorski, 2013), acknowledging that participants' accounts reflect real experiences within the structures of the Oxford training course, whilst recognising that interpretation of these accounts is shaped by the researcher's perspective.

Governance Approval

This project was registered as an audit and service improvement project through the AMaT system and approved by the Oxford Health Foundation Trust (OHFT) Clinical Audit Team. Confidentiality and anonymity were adhered to throughout. Informed consent was obtained from all participants, and they were informed of their right to withdraw without consequence.

Results

Sample Characteristics

The average age of participants (n = 8) was 40.88 years old (*SD* = 7.88) with the majority identifying as female (n = 6; 75%) and White British (n = 6; 75%). Of note, demographic information was limited to keep the process anonymised for participants when the project was fed back to the service.

Thematic Analysis

Thematic analysis of eight qualitative interviews generated five overarching themes: (1) Emotional Discomfort as a Catalyst for Anti-Racist Learning; (2) Developing Motivation for Anti-Racist Practice; (3) Barriers to Translating Awareness into Action; (4) Negotiating Power and Privilege in Clinical Psychology Training; and (5) Training Structures as Enablers or Constraints on Anti-Racism Practice, with a number of subthemes also generated (see Figure 2 for thematic map). Within the theme of 'Developing Motivation for Anti-Racist Practice' the following sub-themes were generated: (1) Heightened Reflective Awareness; (2) Translating Change into Professional Practice; (3) Re-evaluating Professional Identity and Ethical Responsibility; (4) Peer Dialogue Supporting Critical Reflection. Within the 'Barriers to Translating Awareness into Action' theme, the following sub-themes were generated: (1) Institutional Pressures and Performative Allyship; (2) Personal Uncertainty and Fear of "Getting it Wrong". Within the 'Negotiating Power and Privilege in Clinical Psychology Training' theme, two sub-themes were generated: (1) Structural Inequalities within the Profession; (2) Navigating Hierarches between Trainees and Staff.

The themes represented interpretive patterns of shared meaning across the dataset, reflecting how participants made sense of the anti-racism training and its perceived implications for clinical psychology training and practice.

Throughout the Results, participant quotes are identified using anonymised identifiers (P1-P8).

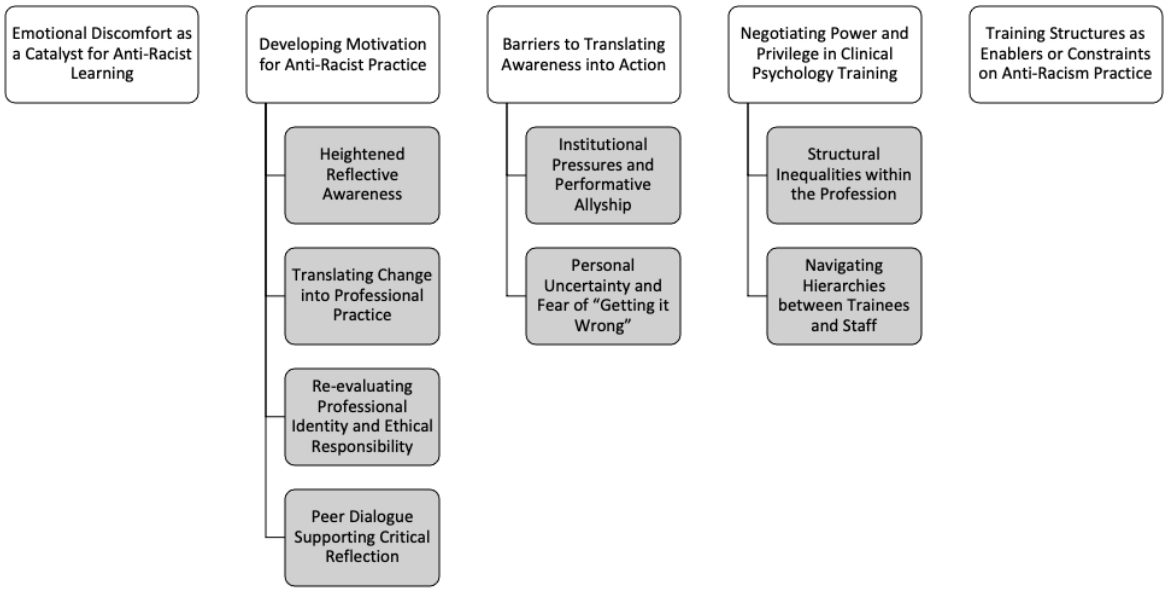


Figure 2. Thematic map illustrating the relationships between themes and subthemes

Emotional Discomfort as a Catalyst for Anti-Racist Learning

Participants consistently reflected on the emotional weight of engaging in anti-racism training with feelings of vulnerability, discomfort, and self-consciousness commonly expressed. One participant reflected: *"There was a lot of emotion in the room... people were in tears at points talking"* (P3). The training invited CPs to engage with ideas of individual privilege and implicit biases with some describing this leading to a sense of exposure: *"It was a challenge to some of these stereotypes that people might have… you don't have any disadvantages as well that might not be visible"* (P5). This discomfort was not always unwelcome, with several participants recognising its importance in the learning process: *"It was a bit challenging at times, but probably in the right way"* (P7). *"It was one of the most moving pieces of teaching I've ever attended"* (P5). Together, these accounts suggest that

emotional discomfort functioned as a catalyst for critical reflection, prompting participants to engage more deeply with issues of race and privilege within their professional roles.

Developing Motivation for Anti-Racist Practice

Heightened Reflective Awareness. The training promoted critical reflection with participants noting how their awareness of race, identity, and privilege was heightened both professionally and personally: "*A veil has dropped and suddenly it feels a little bit like the Matrix… this awful prejudicial code in front of me*" (P5). "*I thought about it loads afterwards and I still think about it. I just keep thinking about it*" (P8). Some reflected on their past professional conduct and interpersonal assumptions: "*I was thinking about how I've maybe shut things down or avoided them in the past*" (P7).

Translating Change into Professional Practice. Several participants described tangible changes to their practice, including changes in clinical and research supervision, and admissions: "*It has influenced how I think about admissions and my role in the admissions process… it's on my radar in a different way*" (P5). "*I've found myself noticing things and calling them out more*" (P4). Others reported using insights from the training to initiate team conversations: "*We are having more discussions about what structural racism might look like in the NHS*" (P1).

Re-evaluating Professional Identity and Ethical Responsibility. Participants described an evolving understanding of their own positionality and the ways in which their backgrounds, identities, and professional roles shape their interactions with others with some reflecting on becoming more conscious of what they bring into professional spaces: "*I'm much more aware now of what I bring into a room with me*" (P2). "*It made me reflect on my own upbringing and how it's shaped my views*" (P1). Acknowledging privilege was described as an emotional and complex process: "*It's hard to sit with the knowledge that I've benefited from a system that disadvantages others*" (P7).

Some participants reflected on shifts in identity and ethical positioning: "*It made me think about how I carry myself in the world and what I represent to others*" (P1). "*It's made me think about myself as a person, not just as a professional*" (P6). This internal work was described as ongoing: "*It feels like work that continues beyond the training… it's a mindset*" (P5). Many participants noted re-evaluating their ethical responsibilities as CPs: "*It made me realise that being anti-racist isn't a nice-to-have, it's an ethical responsibility*" (P3). "*This is part of being a competent clinician*" (P6).

Peer Dialogue Supporting Critical Reflection. Many described how the peer reflective groups created opportunities for open dialogue and collective reflection, which helped promote engagement with anti-racist practice. Participants reported these spaces to be supportive, facilitating honest and open discussion about race, privilege and professional identity: "*There was a lot of respect in the room… and it made it easier to be honest*" (P2). "*We asked difficult questions of each other and took it seriously*" (P5). The reflective spaces were particularly valued for encouraging dialogue between trainees and staff: "*It helped create a bit more of a level playing field between staff and trainees*" (P3), suggesting that these discussions helped normalise conversations about race within professional contexts and encouraged continued motivation beyond the training itself.

Barriers to Translating Awareness into Action

Institutional Pressures and Performative Allyship. Concerns were raised about the sincerity of institutional efforts: "*I sometimes worry it's seen as ticking a box… like, OK, we've done that training now…There's a danger that people say the right things but don't follow through*" (P8). Participants expressed concern about performative allyship: "*I worry sometimes about how much of this is virtue signalling*" (P5).

Personal Uncertainty and Fear of "Getting it Wrong". Personal limitations such as lack of knowledge or fear of **"**getting it wrong**"** were discussed: "*You're constantly scared of*

saying the wrong thing" (P6). "*Sometimes I feel out of my depth, like I don't know enough to speak up*" (P4). Several participants described internal conflict about their role in addressing racism: "*As a white person, I feel like I should be doing more, but I also don't want to centre myself*" (P8).

Negotiating Power and Privilege in Clinical Psychology Training

Structural Inequalities within the Profession. Participants acknowledged how institutional structures in clinical psychology reflect broader systems of inequality: "*The system is set up to replicate itself. It doesn't really make space for different types of people"* (P1). There was concern about how structural barriers affect recruitment and retention: "*We need to ask why some people don't apply, or don't stay, and what that says about the profession*" (P6).

Navigating Hierarchies between Trainees and Staff. Discussions often returned to the dynamics of power between staff and trainees: "*It's hard to challenge things when you're a trainee. There's a fear of repercussions*" (P7). The training helped foster more collaborative dialogue: "*It opened up space for more honest conversations across hierarchy* (P8)*".*

Training Structures as Enablers or Constraints on Anti-Racism Practice

Participants were overwhelmingly positive about the delivery and facilitation of the training: "*[The facilitator] was an excellent facilitator, engaging, open, and clear*" (P2). The facilitator's style including storytelling approach and use of reflective spaces were particularly valued: *"Hearing his story made the concepts feel real. It wasn't just theoretical" (P5)*. However, some suggested improvements: *"The second session felt more generic… it could have been more tailored"* (P3). *"It would be good to have more follow-up sessions to keep the momentum going"* (P1). Others highlighted the need for ongoing embedding: *"It can't just be one-off training. It has to be part of everything we do"* (P4).

Discussion

Summary of Results

Overall, the training elicited feelings of discomfort, guilt, vulnerability and empathy. Consistent with literature indicating that productive discomfort is essential for learning in this area (DiAngelo, 2018; Matias, 2016), participants largely understood that these emotions were necessary for growth. The training encouraged introspection, shifts in identity and ethics, and, for some, observable changes in CT-TCP discussions, admissions decision-making, research supervision and interpersonal interactions. Participants reported noticing racial dynamics more readily and initiating or joining conversations in a way that they may not have done so previously.

Yet still, barriers to behavioural change remained at both individual and structural levels with participants describing fear of *"getting it wrong"*, uncertainty about language, worries about tokenism and being seen as performative. These worries were in line with the literature denoting White professionals often struggle with shame, fragility or avoidance when engaging with racism (Denyer et al., 2022). At the structural level, barriers included resistance embedded within organisational structures, lack of explicit accountability and concerns that anti-racism could be treated as a *"tick-box exercise"*. Collectively these findings illustrate that though motivation may be present, psychological capabilities and opportunities to enact learning, requires support.

Participants also shared reflections about the longstanding structural patterns and entrenched ways of working that uphold inequalities, questioning how power operates through selection, assessment and course systems. Many reflected that one-off training cannot meaningfully shift an embedded culture of inequality unless accompanied by sustained institutional commitment. The facilitators narrative approach and the peer-reflective

groups were highlighted as strengths of the training though participants expressed a desire for more follow-up sessions and explicit practical application.

This project explored CPs experiences of an anti-racism training programme delivered within OxICPT-R, with the aim of identifying behavioural facilitators and barriers influencing whether CTs implemented anti-racist practice. Five overarching themes and several related subthemes were identified. The analysis illustrated that while the training was impactful at an emotional and reflective level, translating this into sustained behavioural change is shaped by a complex interaction of personal, relational and institutional factors.

Applying the COM-B Model to Anti-Racist Behaviour Change

The COM-B model conceptualises behaviour change as an outcome following the interaction between Capability, Opportunity, and Motivation (Michie et al., 2011). The model usefully presents a framework to understand why insight alone does not always translate to behavioural outcomes, and how future training can be adapted to enhance the likelihood of meaningful change.

Capability (Psychological and Physical)

Notably, psychological capability increased substantially following the training with participants reflecting on a developed awareness of privilege, racialised dynamics and their own positioning. Additionally, many identified an increased ability to recognise microaggressions, bias or procedural inequalities. However, physical capability i.e., skills for naming racism, intervening, managing defensiveness or facilitating conversations, was less developed with participants requesting practical tools examples of structured exercises. Unsurprisingly, the gap is in line with literature suggesting that increasing awareness alone is insufficient without skills training (Devine & Ash, 2022)

Opportunity (Social and Physical)

Though the reflective practice groups offered an important social opportunity as a safe space for discussion, opportunities to enact practice within systems, such as in supervision, admissions meetings, and governance processes, were inconsistent. Participants expressed uncertainty about institutional expectations and lack of follow-up and physical opportunities for example, time, resources, and organisational reinforcement, were often constrained. Though CPs have more reflective space and arguably, responsibility, than many other NHS staff, competing demands and limited prompts within academia limit opportunities to embed anti-racist practices.

Motivation (Reflective and Automatic)

Motivation was the strongest facilitator identified by participants. Reflective motivation was heightened through ethical framing with participants conceptualising anti-racism as a core professional responsibility. Automatic motivation, shaped by emotional processes was mixed; for some, discomfort encouraged learning but for others, it inhibited action due to fears of saying the wrong thing, shame or self-consciousness. This was in accordance with literature suggesting emotional defensiveness constrains racial dialogue and inhibits behavioural change (Spanierman & Smith, 2017).

Table 1 maps the themes onto the COM-B model and illustrates how facilitators and barriers interact to shape CTs' ability to behaviourally engage with anti-racist practice.

Table 1. Findings mapped onto COM-B model to inform recommendations

COM-B Domain	Definition	Study Findings (Barriers & Facilitators)	Implications for Anti-Racist Practice
Psychological Capability	Knowledge, psychological understanding, reflective skills	**Facilitators:** Increased awareness of privilege, bias, and racialised dynamics; Heightened reflective capacity and insight into positionality. **Barriers:** Uncertainty about how to intervene in real situations; Limited understanding of how to respond to microaggressions or supervise racialised distress.	Training should include explicit skills-development, case examples, and applied practice. CTs need structured guidance to translate insight into action.
Physical Capability	Practical skills and communication abilities necessary for behaviour	**Facilitators:** Some confidence gains in naming concerns and raising race in discussion. **Barriers:** Fear of saying the wrong thing; Lack of scripts, language, or specific techniques; Emotional demands sometimes overwhelm ability to act in-the-moment.	Offer role-plays, scripts, conversation prompts, and experiential practice. Build confident communication strategies for addressing race-related issues.
Social Opportunity	Social influences, norms, interpersonal processes, cultural expectations	**Facilitators:** Peer reflective groups created psychologically safe spaces; Training reduced hierarchical barriers between staff and trainees. **Barriers:** Team cultures where race is rarely discussed; Perceived norms of politeness or conflict-avoidance; Concerns about virtue signalling or being judged.	Embed ongoing reflective spaces, normalise race-related conversation, and reinforce anti-racism as a shared professional expectation rather than an optional topic.
Physical Opportunity	Environmental resources, time, organisational structures	**Facilitators:** Protected training and reflection time during programme. **Barriers:** Limited time in supervision to explore race; Lack of institutional structures that require or support anti-racist practice; No practical tools integrated into routine course processes (e.g., admissions, supervision templates).	Develop structural prompts (supervision agendas, admissions guidance), allocate time within institutional processes, and integrate anti-racism into governance and quality assurance.
Reflective Motivation	Values, identity, intentions, conscious decision-making	**Facilitators:** Strong ethical alignment: participants viewed anti-racism as a professional responsibility; Increased motivation to reflect, challenge bias, and amend practice. **Barriers:** Questions about institutional authenticity and sustainability of change; Uncertainty about the legitimacy of their own involvement (e.g., "not wanting to centre myself").	Reinforce ethical foundations and provide ongoing CPD to maintain momentum. Clarify institutional commitments to support long-term motivation.
Automatic Motivation	Emotions, impulses, habits, unconscious processes	**Facilitators:** Productive discomfort encouraged movement toward action; Emotional resonance of storytelling and personal narratives strengthened engagement. **Barriers:** Shame, guilt, fear, and paralysis inhibited confident action; Avoidance responses when discomfort felt overwhelming.	Build emotional tolerance through guided exposure to discomfort, supportive peer spaces, and reflective supervision. Normalise emotional reactions as part of anti-racist work.

Comparison with Existing Literature

The findings of the present study align with the existing evidence base that diversity training does well to increase knowledge and short-term attitudinal shifts but does not lead to consistent behavioural change without structural and relational scaffolding (Devine & Ash, 2022; Paluck et al., 2021). The key theme of discomfort is in accordance with literature highlighting that racial learning requires emotional engagement (Matias, 2016). Participants' concerns about being seen as performative or tokenistic reflects Ahmed's (2012) argument that institutional anti-racism can appear symbolic if not accompanied by systemic transformation.

The strong emotional impact reported by participants sits in contrast with the limited behavioural change observed more commonly in diversity training, suggesting that the narrative-driven and relationally oriented facilitation may be particularly effective. Though it is important to note that CPs may be unusually well-placed to engage in reflective and reflexive work due to the reflective capability built into the professional identity and training, an advantage that may limit generalisability to other NHS settings.

Recommendations mapped onto the COM-B Model

The below recommendations are presented as actionable guidance for course leadership and training commissioners.

Enhance Practical Skills Training (Capability)

In line with the requests from participants and to move beyond awareness, the training should incorporate behavioural skills. This may include specific scripts for naming microaggressions or racism, structured supervision prompts, modelling and role-play of challenging scenarios and example conversations with reflective debrief. This would directly target physical capability.

Embed Ongoing Reflective and Follow-Up Spaces (Opportunity)

Participants highlighted that the impact of the training would be sustained via follow-up. Therefore, in line with this and the evidence base indicating the benefits of spaced learning (Devine & Ash, 2022), it is recommended that the course should provide termly follow-up workshops. Additionally, anti-racism may be embedded as a fixed supervision agenda item. It is also recommended that the course introduce brief reflective accounts within annual appraisal review and maintain peer reflective groups as protected brave space.

Strengthen Psychological Safety (Motivation)

As discomfort has the potential to both facilitate and inhibit behaviour, training should cultivate psychological safety. To do this, facilitators should validate discomfort as part of learning, provide strategies for managing emotional defensiveness, create a space for curiosity in lieu of perfection and model compassionate challenge.

Institutional Embedding and Accountability (Opportunity and Motivation)

Without systemic reinforcement, as named by participants, training risks becoming performative or tokenistic. To combat this, it is recommended that anti-racism should be embedded into supervision competency frameworks, admissions processes and decision-making, staff appraisal and CPD structures as well as governance procedures and annual audit cycles.

Develop Tailored Tools and Resources (Capability and Opportunity)

Participants highlighted the need for practical resources, this may include an anti-racism supervision checklist, specific questions for addressing race in clinical formulation, guidance for addressing racial dynamics in supervision and tools to aid decision-making for admissions panels.

Implications for Practice

Importantly, this project highlights the importance of behavioural, ethical and institutional commitment for longstanding and meaningful anti-racist practice. CPs have a formative role in TCPs experience and development, therefore increasing their capacity to engage with anti-racist practice through capabilities, opportunities and motivation is essential. Inclusive of the CT context, embedding an anti-racist culture institutionally, may help dismantle the hierarchy of Whiteness within the profession and support retention of PoGM trainees.

Strengths and Limitations

Importantly, the use of a theoretical framework to provide a structured evaluation of barriers and facilitators allowed the findings to move from descriptive accounts of training experiences to practice-relevant recommendations. The qualitative approach allowed for a rich exploration of views that may not have been captured through quantitative outcome measures alone, enhancing the ecological validity of the findings within the course setting.

However, use of self-report perceptions of impact rather than objective behavioural measures may limit conclusions regarding sustained changes in practice. The absence of pre- and post- assessment restricts the ability to infer direct causality. Additionally, as participation was voluntary, self-selection bias may be prevalent with the sample perhaps already more motivated to engage with anti-racism than those who did not volunteer. Furthermore, the project focussed on short-term reflections.

Future Research

Future research should seek to evaluate whether anti-racism training leads to measurable behavioural change within clinical psychology training contexts. Longitudinal approaches would be most appropriate to capture behavioural practices before and after attending training. One such approach may involve the use of pre- and post-training

behavioural indicators, such as auditing whether race-related discussions are explicitly included within supervision agendas or reflective discussions. It is however, important to acknowledge the confidentiality issues that arise with this suggestion. Alternatively, trainee feedback collected before and after training may provide insight into whether CT practices become more open to discussions of race, discrimination and cultural dynamics, though this approach may be less objective and introduce bias. Longitudinal audits of admissions processes and decision-making practices could also examine whether training influences selection procedures or the consideration of equity and inclusion during recruitment. Such approaches may help determine whether behavioural changes are sustained over time and whether training contributes to broader institutional shifts in anti-racist practice.

Conclusion

Anti-racism training has the potential to produce powerful emotional and reflective shifts, but in isolation, cannot sustain behavioural change. Using the COM-B model highlights the complex interplay between Capability, Opportunity and Motivation in shaping CPs' anti-racist practice. Participants reflections highlight the need for practical skills, ongoing reflective spaces, psychological safety and systemic embedding. With structural commitment, anti-racist practice can move from good intention to meaningful action, strengthening the inclusive culture of the training programme and contributing to a more equitable profession.

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Theoretically Driven Research Project: Wellbeing and Burden in Informal Stroke Carers: A Social Identity Approach

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Proposed Journal: Disability and Rehabilitation: This journal publishes research pertaining to all aspects of disability and rehabilitation including recent publications regarding stroke carers.

Abstract

Background: Carers are central to community stroke rehabilitation yet frequently experience high burden and reduced wellbeing. Social Identity Theory (SIT) proposes that pre-incident group membership and continuity of these identities, may protect psychological adjustment during major life transitions.

Aims: To examine whether pre-stroke multiple group membership predicts carers' wellbeing beyond burden and six-month post-stroke cognitive impairment (PSCI), and whether social identity continuity predicts lower burden beyond PSCI.

Methods: In a cross-sectional dyadic study, 55 stroke survivor–carer dyads were recruited from the Oxford Cognitive Screen -Recovery (OCS-Recovery) database. Carers completed measures of wellbeing, burden, multiple group membership, and identity continuity; survivors' six-month cognition was indexed using OCS performance.

Results: Multiple group membership did not predict wellbeing beyond burden and PSCI. Social identity continuity significantly predicted lower burden independent of PSCI.

Conclusions: Maintaining valued group memberships is associated with reduced perceived burden in chronic stroke caregiving. Identity continuity may offer a clinically meaningful pathway for carer interventions.

Keywords: Informal Carers, Stroke, Social Identity, Identity Continuity, Carer Burden, Carer Wellbeing

Introduction

Stroke and Post-Stroke Cognitive Impairment

Of the 1.3 million stroke survivors in the United Kingdom (National Institute for Health and Care Excellence (NICE), 2023a), two-thirds live with long-term disabilities (Stroke Association, 2022). Whilst physical disability is perhaps the most visible marker of stroke, cognitive sequelae, referred to as "Post-Stroke Cognitive Impairment" (PSCI) have a widespread impact upon functional independence including activities of daily living (Stolwyk et al., 2021) and quality of life (Stolwyk et al., 2024). PSCI affects over 70% of survivors (Rost et al., 2022) and can impact multiple domains including attention, language, memory and executive functioning (Demeyere et al., 2015; Rost et al., 2022). PSCI may require high levels of supervision, decision-making support and behavioural management, complicating the rehabilitation process and increasing care needs (Tatemichi et al., 1994).

The Informal Carer: A Clinical and Systemic Necessity

With the shift towards community-based rehabilitation models (NHS England, 2025), discharge home often relies on "informal" care from family members (Persson et al., 2015; Quinn et al., 2014). Often referred to as "informal carers" (hereafter referred to as "carers") in the literature, carers provide unpaid support to someone with care needs who would otherwise be unable to cope (NHS England, n.d.). This long-term support, typically from spouses or adult children (Pinquart & Sörensen, 2011), is important for rehabilitation outcomes (Evans et al., 1994; Mackenzie & Greenwood, 2012), with survivors who report feeling well-supported by their family also reporting better mental wellbeing (Low et al., 1999; Morris et al., 1991). NICE guidelines outline the assessment of carer needs as an important part of the rehabilitation pathway (NICE, 2023b).

Despite this, caring is often associated with significant psychological cost with the term "carer burden" well-established in the literature (Thornton & Travis, 2003);

encompassing the emotional, physical, financial and social demands of caregiving. Research demonstrates that these domains closely map onto stroke carers' reported lived experiences, including stress and reduced wellbeing (Loh et al., 2017; Pont et al., 2020). Research indicates this is particularly salient within neurological caregiving contexts (Sallim et al., 2015). Within stroke specifically, the psychological impact of caring may be especially pronounced due to the sudden and often catastrophic nature of onset, alongside the potential for complex and enduring sequelae such as cognitive, behavioural, and personality change following cerebral insult (Bucki et al., 2019; Mukherjee et al., 2014). However, these challenges are not unique to stroke and present across other acquired neurological injuries (Zarzycki et al., 2024).

Theoretical Frameworks: From Transactional Stress to Social Identity

Historically, caregiver wellbeing and burden have been conceptualised using the Transactional Model of Stress and Coping (del-Pino-Casado et al., 2011; Hawken et al., 2018; Lazarus & Folkman, 1984) which proposes that carer burden is influenced by how carers appraise the demands of the situation relative to their perceived ability to cope. Within the model, PSCI is positioned as the primary stressor and psychological outcomes are assumed to result from carers' cognitive appraisals of these demands. Whilst the model has been influential in highlighting the role of subjective appraisal, it has notable limitations. Specifically, it conceptualises coping as an individual-level process and gives relatively little consideration to the broader social and relational context in which caregiving occurs. This is especially relevant in stroke caregiving, where changes to roles, relationships, and social participation are often profound and enduring.

Clinically, cognitive functioning in the early post-stroke phase is characterised by substantial variability due to transient physiological factors (Nys et al., 2007). Consequently, early cognitive profiles are poor predictors of longer-term caregiving demands (Levine et al.,

2015). Instead, six-month post-stroke represents a clinically meaningful review point whereby cognitive functioning has typically stabilised, and forms part of routine stroke follow-up in clinical guidelines (NICE, 2023b). Therefore, six-month PSCI provides a useful index of ongoing cognitive-related impairments that may shape caregiving demands, though further recovery may still occur (Kusec et al., 2023; Milosevich et al., 2025).

Together, these limitations highlight the need for theoretical models to explicitly account for the social context of caregiving. Accordingly, the present study adopts Social Identity Theory (SIT), which emphasises the role of group membership and continuity of valued social identities in shaping wellbeing and psychological adjustment across major life transitions (Haslam et al., 2008; Haslam et al., 2009; Haslam & Reicher, 2006; Tajfel & Turner, 1979). From this perspective, PSCI is understood as a contextual factor that may threaten valued roles and identities, shaping the carers' experience of burden and wellbeing.

Social Identity Theory: Group Membership and Social Identity Continuity

SIT proposes that an individual's sense of self is fundamentally shaped by their membership to social groups for example, family, workplaces and community groups (Haslam et al., 2009; Tajfel & Turner, 1979). Research suggests that these group memberships provide access to psychological resources such as meaning, belonging, support, and self-esteem, and form an important psychological resource during periods of stress and change (Haslam et al., 2008; Reicher & Haslam, 2006). Therefore, wellbeing is not only a function of an individual's capacity to cope, but is deeply embedded within social relationships and group-based identities.

Major life transitions may destabilise these social identities by disrupting established roles and patterns of social participation; becoming a carer represents one such identity transition. Transition to a caring role is often accompanied by loss or reduction in access to

important social group memberships (e.g., employment). SIT proposes disruption to social identities leads to poorer psychological outcomes.

Two identity constructs are central in this context: (1) the number of meaningful group memberships that form part of a person's self-concept pre-role transition ("multiple group membership") and (2) the extent to which these group memberships are maintained across the transition ("social identity continuity") (Haslam et al., 2008). To buffer against potential loss or change, multiple group memberships provide diverse sources of identity-based support and increase the likelihood of social identity continuity across major life transitions (Haslam et al., 2008; Iyer et al., 2009). However, the relative importance of breadth versus continuity of group membership remains under-examined in caregiving contexts.

A key benefit of having multiple groups before a stressful life event is the increased likelihood of maintaining at least some of these connections subsequently (Haslam et al., 2008; Jetten et al., 2012). For a new carer, maintaining these connections to their pre-carer identity may protect against poor psychological outcomes by enabling them to integrate the caregiving role into a coherent sense of self rather than experiencing it as an all-encompassing identity (Haslam et al., 2008).

Whilst SIT has been applied to a range of contexts and health conditions, including stroke survivors themselves (Haslam et al., 2008), application to stroke carers remains limited. The present study therefore aims to evaluate key predictions derived from SIT in stroke caregiving, focusing on the role of multiple group membership and social identity continuity in relation to carer wellbeing and perceived burden.

SIT proposes that prior to life-transition, multiple group memberships represent a broad pool of potential social and psychological resources that support psychological wellbeing (Haslam et al., 2008). This includes positive psychological functioning, meaning,

belonging and purpose. Social identity continuity reflects the extent to which individuals are able to maintain valued aspects of their pre-transition identity (Haslam et al., 2008; Iyer et al., 2009). Where continuity is threatened, individuals may experience identity disruption and increased stress (Haslam et al., 2008). Within the context of caregiving, this may be expressed as burden. The present study examines the relationship between multiple group membership to wellbeing, and social identity continuity to burden.

Rationale and Hypotheses

There is a scarcity of empirical research examining how changes to social identity and group membership relate to carer outcomes independently of clinical influences (e.g., PSCI). This gap has important implications for carer intervention.

Existing approaches focus on reducing caregiving demands however, opportunities to reduce demands are often limited (Greenwood et al., 2008; Pearlin et al., 1990). SIT proposes that strengthening social identity resources may offer an alternative pathway to support psychological outcomes. Social identities are theorised to support psychological wellbeing, defined here as positive psychological functioning and perceived quality of life (Diener et al., 1999; Ryff, 1989), and to buffer against burden, defined as the subjective emotional, physical, and social strain associated with caregiving (Zarit et al., 1980).

Accordingly, the present study examined whether identity resources explain variance in carers' psychological wellbeing and burden beyond six-month PSCI.

Hypothesis 1 (H_{a1}). Greater pre-stroke multiple group membership will be positively associated with carers' psychological wellbeing, after controlling for perceived carer burden and six-month PSCI.

Null hypothesis 1 (H_{01}). Pre-stroke multiple group membership will not be associated with carers' psychological wellbeing after controlling for perceived carer burden and six-month PSCI.

Hypothesis 2 (H_{a2}). Greater social identity continuity (maintenance of group memberships following the transition to caregiving) will be negatively associated with perceived carer burden, after controlling for six-month PSCI.

Null hypothesis 2 (H_{02}). Social identity continuity will not be associated with perceived carer burden after controlling for six-month PSCI.

Method

Study Design

The study employed a quantitative cross-sectional design. Primary and secondary data were integrated to form dyadic pairs; primary data regarding social identity, wellbeing, and burden were collected from carers at a single time-point. Data for stroke survivors was accessed retrospectively from the existing Oxford Cognitive Screen-Recovery (OCS-Recovery) dataset.

Setting

Participants were recruited from the research volunteer database (OCS-Recovery) within the Translational Neuropsychology Group at the University of Oxford. The database consisted of individuals who had previously consented to be contacted for future research following their participation in the OCS-Recovery study (NHS REC reference: 18/SC/05501).

Participants and Eligibility

Participants were recruited as dyads, comprising a stroke survivor and their carer. Survivors were eligible if they were aged at least 18 years old, had experienced a stroke at least six months prior, had previously consented to be contacted for further research, and had completed the 6-month follow-up assessment in the OCS-Recovery study. Carers were eligible if they identified as a carer for the stroke survivor, had been in the role for at least six

months, were aged at least 18 years and were proficient in English language such that they could complete self-report measures.

Stroke survivors were recruited from the OCS-Recovery database, had previously given informed consent to be contacted for future research and were deemed to have capacity to do so. During recruitment for the present study, capacity to consent was presumed in accordance with the Mental Capacity Act (2005), unless there was a reason to question an individual's ability to understand, retain and communicate a decision regarding participation. Where an individual appeared unable to understand the study information or communicate a decision about participation, they would not have been enrolled in the present study.

Recruitment

Stroke survivors were first contacted to obtain informed consent, approach their carer, and to link their previously obtained data with data collected from their carer. After consenting, their carer was contacted, provided with an explanation of the study and invited to provide their own informed consent. Study information (Appendix J), consent form (Appendix K) and a carers resource pack (Appendix L) were shared with survivors and carers prior to consenting.

Variables and Measures

Outcome Variables

Carer Wellbeing was measured using the Psychological General Wellbeing Index (PGWBI; Appendix M) (Dupuy, 1984). The PGWBI is a 22-item scale assessing psychological health across six domains: anxiety, depression, positive wellbeing, self-control, general health and vitality. Scores are summed, with higher scores indicating greater wellbeing. The measure is widely used in the stroke literature (e.g. Forsberg-Wärleby & Blomstrand, 2004) and has demonstrated high internal consistency and reliability (α=0.94; Gaston & Vogl, 2005).

Carer Burden was measured using the Modified Caregiver Strain Index (MCSI; Appendix N) (Thornton & Travis, 2003). The tool is commonly used within the stroke carer literature (e.g., Blake et al., 2003; Matolia et al., 2022). Participants rate 13-items on a 3-point scale with higher scores indicating greater burden (Freytes et al., 2021). The measure has robust internal consistency (α=.90) and a test-retest reliability coefficient of .88 within carer groups (Thornton & Travis, 2003).

Predictor Variables

Pre-Existing Multiple Group Membership was measured using the 'Multiple Group Memberships' subscale of the Exeter Identity Transitions Scales (EXITS; Appendix O) (Haslam et al., 2008). The scale was adapted for use with carers, changing language to "the stroke". Items are rated on a seven-point Likert scale with greater scores (range =7-49) indicating greater number of meaningful group memberships. The subscale has demonstrated good reliability (α=.78; Iyer et al., 2009).

Social Identity Continuity was measured using the 'Maintenance of Group Membership' subscale of the EXITS, quantifying participants' perception of group membership stability across the transition to caregiving. The scale was adapted for use with carers, with items rated on a seven-point Likert scale and higher scores indicating greater perceived continuity. The subscale has evidenced robust reliability (α=.93-94; Haslam et al., 2008; Seymour-Smith et al., 2017).

The EXITS also includes a 'New Group Membership' subscale, this was not included as it was beyond the remit of the specific focus on pre-existing identity resources and identity continuity across the caregiving transition, in line with a priori hypotheses.

Covariates

Post-Stroke Cognitive Impairment (PSCI) was measured using the Oxford Cognitive Screen (OCS), though this data was not explicitly collected for the present study.

Domains of attention, language, number processing, praxis, memory and executive functioning are assessed across 12 subtests. The tool is reliable and well validated in the stroke population (Demeyere et al., 2015). For the analyses, PSCI was operationalised as the proportion of OCS subtasks failed, with higher scores indicating greater cognitive impairment.

Demographic Variables

Demographic information included carer and survivor age, sex, ethnicity, education, relationship to the survivor, cohabitation status, employment status, hours spent caring, and time since stroke. These variables were used to describe the sample and were explored in bivariate analyses to contextualise caregiving outcomes but were not included as covariates in the regression models.

Sample Size and Power

The study included stroke survivors and their carers. An a priori power analysis was conducted using G*Power 3.1 (Faul et al., 2009) to determine the minimum sample size required for a linear multiple regression (single regression coefficient). The analysis was powered to detect a standard medium effect size (f^2=0.15) for the unique contribution of the social identity predictors. This effect size is in accordance with conventions for behavioural sciences (Cohen, 2009) and is consistent with previous literature indicating that social variables account for a moderate proportion of unique variance in health outcomes (Haslam et al., 2008). To detect a unique effect of this magnitude (f^2=0.15) with an alpha of .05 and a power of .80, a minimum sample size of *N*=55 was required.

Procedure

Ethical approval was granted by University of Oxford Central University Research Ethics Committee (Reference R93569/RE001; Appendix P). Upon providing informed consent, carers were invited to complete the questionnaires. Depending on individual

preference, this was done via telephone, Microsoft Teams, or their home. Following data collection, carer responses were matched with the corresponding stroke survivor's clinical data from the OCS-Recovery database using anonymised participant identification codes to ensure confidentiality.

Statistical Methods

Statistical analyses were conducted using Jamovi (Version 2.6, The Jamovi Project, 2025). Descriptive statistics were calculated for all variables, and Pearson's correlations were used to explore bivariate associations. The dependent variables were carers' psychological wellbeing for Hypothesis 1, and carer burden for Hypothesis 2. Assumptions of linear regression, including normality of residuals and multicollinearity, were examined and met.

Hypothesis testing was conducted using hierarchical multiple regression. For Hypothesis 1, psychological wellbeing was entered as the dependent variable, with six-month PSCI entered at Step 1, carer burden at Step 2, and pre-stroke multiple group membership at Step 3. For Hypothesis 2, burden was entered as the dependent variable, with PSCI entered at Step 1, followed by social identity continuity at Step 2. Changes in explained variance were examined to assess the unique contribution of social identity variables beyond clinical factors.

An exploratory hierarchical regression was also conducted to examine whether social identity continuity was associated with carers' psychological wellbeing after controlling for PSCI and carer burden.

Results

Sample Characteristics

The sample consisted of 55 carer-survivor dyads. Carers had a mean age of 67.9 years (*SD*=14.2) and were predominantly female (67.3%). The majority of carers were spouses (76.4%) or adult children (16.4%) of the stroke survivor, with the remaining being parents,

children or grandchildren (7.2%). Carers reported providing an average of 26.1 hours of care per week (*SD*=34.4), with the majority of carers cohabiting with the stroke survivor (81.8%).

Stroke survivors had a mean age of 74.9 years (*SD*=10.4). The average time since stroke was 6.3 years (*SD*=3.4), indicating a chronic stroke population. The majority of survivors had sustained an ischaemic stroke (74.5%), with lesions affecting the right hemisphere (49.1%) and left hemisphere (41.8%) in similar proportions. See Table 1 for tabulated demographics.

Table 1. Demographic and Clinical Characteristics (N=55 Dyads).

Characteristic	**Carers (*n*=55)**	**Survivors (*n*=55)**
Age (Years)		
M (*SD*)	67.9 (14.2)	74.9 (10.4)
Range (Min–Max)	20 – 91	26 – 90
Sex, *n* (%)		
Female	37 (67.3%)	23 (41.8%)
Male	18 (32.7%)	32 (58.2%)
Ethnicity, *n* (%)		
White British	51 (92.7%)	53 (96.4%)
White Other	3 (5.5%)	1 (1.8%)
Asian/Asian British	1 (1.8%)	1 (1.8%)
Education (Years)		
M (*SD*)	13.0 (2.9)	14.2 (3.7)
Relationship to Survivor, *n* (%)		
Spouse/Partner	42 (76.4%)	—
Adult Child	9 (16.4%)	—
Other (Parent, Sibling, Grandchild)	4 (7.2%)	—
Co-habitation, *n* (%)		
Lives with survivor	45 (81.8%)	—
Hours Spent Together (Weekly), *M* (*SD*)	113.1 (62.6)	
Hours Spent Caring (Weekly)[a], *M* (*SD*)	26.1 (34.4)	
Employment Status, *n* (%)		
Employed	25 (45.5%)	—
Not Employed/Retired	30 (54.5%)	—
Carer Past Mental Health, *n* (%)		
History of Mental Health Difficulties	8 (14.5%)	—
Clinical Characteristics	**—**	**Survivors**
Time Since Stroke (years), *M* (*SD*)	—	6.3 (3.4)
Type of Stroke, *n* (%)		
Ischaemic	—	41 (74.5%)
Haemorrhagic	—	11 (20.0%)
Other/Multiple	—	3 (5.5%)
Lesion Hemisphere, *n* (%)		
Right	—	27 (49.1%)
Left	—	23 (41.8%)
Bilateral	—	3 (5.5%)
Undetermined	—	2 (3.6%)

Note. M = Mean; *SD* = Standard Deviation. [a] Data available for *n* = 54.

Bivariate Correlations

Pearson's correlations were computed to examine the associations between study variables (see Table 2). Contextual demographics (time since stroke, and hours spent caring) were included to assess whether caregiving intensity or stroke chronicity were associated with the primary outcomes.

Carer burden was strongly correlated with wellbeing ($r = -.78$, $p < .001$) and positively correlated with PSCI ($r = .30$, $p = .026$). Hours spent caring was also significantly associated with poorer wellbeing ($r = -0.31$, $p = .021$) and higher burden ($r = .28$, $p = .037$).

Social identity continuity showed a significant negative correlation with carer burden ($r = -.49$, $p < .001$). Multiple group membership was not significantly correlated with wellbeing ($r = .18$, $p = .189$).

Table 2. Correlation Matrix of Key Study Variables (N = 55)

Variable	1.	2.	3.	4.	5.	6.	7.
1. Wellbeing (PWBI)	-						
2. Burden (MCSI)	-.78***	-					
3. Multiple Group Membership (EXITS)	.18	-.09	-				
4. Social Identity Continuity (EXITS)	.50***	-.49***	.24	-			
5. PSCI (OCS Proportion Impaired)	-.12	.30*	-.17	-.14	-		
6. Time Since Stroke	.13	-.28*	.03	.16	.02	-	
7. Hours Caring	-.31*	.28*	-.20	-.43**	.27	-.14	-

Note. *$p < .05$, **$p < .01$, ***$p < .001$.

Hypothesis 1: Multiple Group Membership and Wellbeing

A three-step hierarchical multiple regression was conducted to determine the unique contribution of pre-caregiving multiple group membership to carer wellbeing (N=54). Assumptions of normality, assessed using the Shapiro-Wilk test (p=.789) and multicollinearity (VIF<1.12) were met.

In step one, PSCI did not significantly predict carer wellbeing ($R^2 = .01$, $p = .397$). In step two, the addition of carer burden resulted in a significant increase in variance explained,

ΔR^2 =.60, F(1,51) =80.01, p < .001. Carer burden was a strong negative predictor of wellbeing (β = -0.81, p < .001).

In step three, the addition of multiple group membership explained an additional 2.1% of the variance in wellbeing, but this change did not reach statistical significance, ΔR^2 =.02, F(1,50) =2.91, p=.094. Hypothesis 1 was therefore not supported.

The primary analysis was conducted on complete cases (N=54), excluding one participant with missing clinical data. To assess the robustness of the findings, a sensitivity analysis was conducted on the full sample (N=55) by removing the PSCI covariate from the model. In this analysis, the association between multiple group membership and wellbeing remained non-significant (β=0.10, p=.188). This confirms that the initial finding was robust, not due to the exclusion of missing data.

Table 3. Hierarchical Regression Analysis Predicting Carer Wellbeing (N = 54)

Predictor	**ΔR^2**	***B***	***SEB***	***β***	***p***
Step 1	**.01**				**.397**
Constant		78.20	3.20		< .001
PSCI		-14.40	16.91	-.12	.397
Step 2	**.60*** **				**< .001**
Constant		94.04	2.68		< .001
PSCI		15.75	11.17	.13	.165
Carer Burden		-1.85	0.21	-.81	< .001
Step 3	**.02**				**.094**
Constant		86.99	4.90		< .001
PSCI		18.44	11.08	.15	.102
Carer Burden		-1.83	0.20	-.80	< .001
Multiple Group Membership		1.37	0.80	.15	.094

Note. B = unstandardised regression coefficient; SEB = standardised error of the coefficient; β = standardised coefficient. ***p < .001.

Hypothesis 2: Social Identity Continuity and Carer Burden

A two-step hierarchical multiple regression was conducted to examine whether social identity continuity predicts perceived carer burden, independent of PSCI (N=54). Assumptions of normality, assessed using the Shapiro-Wilk test (p=.126) and multicollinearity (VIF=1.02) were met.

In step one, PSCI was entered as a control variable and accounted for 9.1% of the variance in carer burden and was a significant predictor (R^2=.09, p=.026). In step two, social identity continuity was entered. This resulted in a significant increase in variance ΔR^2=.20, $F_{change}(1,51)$=13.9, p< .001. Continuity was a significant negative predictor (β= -0.45, p < .001), indicating that carers who maintained a stronger sense of identity continuity reported significantly lower levels of burden. Hypothesis 2 was therefore supported by the data.

A sensitivity analysis was conducted on the full sample (N=55) by excluding the PSCI covariate. The association between social identity continuity and burden remained highly significant (β= -0.49, p< .001), confirming robustness of the primary result.

Table 4. Hierarchical Regression Analysis Predicting Perceived Carer Burden (N = 54)

Predictor	**ΔR^2**	***B***	***SEB***	***β***	***p***
Step 1	**.09***				**.026**
Constant		8.55	1.35		< .001
PSCI		16.30	7.14	.30	.026
Step 2	**.20*****				**< .001**
Constant		18.51	2.93		< .001
PSCI		12.98	6.45		.049
Social Identity Continuity		-1.81	0.48		< .001

Note. B = unstandardised regression coefficient; SEB = standardised error of the coefficient; β = standardised coefficient. *p < .05, ***p < .001.

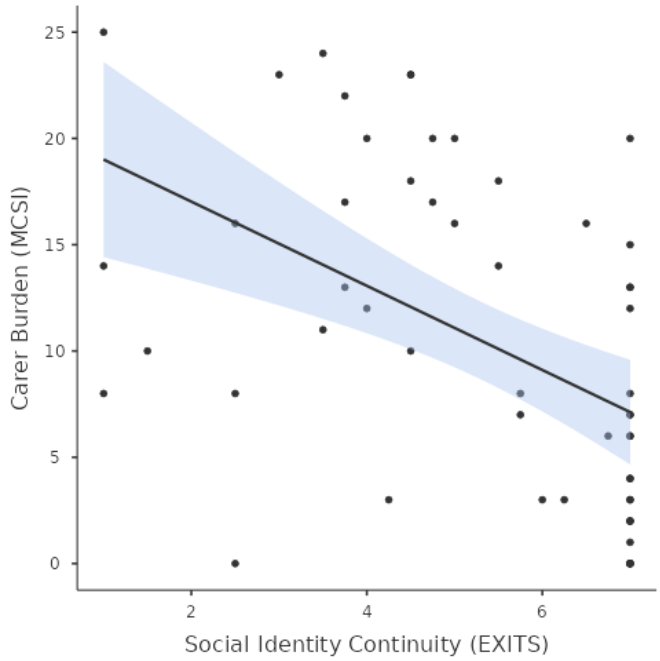


Figure 1. Scatterplot showing the significant negative relationship between social identity continuity and carer burden.

Exploratory Analyses: Social Identity and Wellbeing

After controlling for PSCI and burden, social identity continuity explained an additional 1.9% of the variance in wellbeing, this contribution was not statistically significant (ΔR^2=.02, p=.109).

Discussion

Drawing on SIT, the present study assessed the role of pre-caregiving multiple group memberships on stroke carers' wellbeing, and of social identity continuity on carer burden whilst controlling for 6-month PSCI.

Summary of Findings and Comparison to Existing Literature

Social identity continuity was a significant negative predictor of perceived carer burden**,** independent of six-month PSCI. Carers who reported greater preservation of their pre-stroke group memberships experienced significantly lower levels of caregiving burden. This is consistent with SIT, suggesting continued alignment with valued group-identities supports psychological resilience during major life transitions (Haslam et al., 2005; Haslam & Reicher 2006; Jones et al., 2012). Importantly, despite carers supporting survivors on average for over six years, continuity remained strongly associated with reduced burden. Therefore, findings may extend the existing literature which predominantly focusses on early-stage transitions (Haslam et al., 2008; Jetten et al., 2012) by demonstrating that identity continuity remains meaningful several years later. As the effect persisted whilst controlling for PSCI, it may be argued that continuity does not simply reflect reduced care demands. Rather, it may influence appraisal of coping resources and allow carers to maintain a sense of self by continuing to draw meaning and validation from other valued identities.

In contrast, the hypothesis that pre-caregiving multiple group membership would uniquely predict psychological wellbeing was not supported once perceived burden was included in the regression model. Although a small positive association was observed at the

bivariate level, multiple group membership did not explain additional variance in wellbeing beyond caregiving burden. This finding therefore qualifies, rather than supports, assumptions within the literature that multiple group memberships are consistently protective (Haslam et al., 2008; Iyer et al., 2009), and highlights potential limits to the application of the theory. Specifically, within a chronic caregiving context, multiple group membership may be less salient than the ability to maintain continuity in valued roles once caregiving becomes an embedded life role. This interpretation aligns with broader caregiving literature suggesting that the persistence of valued roles may be more important for psychological outcomes than the number of social roles held prior to caregiving (Jetten et al., 2015). However, the role of caregiving chronicity in shaping these identity processes has received limited attention in the literature.

Consistent with the evidence base, greater cognitive impairment was associated with higher burden (Stolwyk et al., 2024). However, PSCI did not significantly predict wellbeing once burden was included in the statistical model, suggesting that its impact on psychological wellbeing may operate through perceived burden, although this pathway was not formally tested in the present study.

More broadly, the correlational data underscore burden as a key determinant of carers' psychological wellbeing. The strong negative association between burden and wellbeing reflects the wider carer literature, illustrating burden as one of the central predictors of emotional distress, depression and reduced quality of life (Bongelli et al., 2024; Pinquart & Sörensen, 2003; Rigby et al., 2009). Identity continuity demonstrated moderate associations with both lower burden and higher wellbeing, though its effect on wellbeing did not remain significant when burden was entered into the regression model. This pattern suggests that continuity may exert its influence primarily by shaping how carers perceive and

experience burden, consistent with both SIT and transactional stress models (Haslam et al., 2008; Lazarus & Folkman, 1984).

Overall, the results extend the application of SIT to the context of long-term stroke caregiving. Whilst previous research has demonstrated the importance of social identity continuity for stroke survivors themselves (Haslam et al., 2008), relatively little work has examined identity processes among carers. The current study therefore contributes to the evidence base by suggesting that identity continuity may also play a protective role for long-term carers, particularly in relation to burden. These findings support the proposition within SIT that maintaining valued identities across major life transitions can provide psychological resources that support psychological outcomes (Haslam et al., 2008). However, the application of SIT to caregiving remains relatively underexamined, particularly in relation to psychological wellbeing. Current findings contrast the broader literature which suggests multiple group membership is associated with psychological wellbeing (Haslam et al., 2008). One explanation for this is that the ability to maintain valued groups may be more important than having a broad pool to draw on. Much of the evidence base has focussed on patients (e.g., Anderson & Whitfield, 2013; Muldoon et al., 2019), the present findings highlight the potential value of applying a SIT lens to caregiving.

Clinical Implications

Although causal inferences cannot be drawn due to the study design, the findings invite reflection on how interventions might support carers to maintain connection to valued group identities.

Though social prescribing approaches emphasise new group membership may be helpful (Aggar et al., 2025), interventions could involve more than encouraging membership to generic groups (e.g., Carers UK). Instead, support services may be particularly effective

when they help sustain connection with pre-existing valued identities, rather than developing new memberships.

Assessment: Supporting Identity Continuity

Clinicians may explore pre-stroke valued roles with carers using a structured approach involving identity-orientated tools. For example, an adaption of the Life Goals Questionnaire (Nair & Wade, 2003) which was designed for patients in neurorehabilitation services to reconnect with valued roles and guide goal-setting around identity reconstruction. Structured exploration may support carers to maintain aspects of their pre-caregiving identity and offer avenues to develop strategies alongside caregiving. Further research would be required to adapt and validate the measure.

Intervention: Facilitating Identity Continuity

Interventions may prioritise strategies to maintain connection to valued group identities. This may involve flexible and creative ways to remain connected to an important group, where full participation is no longer feasible. For example, where employment is highlighted as important though the carer is unable to work full-time, they may be supported to maintain contact with colleagues, seek reduced-hours or voluntary roles. The frequency, format or level of participation may present as opportunities for adaption.

Assessment & Intervention: Carer Burden

Routine screening using validated measures (e.g., MCSI) could be addended to post-stroke follow-up appointments, allowing for timely support. Based on the results of the present study, interventions addressing both carer identity and burden may be most efficacious. This may be through adapted Cognitive-Behavioural and Acceptance and Commitment-based interventions (Hayes et al., 2016); for example, reframing maladaptive beliefs about caregiving (e.g., “I must do everything myself”) in conjunction with work on strengthening values-based action (Hayes et al., 2016). This may include protecting and

reconnecting with social identities which may encourage viewing caregiving as a distinct identity, and support reconnection with activities that reinforce pre-stroke identity. This integrative approach may encourage re-appraisal of the caregiving role whilst also sustaining a sense of self.

Limitations

Given the cross-sectional design, causality cannot be inferred and temporal ordering between identity continuity and caregiver burden cannot be determined. Whilst the findings are consistent with theoretical predictions from SIT suggesting that identity continuity may reduce burden (Haslam et al., 2008), it is also plausible that carers experiencing lower burden may be better able to maintain valued social identities. Longitudinal designs are needed to clarify whether continuity functions as a protective factor, or whether reduced burden supports preservation of pre-existing identities. Additionally, as the measures of burden and wellbeing both index emotional distress and functional impact, it is possible that the strong association between the two may have been inflated and reduced the likelihood of detecting unique predictors when both were included in the same model.

Several contextual and potentially confounding variables were not controlled for, including hours spent caring, time since stroke, and socioeconomic status. These factors may influence both identity continuity and burden and should be considered in future research. Furthermore, although the EXITS includes a ‘New Group Membership’ subscale, this was not included in the present study. The potential influence of newly formed group memberships on carers’ wellbeing or burden was therefore not controlled for, this should be considered in future research.

The sample was drawn from a single database resulting in predominantly White British spousal sample, within Oxfordshire or Buckinghamshire. The role of British cultural norms around caregiving, family roles and help-seeking may differ from other populations. In

contrast to individualistic Western cultures that prioritise personal identity and autonomy, collectivist cultures conceptualise caregiving as a norm entrenched within relational and interdependent identities (Ng & Indran, 2021). Therefore, the role of caregiving may represent identity reaffirmation of cultural and familial norms rather than identity disruption, requiring continuity. Consequently, the underlying mechanisms that uphold identity continuity as protective against carer burden, may function differently and be influential to a lesser degree in collectivist cultures.

Bias

Eligibility criteria were applied to reduce selection bias, although reliance on a pre-existing database limited representativeness. Recruitment was limited by region. Recall bias was possible due to retrospective reporting of pre-stroke group memberships. Measurement bias was minimised through the use of validated psychometric instruments.

Future Research

Longitudinal designs may assess when and how multiple group membership and social identity continuity may change, or exert their strongest effects, potentially highlighting timepoints for interventions. Diverse samples are needed to capture perspectives from ethnic minorities and non-spouse carers; allowing for an understanding of how different cultures and family dynamics intersect with social identity, and whether identity continuity is protective cross-culturally. Qualitative studies may provide valuable insight into how carers experience identity changes following stroke. For example, interviews could explore how carers perceive the disruption of pre-existing roles, strategies used to maintain valued identities, and how identity continuity influences their perception of burden over time. Future research may assess whether carer interventions, supporting identity continuity, lead to reductions in burden and improve wellbeing.

Future research may examine whether associations differ according to carer characteristics such as gender and relationship to the stroke survivor. The present sample was predominantly female, reflecting broader evidence that women are more likely to assume caregiving roles (Pinquart & Sörensen, 2003). Gender differences may also influence engagement with social identities, as women may be more likely to maintain or invest in social relationships and group participation than men (Shin & Park, 2023).

The experience of caregiving may vary depending on the relationship to the survivor. Spousal carers often cohabit with the survivor and may experience caregiving as an extension or marital commitment or obligation, whereas adult children may balance caregiving with employment, parenting and other roles. These differing role structures may influence both opportunities to maintain pre-existing identities and the extent to which caregiving disrupts social participation. Future studies may explore whether the relationships observed in the present study vary across gender and caregiver-survivor relationship.

Conclusion

The study provides evidence that maintaining valued pre-stroke group memberships is associated with lower perceived burden amongst stroke carers, when controlling for PSCI. Multiple pre-caregiving group memberships were not found to offer a significant contribution to wellbeing beyond burden. The findings suggest that in the context of chronic, high-intensity caregiving, supporting carers to preserve pre-stroke group identities may be an avenue for reducing carer burden.

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Executive Summary

Informal carers are central to community stroke rehabilitation, yet caregiving is frequently associated with high psychological burden and reduced wellbeing. While existing models of caregiving have largely conceptualised outcomes in terms of individual stress appraisal and coping, these approaches give limited attention to the broader social and identity-related contexts in which caregiving occurs. Social Identity Theory (SIT) offers an alternative framework, proposing that continuity of valued group memberships and social identities across major life transitions may protect psychological adjustment. However, this has been under-examined in stroke caregiving contexts, particularly in relation to known clinical factors such as post-stroke cognitive impairment (PSCI).

This Theory-Driven Research Project examined whether social identity resources explain variation in carers' psychological wellbeing and perceived burden beyond clinical influences, specifically six-month PSCI. Using a cross-sectional dyadic design, 55 stroke survivor–carer dyads were recruited from the Oxford Cognitive Screen–Recovery (OCS-Recovery) research database. Carers completed validated self-report measures of psychological wellbeing (Psychological General Wellbeing Index), perceived burden (Modified Caregiver Strain Index), pre-stroke multiple group membership, and social identity continuity (Exeter Identity Transitions Scales). Survivors' six-month post-stroke cognitive impairment was indexed using Oxford Cognitive Screen performance, operationalised as the proportion of subtasks failed. Hierarchical multiple regression analyses were conducted to test theoretically derived hypotheses, examining the unique contribution of social identity variables beyond clinical factors.

Findings demonstrated that social identity continuity was a significant negative predictor of perceived carer burden, independent of six-month PSCI. Carers who maintained stronger continuity of valued group memberships and identities reported significantly lower

levels of caregiving burden, even when controlling for cognitive impairment. In contrast, pre-stroke multiple group membership did not significantly predict carers' psychological wellbeing once perceived burden and PSCI were accounted for. Carer burden was strongly associated with reduced wellbeing, indicating that burden represents a key psychological pathway through which caregiving impacts mental health. Taken together, the findings suggest that identity continuity may exert its protective effects primarily by shaping carers' experience and appraisal of burden, rather than operating as an independent direct predictor of wellbeing.

These findings support key predictions derived from Social Identity Theory, extending the literature by demonstrating the relevance of identity continuity within chronic stroke caregiving contexts. Importantly, the results indicate that continuity of valued identities may be more salient for carers' psychological adjustment than the pre-caregiving group memberships alone. This may offer an extension to existing SIT assumptions by suggesting that maintaining meaningful identity connections may be more important than simply having multiple identities prior to role transition, particularly when caregiving becomes an embedded and enduring life role, spanning years.

Clinically, the findings highlight the potential value of interventions that move beyond generic support provision and instead support carers to maintain connection with valued roles, identities, and social groups. Alongside routine assessment and monitoring of carer burden, services may benefit from adopting more identity-informed approaches that help carers sustain continuity with meaningful aspects of their pre-caregiving lives. Supporting identity continuity may therefore represent a clinically meaningful, theoretically informed pathway for reducing psychological burden and promoting longer-term psychological adjustment in stroke caregiving.

Connecting Narrative

Across my projects, I became increasingly interested in how psychological experiences are shaped not only by individual factors but also by wider social, organisational, and epistemological influences. Although my Theory-Driven Research Project (TDRP), Systematic Review of the Literature (SRL), and Service Improvement Project (SIP) addressed different applied questions and used different methodologies, they were connected by a shared concern with how psychological phenomena are embedded within systems of meaning, power, and professional practice. Conducting these projects prompted reflection not only on the research topics themselves, but also on my own position within the research process and the contexts in which knowledge in clinical psychology is generated.

Conducting interviews with carers for my TDRP prompted reflection on the boundaries between my role as a researcher and my identity as a trainee clinical psychologist. Several participants described emotionally demanding caregiving experiences, and at times I noticed a pull towards responding therapeutically or offering support beyond the research context. Maintaining the position of researcher required conscious effort to remain attentive to participants' narratives without moving into a therapeutic role. Reflecting on this tension highlighted the importance of clear role boundaries in clinical research, and increased my awareness of how easily professional identities as clinician and researcher can overlap, particularly when working with participants experiencing distress.

While my TDRP highlighted the importance of social context in shaping carers' experiences, my SRL prompted reflection on a different form of context, the epistemological assumptions underlying psychological measurement. The review examined the psychometric properties of a widely used measure of post-concussion symptoms. Conducting the review required engaging critically with statistical models, and through this process I became increasingly aware of how psychological experiences are not only observed but also

constructed through the tools used to measure them. The variability in the RPQ's factor structure across studies highlighted how interpretations of symptoms can shift depending on the analytic approach taken, raising broader questions about the relationship between how we understand the process we aim to measure.

My SRL also prompted reflection on the social context of research production itself. My supervisor had been involved in the development of the RPQ and had authored a study included in the review. This created a complex dynamic in which I was acutely aware of the power dynamics both of being evaluated and being the evaluator. Whilst my supervisor provided valuable insight into the historical development of the measure, his involvement in the project also required careful consideration of how to maintain independence in the appraisal process. During supervision we openly discussed how to approach the evaluation of the study he authored, including how COSMIN risk of bias criteria should be applied consistently across all papers. These discussions highlighted the importance of transparency and reflexivity when conducting research, particularly when there may be differing motivations or interests within the research team. Navigating this tension both within myself internally, and with my supervisor, helped me develop greater awareness of how professional relationships and intellectual investments can shape the interpretation of research evidence.

Reflecting on these experiences also led me to consider how professional hierarchies shape the research process itself. Across both the SRL and SIP, I was conducting research as a trainee under the supervision of senior clinicians who had been directly involved in developing the measure or intervention being evaluated. Navigating this dynamic required careful consideration of how to maintain critical independence while also working within supervisory relationships characterised by expertise and authority. I was aware of my own position both as a trainee, but also how I may be potentially perceived as a threat to works that my supervisors have contributed to.

Regarding my SIP, my supervisor had also been involved in developing the training being evaluated. As with the SRL, this raised questions about the relationship between programme development and evaluation, and how these roles might influence the framing of the research. Conducting the evaluation required me to remain attentive to how these contextual factors could shape both my own interpretations and the broader framing of the project.

At the same time, my own positionality was particularly salient within this project. As a trainee clinical psychologist from an ethnic minority background, anti-racism within the profession was a profoundly personal topic for me. While my positionality had been reflected upon explicitly within the SIP itself, I have since considered how my experiences of training shaped the broader questions I was drawn to across my thesis. In particular, the SIP heightened my awareness of how organisational cultures, professional hierarchies, and implicit norms influence both psychological practice and the research questions considered legitimate within the field.

The project also prompted reflection on power and hierarchy within professional contexts. As a trainee interviewing and analysing the accounts of senior clinicians, I was aware of the potential influence of professional hierarchies on both the data collection and analytic processes. I noticed my emotional responses to the data and considered how these responses might relate to my position within the training programme. Reflecting on these dynamics reinforced the importance of acknowledging how power relations shape both organisational cultures and the research processes used to examine them.

Across the three projects, engaging with these methodological and relational tensions reinforced the importance of reflexivity in psychological research. Whether considering the social identities of carers, the assumptions underlying psychometric measurement, or the organisational dynamics influencing anti-racism training, each project highlighted how

knowledge production within clinical psychology is shaped by broader social and institutional contexts. Conducting the thesis therefore involved not only examining psychological phenomena, but also reflecting on the positions from which such phenomena are studied and interpreted.

Acknowledgments

I am deeply grateful to those who took part in my research, particularly the carers and stroke survivors for their generosity in sharing their time, experiences and perspectives, and for welcoming me into their families and homes. Their openness and trust made this research possible. I would also like to thank my research supervisors and course tutor for their guidance, support and expertise throughout this process. Finally, I would like to thank my family and loved ones for their patience, encouragement, and belief in me. In particular, I am profoundly grateful to my parents, whose unwavering love and support sustained me throughout this journey, this thesis would not have been possible without them.

Appendices

Systematic Review of the Literature

Appendix A: Author Guidelines

Journal: Neuropsychological Rehabilitation

Preparing Your Paper

All authors submitting to medicine, biomedicine, health sciences, allied and public health journals should conform to the Uniform Requirements for Manuscripts Submitted to Biomedical Journals, prepared by the International Committee of Medical Journal Editors (ICMJE).

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Appendix B: COSMIN

Content Validity

Content validity of existing PROMs can be assessed by asking patients and professionals about the relevance, comprehensiveness and comprehensibility of the items, response options, and instructions. In the box on content validity, standards are given for studies on content validity in which patients are involved, as well as studies in which professionals are involved.

Content validity	**very good**	**adequate**	**doubtful**	**inadequate**	**NA**	**Justification**
Design requirements						
1 From the perspective of the patients: use an appropriate method for assessing (1) the relevance of each item for the patients' experience with the condition, **AND** (2) the comprehensiveness of the PROM, **AND** (3) the comprehensibility of the PROM instructions, items, response options, and recall period	Widely recognized or well justified method for qualitative research will be used to assess the three aspects	Only quantitative (survey) method(s) will be used or assumable that the method used will be appropriate but not clearly described, but all three aspects will be assessed	Not clear if patients will be asked whether each item is relevant AND comprehensible AND whether items together are comprehensive, or doubtful whether the method will be appropriate	Method used are not appropriate or patients will not be asked about the relevance, comprehensiveness or comprehensibility of all items		RoB Box 2 (1, 8, 15)
2 From the perspective of professionals: use an appropriate method for assessing (1) the relevance of each item for the construct of interest, **AND** (2) the comprehensiveness of the PROM	Widely recognized or well justified method for qualitative research will be used to assess the two aspects	Only quantitative (survey) method(s) will be used or assumable that the method used will be appropriate but not clearly described, but both aspects will be assessed	Not clear if professionals will be asked whether each item is relevant AND items together are comprehensive, or doubtful whether the method will be appropriate	Method used are not appropriate or professionals will not be asked about the relevance or comprehensiveness of all items	Not applicable	RoB Box 2 (22, 27)

3	Include professionals from all relevant disciplines	Professionals from all required disciplines will be included	Assumable that professionals from all required disciplines will be included, but not clearly described	Doubtful whether professionals from all required disciplines will be included or relevant professionals will not be included		Not applicable	RoB Box 2 (28, 23)
4	Evaluate each item in an appropriate number of patients or professionals For qualitative studies For quantitative (survey) studies	 ≥7 ≥50	 4-6 30 - 49	 <4 or not clear <30 or not clear			RoB Box 2 (2, 9, 16, 24, 29)
5	Use skilled group moderators or interviewers	Skilled group moderators or interviewers will be used	Group moderators or interviewers have limited experience or will be trained specifically for the study	Not clear if group moderators or interviewers will be trained or group moderators /interviewers are not trained and have no experience		Not applicable	RoB Box 2 (3, 10, 17)
6	Base the group meetings or interviews on an appropriate topic or interview guide	Appropriate topic or interview guide will be used	Assumable that the topic or interview guide will be appropriate, but not clearly described	Not clear if a topic guide will be used or doubtful if topic or interview guide will be appropriate or no guide used		Not applicable	RoB Box 2 (4, 11, 18)
7	Record and transcribe verbatim the group meetings or interviews	All group meetings or interviews will be recorded and transcribed verbatim	Assumable that all group meetings or interviews will be recorded and transcribed verbatim, but not clearly described	Not clear if all group meetings or interviews will be recorded and transcribed verbatim or recordings will not be transcribed verbatim or only notes will be made during the group meetings/ interviews	No recording and no notes	Not applicable	RoB Box 2 (5, 12, 19)

Analyses						
8 Use an appropriate approach to analyse the data	A widely recognized or well justified approach will be used	Assumable that the approach will be appropriate, but not clearly described	Not clear what approach will be used or doubtful whether the approach will be appropriate	Approach not appropriate		RoB Box 2 (6, 13, 20, 25, 30)
9 Involve at least two researchers in the analysis	At least two researchers will be involved in the analysis	Assumable that at least two researchers will be involved in the analysis, but not clearly described	Not clear if two researchers will be included in the analysis or only one researcher will be involved in the analysis		Not applicable	RoB Box 2 (7, 14, 21, 26, 31)

Structural validity

A PROM can be based on a reflective or on a formative model [8-10]. A reflective model is a model in which all items are a manifestation of the same underlying construct. These items are called effect indicators and are expected to be highly correlated and interchangeable. In a formative model – its counterpart – the items together form the construct. These items do not need to be correlated. It should be described in the protocol whether the PROM is based on a reflective or a formative model. Structural validity is only relevant for PROMs that are based on a reflective model.

When the aim of the study is to assess the structural validity of a multidimensional PROM, a factor analysis should be performed on the whole scale. However, when the aim is to additionally assess unidimensionality of subscales, a factor analysis could also be performed on each subscale separately.

Structural validity	**very good**	**adequate**	**Doubtful**	**inadequate**	**NA**	**Justification**
Statistical methods						
1 For CTT: perform confirmatory factor analysis	Confirmatory factor analysis will be performed	Exploratory common factor analysis will be performed		No exploratory or confirmatory factor analysis will be performed	Not applicable	RoB Box 3 (1)
2 For CTT: provide clear information on how the factor analysis will be performed, e.g. software program, method of estimation, whether and how assumptions will be checked, rotation method, criteria for model fit.	Clear information on the performance of the analysis is provided		Clear information on some of the aspects for performing the analysis is provided	Unclear how the analysis will be performed	Not applicable	Original CC
3 For IRT/Rasch: choose a model that fits to the research question	Chosen model fits well to the research question	Assumable that the chosen model fits well to the research question	Doubtful if the chosen model fits well to the research question	Chosen model does not fit to the research question	Not applicable	RoB Box 3 (2)
4 For IRT/Rasch: provide clear information on how the IRT or Rasch analysis will be performed, e.g. software program, which IRT or Rasch model used, method of estimation, whether and how assumptions will be checked, criteria for model fit.	Clear information on the performance of the analysis is described		Clear information on some of the aspects for performing the analysis is described	Unclear how the analysis will be performed	Not applicable	Original CC

5	Perform the analysis in a sample with an appropriate number of patients (taking into account expected number of missing values)	FA: 7 times number of items and ≥100 Rasch/1PL models: ≥ 200 patients 2PL parametric IRT models OR Mokken scale analysis: ≥ 1000 patients	FA: at least 5 times number of items and ≥100 OR at least 6 times number of items but <100 Rasch/1PL models: 100-199 patients 2PL parametric IRT models OR Mokken scale analysis: 500-999 patients	FA: 5 times number of items but <100 Rasch/1PL models: 50-99 patients 2PL parametric IRT models OR Mokken scale analysis: 250-499 patients	FA: < 5 times number of items Rasch/1PL models: < 50 patients 2PL parametric IRT models OR Mokken scale analysis: < 250 patients		RoB Box 3 (3)
6	Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described		The way missing items will be handled is not clearly described			Original CC

Internal consistency

Like structural validity, internal consistency is only relevant for PROMs based on a reflective model. Furthermore, internal consistency should be assessed for unidimensional (sub)scales. Therefore, unidimensionality or structural validity using e.g. factor analysis should be assessed for each scale or subscale in the study or evidence for structural validity obtained in a previous study in a sample from a comparable target population should be available.

Internal consistency	very good	adequate	doubtful	inadequate	NA	Justification
Design requirements						
1 Check whether a scale or a subscale is unidimensional	Evidence provided that each scale or subscale is unidimensional		Unclear whether each scale or subscale is unidimensional	the scale or subscale is NOT unidimensional		RoB Box 4 (1)
2 Perform the analysis in a sample with an appropriate number of patients (taking into account expected number of missing values)	≥100 patients	50-99 patients	30-49 patients	<30 patients		Sample size
3 Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described		The way missing items will be handled is not clearly described			Original CC
Statistical methods						
4 For continuous scores: calculate Cronbach's alpha or Omega for each unidimensional scale or subscale	Cronbach's alpha, or Omega will be calculated		Only item-total correlations will be calculated	No Cronbach's alpha and no item-total correlations will be calculated	Not applicable	RoB Box 4 (2)
5 For dichotomous scores: calculate Cronbach's alpha or KR-20 for each unidimensional scale or subscale	Cronbach's alpha or KR-20 will be calculated		Only item-total correlations will be calculated	No Cronbach's alpha or KR-20 and no item-total correlations will be calculated	Not applicable	RoB Box 4 (3)

6	For IRT-based scores: calculate standard error of theta (SE (θ)) or reliability coefficient of estimated latent trait value (index of (subject or item) separation) for each unidimensional scale or subscale	SE(θ) or reliability coefficient will be calculated		SE(θ) or reliability coefficient will NOT be calculated	Not applicable	RoB Box 4 (4)

Cross-cultural validity\measurement invariance

This measurement property aims to investigate whether items of a PROM behaves similarly in different populations, for example in different ethnicity or language groups, different gender or age groups or different disease populations. Therefore, data is needed from multiple groups (e.g. multiple language groups).

Cross-cultural validity\Measurement invariance	**very good**	**adequate**	**doubtful**	**inadequate**	**NA**	**Justification**
Design requirements						
1 Provide a clear description of the group variable(s), including dichotomization or categorization	The group variable(s) is/are clearly described	Assumable how the group variable will be dichotomized or categorized but not clearly described		The group variable(s) is/are not clearly described		RoB Box 5 (1)
2 Provide a clear description of the relevant characteristics of the patients that should be similar in both subgroups, such as demographic or disease characteristics	Relevant characteristics are clearly described			Relevant characteristics are clearly described		RoB Box 5 (2)
3 Perform the analysis in a sample with an appropriate number of patients (taking into account expected number of missing values)	Regression analyses or IRT/Rasch based analyses: ≥200 patients per group OR MGCFA*: 7 times number of items and ≥100 patients	150-199 patients per group OR 5 times number of items and ≥100 OR 5-7 times number of items but <100 patients	100-149 patients per group OR 5 times number of items but <100 patients	<100 patients per group OR <5 times number of items		RoB Box 5 (3)

Statistical methods						
4 For CTT: perform a multi-group confirmatory factor analysis (MGCFA)	MGCFA will be performed			No confirmatory factor analysis will be performed	Not applicable	RoB Box 5 (2)
5 For CTT: provide clear information on how the factor analysis will be performed, e.g. software program, method of estimation, criteria for model fit, and whether and how assumptions were checked	Clear information on the performance of the analysis is provided		Clear information on some of the aspects for performing the analysis is provided	Unclear how the analysis will be performed	Not applicable	RoB Box 5 (2)
6 For IRT/Rasch: perform differential item functioning (DIF) analyses	DIF will be performed			DIF will not be performed	Not applicable	RoB Box 5 (2)
7 For IRT/Rasch: provide clear information on how the IRT or Rasch analysis will be performed, e.g. software program, which IRT or Rasch model used, method of estimation, criteria for model fit, whether and how assumptions were checked	Clear information on the performance of the analysis is provided		Clear information on some of the aspects for performing the analysis is provided	Unclear how the analysis will be performed	Not applicable	RoB Box 5 (2)
8 Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described		The way missing items will be handled is not clearly described			Original CC

Measurement error and reliability

Measurement error and reliability can be calculated based on the same study design and data collection. Basically, two measurements are needed in a group of people who are all assumed to be stable on the construct to be measured. As the design and the data collected can be used for both measurement properties, we present the standards in one box. Only the statistical parameters are different. We strongly encourage researchers who use such a design to report measurement error in addition to a reliability parameter.

Measurement error and reliability	**very good**	**adequate**	**doubtful**	**inadequate**	**NA**	**Justification**
Design requirements						
1 Use at least two measurements	At least two measurements			Only one measurement		Original CC
2 Ensure that the administrations will be independent	Independent measurements	Assumable that the measurements will be independent	Doubtful whether the measurements will be independent	measurements NOT independent		New
3 Ensure that the patients will be stable in the interim period on the construct to be measured	Patients will be stable (evidence provided)	Assumable that patients will be stable	Unclear if patients will be stable	Patients will NOT be stable		RoB Box 6/7 (1)
4 Use an appropriate time interval between the two measurements, which is long enough to prevent recall, and short enough to ensure that patients remain stable	Time interval appropriate		Doubtful whether time interval is appropriate or time interval is not stated	Time interval NOT appropriate		RoB Box 6/7 (2)
5 Ensure that the test conditions will be similar for the measurements (e.g. type of administration, environment, instructions)	Test conditions similar (evidence provided)	Assumable that test conditions similar	Unclear if test conditions will be similar	Test conditions will NOT be similar		RoB Box 6/7 (3)
6 Perform the analysis in a sample with an appropriate number of patients (taking into account expected number of missing values)	≥100 patients	50-99 patients	30-49 patients	<30 patients		Sample size

Statistical methods for measurement error							
7	For continuous scores: calculate the Standard Error of Measurement (SEM), Smallest Detectable Change (SDC) or Limits of Agreement (LoA)	SEM, SDC, or LoA will be calculated, and model or formula is clearly described*	SEM or SDC will be calculated, but model or formula of the SEM or SDC is not described or not optimal**		SEM will be calculated based on Cronbach's alpha, or on SD from another population	Not appli-cable	RoB Box 7 (4)
8	For dichotomous/nominal/ordinal scores: calculate the percentage (positive and negative) agreement	% positive and negative agreement will be calculated	% agreement will be calculated		% agreement will not be calculated	Not applicable	RoB Box 7 (5)
9	Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described		The way missing items will be handled is not clearly described			Original CC
Statistical methods for reliability							
7	For continuous scores: calculate an intraclass correlation coefficient (ICC)	ICC will be calculated, and model or formula of the ICC is clearly described*	ICC will be calculated, but model or formula of the ICC not described or not optimal**	Pearson or Spearman correlation coefficient will be calculated	No ICC or Pearson or Spearman correlations calculated	Not applicable	RoB Box 6 (4)
8	For dichotomous/nominal/ordinal scores: calculate kappa	Kappa will be calculated			No kappa will be calculated	Not applicable	RoB Box 6 (5)
9	For ordinal scores: calculate a weighted kappa	Weighted Kappa calculated and weighting scheme is described		Unweighted Kappa will be calculated or not described if Kappa will be weighted		Not applicable	RoB Box 6 (6, 7)
10	Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described		The way missing items will be handled is not clearly described			Original CC

* The model (i.e. one-way random effect model or two-way random or mixed effect model), type (i.e. for single or multiple measurement) and definition (i.e. for consistency or absolute agreement) of the ICC that will be calculated is appropriately chosen and described (see [11]); ** ICC formula does not correspond to the research question

Criterion validity

As PROMs measure constructs that can only be reported by the patients themselves, no gold standards exists for these measures. The only exception is the long version when investigating a short version of the same PROM.

Criterion validity	very good	adequate	doubtful	inadequate	NA	Justification
Design requirements						
1 Describe whether the proposed criterion can be considered as a reasonable 'gold standard'	Criterion can be considered an adequate 'gold standard' (evidence provided)	No evidence provided, but assumable that the criterion can be considered an adequate 'gold standard'	Unclear whether the criterion can be considered an adequate 'gold standard'	Criterion can NOT be considered an adequate 'gold standard'		Original CC
2 Perform the analysis in a sample with an appropriate number of patients (taking into account expected number of missing values)	≥ 50 patients in the smallest group	30-50 patients in the smallest group	<30 patients in biggest group			Sample size
3 Use an appropriate time schedule for assessments of the PROM of interest and 'gold standard'	PROM and gold standard will be administered at the same time	PROM and gold standard not administered at the same time, but assumable that patient will not change in the interim period	PROM and gold standard will not be administered at the same time, but unclear if patients will changed	PROM and gold standard will not be administered at the same time, and patients are expected to change		New
Statistical methods						
4 For continuous scores: calculate correlations, or the area under the receiver operating curve	Correlations or AUC will be calculated			Correlations or AUC will NOT be calculated	Not applicable	RoB Box 8 (1)

5	For dichotomous scores: determine sensitivity and specificity	Sensitivity and specificity will be determined		Sensitivity and specificity will NOT be determined	Not applicable	RoB Box 8 (2)
6	Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described	The way missing items will be handled is not clearly described			Original CC

AUC = Area under the Receiver Operator Curve (ROC) curve

Hypotheses testing for construct validity

As no 'gold standards' exist for PROMs, the commonly used way to investigate validity of PROMs is to test hypotheses about 1) expected relationships with other outcomes measures of good quality (Part A), and/or 2) expected differences between relevant groups (Part B). It is of major importance to define hypotheses in advance when assessing construct validity of a PROM, to enable the authors to draw unbiased conclusions after data collection and analyses.

Hypotheses testing for construct validity **A. Comparison with other outcome measurement instruments (convergent validity)**	**very good**	**adequate**	**doubtful**	**inadequate**	**NA**	**Justification**
Design requirements						
1 Formulate hypotheses about expected relationships between the PROM under study and other outcome measurement instrument(s)	Hypotheses formulated including the expected direction and magnitude of the correlations stated		Hypotheses vague or not formulated but possible to deduce what was expected	Unclear what is expected		Original CC
2 Provide a clear description of the construct(s) measured by the comparator instrument(s)	Construct(s) measured by the comparator instrument(s) is/are clearly described			Construct(s) measured by the comparator instrument(s) is/are not clearly described		RoB Box 9a (1)
3 Use comparator instrument(s) with sufficient measurement properties	Sufficient measurement properties of the comparator instrument(s) in a population similar to the study population	Sufficient measurement properties of the comparator instrument(s) but not sure if these apply to the study population	Some information on measurement properties (or a reference to a study on measurement properties) of the comparator instrument(s) in any study population	No information on the measurement properties of the comparator instrument(s), or evidence of insufficient measurement properties of the comparator instrument(s)		RoB Box 9a (2)

4	Perform the analysis in a sample with an appropriate number of patients (taking into account expected number of missing values)	≥100 patients	50-99 patients	30-49 patients	<30 patients	Sample size
5	Use an appropriate time schedule for assessments of the PROM of interest and comparison instruments	PROM and comparison instrument(s) will be administered at the same time	PROM and comparison instrument(s) not administered at the same time, but assumable that patient will not change in the interim period	PROM and comparison instrument(s) will not be administered at the same time, but unclear if patients will changed	PROM and comparison instrument(s) will not be administered at the same time, and patients are expected to change	New
Statistical methods						
6	Use statistical methods that are appropriate for the hypotheses to be tested	Statistical methods will be appropriate	Assumable that statistical methods will be appropriate	Statistical methods will not be optimal	Statistical methods will NOT be appropriate	RoB Box 9a (3)
7	Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described		The way missing items will be handled is not clearly described		Original CC

B. Comparison between subgroups (discriminative or known-groups validity)	very good	adequate	doubtful	inadequate	NA	Justification
Design requirements						
1 Formulate hypotheses regarding mean differences between subgroups	Hypotheses formulated including the expected directions and magnitude of the mean differences stated		Hypotheses vague or not formulated but possible to deduce what was expected	Unclear what was expected		Original CC
2 Provide an adequate description of important characteristics of the subgroups, such as disease or demographic characteristics	Adequate description of the important characteristics of the subgroups	Adequate description of most of the important characteristics of the subgroups	Poor of no description of the important characteristics of the subgroups			RoB Box 9b (5)
3 Perform the analysis in a sample with an appropriate number of patients (taking into account expected number of missing values)	≥100 patients per group	50-99 patients per group	30-49 patients per group	<30 patients per group		Sample size
Statistical methods						
4 Use statistical methods that are appropriate for the hypotheses to be tested	Statistical methods will be appropriate	Assumable that statistical methods will be appropriate	Statistical methods will not be optimal	Statistical methods will NOT be appropriate		RoB Box 9b (6)
5 Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described		The way missing items will be handled is not clearly described			Original CC

Responsiveness

Responsiveness is considered to indicate longitudinal validity. When a 'gold standard' is available, the criterion approach Part A of this box can be used. When testing hypotheses about change scores of PROMs compared to other outcome measurement instruments, Part B can be used; for comparison of changes scores of PROMs between subgroups Part C can be used; and when testing hypotheses about expected change scores of PROMs before and after intervention, Part D can be used. It is of major importance to define hypotheses in advance when assessing responsiveness of a PROM, to enable the authors to draw unbiased conclusions after data collection and analyses.

Responsiveness ***A. Criterion approach (i.e. comparison to a 'gold standard')***						
	very good	**adequate**	**doubtful**	**inadequate**	**NA**	**Justification**
Design requirement						
1 The proposed criterion can be considered as a reasonable 'gold standard'	Criterion can be considered an adequate 'gold standard' (evidence provided)	No evidence provided, but assumable that the criterion can be considered an adequate 'gold standard'	Unclear whether the criterion can be considered an adequate 'gold standard'	Criterion can NOT be considered an adequate 'gold standard'		Original CC
2 Use an appropriate time schedule for assessments of the PROM of interest and the gold standard	PROM and gold standard will be administered at the same time at all occasions	PROM and gold standard not administered at the same time, but assumable that patient will not change in the interim period at all occasions	PROM and gold standard will not be administered at the same time, but unclear if patients will changed	PROM and gold standard will not be administered at the same time, and patients are expected to change		New
3 Use an appropriate time interval between first and second measurements	Time interval will be appropriate			Time interval will NOT be appropriate		New

4	Describe anything likely to occur in the interim period (e.g. intervention, in case of progressive disease, other relevant events)	Anything likely to occur during the interim period (e.g. treatment) is adequately described		Unclear or NOT described what will likely to occur during the interim period			Original CC
5	Ensure that a proportion of the patients is likely to change (i.e. improvement or deterioration) on the construct to be measured	Part of the patients is likely to change (evidence provided)	NO evidence provided, but assumable that part of the patients will change	Unclear if part of the patients will change	Patients will likely NOT change		Original CC
6	Perform the analysis in a sample with an appropriate number of patients (taking into account expected number of missing values)	≥50 patients in the smallest group	30-50 patients in the smallest group	<30 patients in biggest group			Sample size
	Statistical methods						
7	For continuous scores: calculate correlations between change scores, or the area under the Receiver Operator Curve (ROC) curve (AUC)	Correlations or AUC will be calculated			Correlations or AUC will NOT be calculated	Not applicable	RoB Box 10a (1)
8	For dichotomous scales: calculate sensitivity and specificity (changed versus not changed)	Sensitivity and specificity will be calculated			Sensitivity and specificity will NOT be calculated	Not applicable	RoB Box 10a (2)
9	Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described		The way missing items will be handled is not clearly described			Original CC

B. Construct approach (i.e. hypotheses testing; comparison with other outcome measurement instruments)	**very good**	**adequate**	**doubtful**	**inadequate**	**NA**	**Justification**
Design requirements						
1 Formulate hypotheses about expected relationships between the change scores on the PROM under study and (change scores on) other outcome measurement instrument(s)	Hypotheses will be formulated including the expected direction and magnitude of the correlations stated		Hypotheses vague or will not be formulated but possible to deduce what was expected	Unclear what is expected		Original CC
2 Provide a clear description of the construct(s) measured by the comparator instrument(s)	Constructs measured by the comparator instrument(s) is/are clearly described			Constructs measured by the comparator instrument(s) is/are not clearly described		RoB Box 10b (4)
3 Provide information that the measurement properties of the comparator instrument(s) are sufficient	Sufficient measurement properties of the comparator instrument(s) in a population similar to the study population	Sufficient measurement properties of the comparator instrument(s) but not sure if these apply to the study population	Some information on measurement properties (or a reference to a study on measurement properties) of the comparator instrument(s) in any study population	No information on the measurement properties of the comparator instrument(s), or evidence of insufficient measurement properties of the comparator		RoB Box 10b (5)

4	Use an appropriate time schedule for assessments of PROM of interest and comparison instruments	PROM and comparison instrument will be administered at the same time at all occasions	PROM and comparison instrument not administered at the same time, but assumable that patient will not change in the interim period at all occasions	PROM and comparison instrument will not be administered at the same time, but unclear if patients will changed	PROM and comparison instrument will not be administered at the same time, and patients are expected to change	New
5	Use an appropriate time interval between first and second measurements	Time interval appropriate			Time interval NOT appropriate	New
6	Describe anything likely to occur in the interim period (e.g. intervention, other relevant events)	Anything likely to occur during the interim period (e.g. treatment) is adequately described		Unclear or NOT described what will likely to occur during the interim period		Original CC
7	Ensure that a proportion of the patients is likely to change (i.e. improvement or deterioration) on the construct to be measured	Part of the patients is likely to change (evidence provided)	NO evidence provided, but assumable that part of the patients will change	Unclear if part of the patients will change	Patients will likely NOT change	Original CC
8	Perform the analysis in a sample with an appropriate number of patients (taking into account expected number of missing values)	≥100 patients	50-99 patients	30-49 patients	<30 patients	Sample size
Statistical methods						
9	Ensure that the statistical methods are adequate for the hypotheses to be tested	Statistical methods are appropriate	Assumable that statistical methods are appropriate	Statistical methods are not optimal	Statistical methods are NOT appropriate	RoB Box 10b (6)
10	Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described		The way missing items will be handled is not clearly described		Original CC

C. Construct approach: (i.e. hypotheses testing: comparison between subgroups)	very good	adequate	doubtful	inadequate	NA	Justification
Design requirements						
1 Formulate hypotheses regarding differences between change scores of subgroups a priori (i.e. before data collection)	Hypotheses formulated including the expected differences between change scores stated		Hypotheses vague or not formulated but possible to deduce what was expected	Unclear what was expected		Original CC
2 Provide an adequate description about important characteristics of the subgroups, such as disease or demographic characteristics	Adequate description of the important characteristics of the subgroups	Adequate description of most of the important characteristics of the subgroups	Poor or no description of the important characteristics of the subgroups			RoB Box 10c (8)
3 Use an appropriate time interval between first and second administration of the measurement	Time interval appropriate			Time interval NOT appropriate		New
4 Describe anything likely to occur in the interim period (e.g. intervention, progressive disease, other relevant events)	Anything likely to occur during the interim period (e.g. treatment) is adequately described		Unclear or NOT described what will likely to occur during the interim period			Original CC
5 Ensure that a proportion of the patients is likely to change (i.e. improvement or deterioration) on the construct to be measured	Part of the patients is likely to change (evidence provided)	NO evidence provided, but assumable that part of the patients will change	Unclear if part of the patients will change	Patients will likely NOT change		Original CC
6 Perform the analysis in a sample with an appropriate number of patients (taking into account expected number of missing values)	≥100 patients	50-99 patients	30-49 patients	<30 patients		Sample size

Statistical methods					
7 Ensure that the statistical methods are adequate for the hypotheses to be tested	Statistical methods are appropriate	Assumable that statistical methods are appropriate	Statistical methods are not optimal	Statistical methods are NOT appropriate	RoB Box 10c (9)
8 Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described		The way missing items will be handled is not clearly described		Original CC

D. Construct approach: (i.e. hypotheses testing: before and after intervention)	**very good**	**adequate**	**doubtful**	**inadequate**	**NA**	**Justification**
Design requirements						
1 Formulate challenging hypotheses regarding expected changes before and after intervention a priori (i.e. before data collection)	Hypotheses formulated including the expected changes stated		Hypotheses vague or not formulated but possible to deduce what was expected	Unclear what was expected		Original CC
2 Provide an adequate description of the intervention to allow replication, including how and when they will be administered	Adequate description of the intervention		Poor description of the intervention	NO description of the intervention		RoB Box 10d (11)
3 Use an appropriate time interval between first and second administration	Time interval appropriate			Time interval NOT appropriate		New
4 Describe anything likely to occur in the interim period (e.g. intervention, progressive disease, other relevant events) is adequately	Anything likely to occur during the interim period (e.g. treatment) is adequately described		Unclear or NOT described what will likely to occur during the interim period			Original CC

5 Ensure that a proportion of the patients is likely to change (i.e. improvement or deterioration) on the construct to be measured	Part of the patients is likely to change (evidence provided)	NO evidence provided, but assumable that part of the patients will change	Unclear if part of the patients will change	Patients will likely NOT change		Original CC
6 Perform the analysis in a sample with an appropriate number of patients (taking into account expected number of missing values)	≥100 patients	50-99 patients	30-49 patients	<30 patients		Sample size
Statistical methods						
7 Ensure that the statistical methods are adequate for the hypotheses to be tested	Statistical methods are appropriate	Assumable that statistical methods are appropriate	Statistical methods are not optimal	Statistical methods are NOT appropriate		RoB Box 10d (12)
8 Provide a clear description of how missing items will be handled	The way missing items will be handled is clearly described		The way missing items will be handled is not clearly described			Original CC

Appendix C: Search Strategy

Medline

#	Query
1	("Rivermead Post-Concussion Symptoms Questionnaire" or "Rivermead Post Concussion Symptoms Questionnaire" or RPQ).mp.
2	(valid* or reliab* or psychometric* or "measurement propert*" or ("factor analy*" or factor*) or dimensional* or structure* or unidimensional* or multidimensional* or bifactor* or rasch or ("item response theor*" or IRT) or invariance or "measurement invariance" or "internal consistency" or cronbach* or omega or ("test-retest" or "test retest") or stability or reproducibility or "measurement error" or ("standard error of measurement" or SEM) or ("minimal detectable change" or MDC) or responsiveness or "longitudinal change").mp.
3	1 and 2
4	limit 3 to (english language and full text and humans and ("all adult (19 plus years)" or "young adult (19 to 24 years)" or "adult (19 to 44 years)" or "young adult and adult (19-24 and 19-44)" or "middle age (45 to 64 years)" or "middle aged (45 plus years)" or "all aged (65 and over)" or "aged (80 and over)") and english and journal article)

PsycINFO

#	Query
1	("Rivermead Post-Concussion Symptoms Questionnaire" or "Rivermead Post Concussion Symptoms Questionnaire" or RPQ).mp.
2	(valid* or reliab* or psychometric* or "measurement propert*" or ("factor analy*" or factor*) or dimensional* or structure* or unidimensional* or multidimensional* or bifactor* or rasch or ("item response theor*" or IRT) or invariance or "measurement invariance" or "internal consistency" or cronbach* or omega or ("test-retest" or "test retest") or stability or reproducibility or "measurement error" or ("standard error of measurement" or SEM) or ("minimal detectable change" or MDC) or responsiveness or "longitudinal change").mp.
3	1 and 2
4	limit 3 to (full text and peer reviewed journal and human and english language and adulthood <18+ years> and ("300 adulthood (age 18 yrs and older)" or "320 young adulthood (age 18 to 29 yrs)" or "340 thirties (age 30 to 39 yrs)" or "360 middle age (age 40 to 64 yrs)" or "380 aged (age 65 yrs and older)" or "390 very old (age 85 yrs and older)") and "0110 peer-reviewed journal" and journal article and english and human)

Embase

#	Query
1	("Rivermead Post-Concussion Symptoms Questionnaire" or "Rivermead Post Concussion Symptoms Questionnaire" or RPQ).mp.
2	(valid* or reliab* or psychometric* or "measurement propert*" or ("factor analy*" or factor*) or dimensional* or structure* or unidimensional* or multidimensional* or bifactor* or rasch or ("item response theor*" or IRT) or invariance or "measurement invariance" or "internal consistency" or cronbach*

	or omega or ("test-retest" or "test retest") or stability or reproducibility or "measurement error" or ("standard error of measurement" or SEM) or ("minimal detectable change" or MDC) or responsiveness or "longitudinal change").mp.
3	1 and 2
4	limit 3 to (full text and human and english language and embase and english and article and journal and (adult <18 to 64 years> or aged <65+ years>) and "humans only (removes records about animals)")

CINAHL

#	Query
1	("Rivermead Post-Concussion Symptoms Questionnaire" or "Rivermead Post Concussion Symptoms Questionnaire" or RPQ)
2	(valid* or reliab* or psychometric* or "measurement propert*" or ("factor analy*" or factor*) or dimensional* or structure* or unidimensional* or multidimensional* or bifactor* or rasch or ("item response theor*" or IRT) or invariance or "measurement invariance" or "internal consistency" or cronbach* or omega or ("test-retest" or "test retest") or stability or reproducibility or "measurement error" or ("standard error of measurement" or SEM) or ("minimal detectable change" or MDC) or responsiveness or "longitudinal change")
	1 and 2
3	Limits: Human; Exclude MEDLINE records; Peer Reviewed; English Language; Adult: 19-44 years; Middle Aged: 45-64 years; Aged 65+ years; Aged, 80 and over; Linked Full Text; Proximity; Apply equivalent subjects

Web of Science

#	Query
1	("Rivermead Post-Concussion Symptoms Questionnaire" or "Rivermead Post Concussion Symptoms Questionnaire" or RPQ)
2	(valid* or reliab* or psychometric* or "measurement propert*" or ("factor analy*" or factor*) or dimensional* or structure* or unidimensional* or multidimensional* or bifactor* or rasch or ("item response theor*" or IRT) or invariance or "measurement invariance" or "internal consistency" or cronbach* or omega or ("test-retest" or "test retest") or stability or reproducibility or "measurement error" or ("standard error of measurement" or SEM) or ("minimal detectable change" or MDC) or responsiveness or "longitudinal change")
3	1 and 2
3	Refine: English Language; Article

Service Improvement Project

Appendix D: Author Guidelines

Journal: Cultural Diversity & Ethnic Minority Psychology

Title page

The title page should contain the complete title of the manuscript, names and affiliations of all authors, institution(s) at which the work was performed, and name, address, telephone and fax numbers of the author responsible for correspondence.

Please include the word count of the text and abstract.

Authors should also provide a short title of not more than 45 characters (including spaces), and up to 5 key words, that will highlight the subject matter of the article.

Abstract and keywords

All manuscripts must include an abstract containing a maximum of 250 words typed on a separate page. For commentaries and special section/issue introductions, the abstract is limited to 150 words. For research and review articles, the abstract is limited to 250 words and the following headings are required:

- **Objectives:** Study aims or hypotheses. The abstract must begin with this heading (i.e., no sentences should precede the objectives heading)
- **Methods** : Sample description (including size, race or ethnicity, gender, average age) and research design
- **Results:** Results that pertain to study aims or hypotheses
- **Conclusions:** Implication of findings
- After the abstract, please supply up to five keywords or brief phrases. Phrases are limited to three words maximum.

Manuscript preparation

Review APA's Journal Manuscript Preparation Guidelines before submitting your article. If your manuscript was mask reviewed, please ensure that the final version for production includes a byline and full author note for typesetting.

APA Ethical Principles state that authors should "take responsibility and credit, including authorship credit, only for work they have actually performed or to which they have substantially contributed" and that authorship should "accurately reflect the relative scientific or professional contributions of the individuals involved" (Standard 8.12). Each submitted manuscript must include a paragraph (not included in the word count), after the body of the main text and before any acknowledgments, that states each author's contribution.

Double-space all copy. Other formatting instructions, as well as instructions on preparing tables, figures, references, metrics, and abstracts, appear in the Manual. Additional guidance on APA Style is available on the APA Style website.

Below are additional instructions regarding the preparation of display equations, computer code, and tables.

Display equations

We strongly encourage you to use MathType (third-party software) or Equation Editor 3.0 (built into pre-2007 versions of Word) to construct your equations, rather than the equation support that is built into Word 2007 and Word 2010. Equations composed with the built-in Word 2007/Word 2010 equation support are converted to low-resolution graphics when they

enter the production process and must be rekeyed by the typesetter, which may introduce errors.

To construct your equations with MathType or Equation Editor 3.0:

- Go to the Text section of the Insert tab and select Object.
- Select MathType or Equation Editor 3.0 in the drop-down menu.

If you have an equation that has already been produced using Microsoft Word 2007 or 2010 and you have access to the full version of MathType 6.5 or later, you can convert this equation to MathType by clicking on MathType Insert Equation. Copy the equation from Microsoft Word and paste it into the MathType box. Verify that your equation is correct, click File, and then click Update. Your equation has now been inserted into your Word file as a MathType Equation.

Use Equation Editor 3.0 or MathType only for equations or for formulas that cannot be produced as Word text using the Times or Symbol font.

Computer code

Because altering computer code in any way (e.g., indents, line spacing, line breaks, page breaks) during the typesetting process could alter its meaning, we treat computer code differently from the rest of your article in our production process. To that end, we request separate files for computer code.

In online supplemental material

We request that runnable source code be included as supplemental material to the article. For more information, visit Supplementing Your Article With Online Material.

In the text of the article

If you would like to include code in the text of your published manuscript, please submit a separate file with your code exactly as you want it to appear, using Courier New font with a type size of 8 points. We will make an image of each segment of code in your article that exceeds 40 characters in length. (Shorter snippets of code that appear in text will be typeset in Courier New and run in with the rest of the text.) If an appendix contains a mix of code and explanatory text, please submit a file that contains the entire appendix, with the code keyed in 8-point Courier New.

Tables

Use Word's insert table function when you create tables. Using spaces or tabs in your table will create problems when the table is typeset and may result in errors.

Appendix E: Interview Questions

1. How did you hear about the anti-racism training?
2. Can you talk me through your thoughts and feelings when you received the email/heard about it?
3. What did you make of the training at the time?
    a. Prompt: thoughts/feelings
4. What were your thoughts and feelings after the training?
5. Was there anything you found helpful?
    a. Prompt: thoughts about teachings/exercises/location/people/trainer
6. Was there anything you found unhelpful?
    a. Prompt: thoughts about teachings/exercises/location/people/trainer

7. Were there any ideas that were difficult?
    a. Prompt: Were there any ideas you found difficult to understand/accept/come to terms with?
    b. What made them difficult?

8. As a result of the training, has anything changed for you in your professional/personal or otherwise life?

9. Has the training influenced what you do at work or how you do your work?

10. Has the training influenced your thoughts/feelings/behaviour
    a. In relation to diversity within the profession
        i. In what way?
    b. In relation to diversity in recruitment?
        i. In what way?
    c. In relation to support for diverse trainees?
        i. In what way?

11. Has it had any impact on your relationships/or in the way you approach/see them?
    a. In what areas? (prompt: work/personal/clients)

12. If you feel you have learned anything - do you feel you have had the opportunity to apply what you have learned?
    a. Has anything facilitated you in applying what you have learned? (staff/personal qualities/trainees/external factors)

13. If you have tried to apply what you have learnt from the training, have there any been any barriers or challenges you have encountered?
    a. Prompt: work/personal/clients/other staff/trainees/external factors

14. Do you plan to continue your learning/growth in this area? If so, how?
15. Are there any behaviours you plan to change/continue to work on changing?

16. Do you have any thoughts/feelings about the global movement of making systems/structures anti-racist?

17. Do you have any thoughts/feelings about the movement of making Clinical Psychology anti-racist?

18. How do you feel the training could be improved?
19. How you could be better supported in what happens next
20. Have u attended anti-racism training in the past? How did this compare?
21. Any other comments/thoughts on the training

Appendix F: Information Sheet

Evaluating Anti-Racism Training at The Oxford Institute of Clinical Psychology Training and Research

General Information

We are inviting all course staff members who have attended anti-racism training at The Oxford Institute of Clinical Psychology Training and Research (OxICPT-R) to take part in a 1-1 interview).

Before you make a decision about participation, it is important for you to understand why the research is being done and what it will involve. If you have any questions or wish to talk about the project before deciding the take part, please contact the principal researcher.

The principal researcher is Eyrsa Yasin, trainee Clinical Psychologist at the OxICPT-R. This research is being undertaken under the supervision of Dr Ciorsdan Anderson.

We will ask you to take part in an online interview via Microsoft Teams (MSTeams) which may last up to 1 hour. You will be provided with potential date and time slots to choose from.

You will be asked to answer some demographic questions (age range, gender, ethnicity) which may serve to contextualise the information you choose to provide at interview. In the interview, you will be asked about your experience and opinion of the anti-racism training. This will include your personal views of before, during and after the training.

Why is this research being conducted?

In recognition of the inequalities faced by People from the Global Majority (PoGM) in entering into and working within the field of Clinical Psychology, Health Education England (HEE) offered funding to UK training courses to provide Anti-racism training. As such, The OxICPT-R initiated an anti-racism training programme, ran by external consultants for course staff. This project aims to evaluate the impact of the training and provide recommendations for improvement.

Do I have to take part?

You do not have to take part in this research, participation is voluntary. Should you decide to take part but later change your mind, you may withdraw at any stage. This includes terminating the interview or withdrawing your data after data collection. If you do decide to take part but do not wish to answer all of the questions, you may decide to decline any or all of the questions.

How will my data be used?

Interviews will be recorded via MSTeams platform and stored as an electronic file on the principal researchers' password-protected University of Oxford Microsoft OneDrive. The videos will be transcribed by the principal researcher and stored in the same manner. Data will be processed in accordance with the General Data Protection Regulation 2018 (GDRP). The data you provide will be anonymised and may be disseminated in various ways such as use in academic publications, conference presentations and/or reports. Although direct quotes may be used, no identifiable data will be associated.

Research data will be stored as detailed for five years after publication of the research.

Who will have access to my data?

The principal researcher will have access to all data. The project supervisor will have access to the anonymised transcripts. Please note, this research is being completed the principal researcher as partial fulfilment of the Doctorate in Clinical Psychology at the University of Oxford. As such, it will be written up and submitted for publication to a scientific peer reviewed journal and a copy will be stored in Oxford University archives.

Who has reviewed this research?

This research was proposed to the OxICPT-R Project Approval Session (PAS) panel and considered appropriate to investigate. Subsequently, the project has received ethical approval from the Oxford Health NHS Foundation Trust Audit Management and Tracking (AMaT) team.

Who do I contact if I have a concern about the research or I wish to complain?

Please contact Eyrsa Yasin (eyrsa.yasin@gtc.ox.ac.uk) or the project supervisor Ciorsdan Anderson (ciorsdan.anderson@hmc.ox.ac.uk) should you have any questions or concerns about the project. We will aim to acknowledge your concern within 10 working days.

Thank you for reading this information sheet and for considering taking part in this research.

Appendix G: Consent Form

Oxford Institute of Clinical Psychology Training & Research
Oxford Doctoral Programme in Clinical Psychology
Service Improvement Project

RECORD OF CONSENT FOR PARTICIPATION

Trainee Name:	
Supervisor Name:	
Date of Recording:	

I have had explained to me the purpose of the project and have had opportunity to have my questions answered.

I agree to a recording being made and for it to be transcribed, with an anonymised transcript being used to inform the service improvement project. Direct quotes may be included in the write up, with identifiable information removed.

I understand that the recording will be kept in a secure place and encrypted format and deleted as soon as it has been used for the purpose it is being made.

I agree to the project being written up and published. No identifiable information will be included in this.

I understand that I can withdraw my consent to the above at any time and that this will not affect the service I receive.

Signed:	
Print name:	
Date:	

Appendix H: Position Statement

This project required me to reflect on my position in relation to the research topic and the context in which the data were generated. As a trainee clinical psychologist from an ethnic minority background, anti-racism within the profession is not a neutral topic for me. My experiences of training thus far have shaped my awareness of how racism can operate subtly at system levels, and also through expectations and power structures; these reflections accompanied me throughout data analysis, in particular.

During data collection and the analysis process, I noticed moments where participants' accounts resonated with my own experiences of training and supervision, particularly in relation to barriers and the emotional labour involved in addressing racism within professional structures where power is unevenly distributed. At these points, I was aware of a pull towards agreement and had to work to remain neutral. Reflexive journaling encouraged me to slow the analytic process and examine whether interpretations were grounded in the data or influenced by my positionality, helping me remain attentive to the experiences shared by participants, including uncertainty and constraint within accounts.

I was also mindful of the broader political context surrounding anti-racism in the UK at the time of data collection. Ongoing public and institutional debate appeared to shape how participants framed their accounts, often cautiously emphasising organisational limitations or distancing responsibility for change. I reflected on my own emotional responses to these narratives, particularly frustration or disappointment, and considered how these reactions related to my perspective rather than the analysis.

Analysing data from staff members prompted reflection on power and hierarchy; as a trainee, I was hyper-aware of the risk of over-idealising or over-critiquing participants' accounts. Reflexive engagement supported awareness of discomfort, deference, or scepticism and how professional hierarchy intersected with race and seniority in the analytic process.

Overall, I aimed to hold a balanced position that acknowledged both the structural constraints described by participants and the subsequent implications for trainees from ethnic minority backgrounds, whilst presenting the data with fidelity and analytic integrity.

Theoretically Driven Research Project

Appendix I: Author Guidelines

Journal: Disability and Rehabilitation

1. **Author details**. Please ensure everyone meeting the International Committee of Medical Journal Editors (ICJME) requirements for authorship is included as an author of your paper. Please ensure all listed authors meet the Taylor & Francis authorship criteria. All authors of a manuscript should include their full name and affiliation on the cover page of the manuscript. Where available, please also include ORCiDs and social media handles (Facebook, Twitter or LinkedIn). One author will need to be identified as the corresponding author, with their email address normally displayed in the article PDF (depending on the journal) and the online article. Authors' affiliations are the affiliations where the research was conducted. If any of the named co-authors moves affiliation during the peer-review process, the new affiliation can be given as a footnote. Please note that no changes to affiliation can be made after your paper is accepted. Read more on authorship.
2. **CRediT Roles.** From February 2025, this journal collects CRediT roles as part of the submission process and includes them on published articles when supplied by the authors. You may be required to provide CRediT roles (contributor details) for yourself and your co-authors. For more information about CRediT visit Author Services.
3. A structured **abstract** of no more than 200 words. A structured abstract should cover (in the following order): the *purpose* of the article, its *materials and methods* (the design and methodological procedures used), the *results* and conclusions (including their relevance to the study of disability and rehabilitation). Read tips on writing your abstract.

4. **Graphical abstract** (optional). This is an image to give readers a clear idea of the content of your article. It should be a maximum width of 525 pixels. If your image is narrower than 525 pixels, please place it on a white background 525 pixels wide to ensure the dimensions are maintained. Save the graphical abstract as a .jpg, .png, or .gif. Please do not embed it in the manuscript file but save it as a separate file, labelled GraphicalAbstract1.Taylor & Francis Editing Services provides a graphical abstract creation service for a fee.
5. You can opt to include a **video abstract** with your article. Find out how these can help your work reach a wider audience, and what to think about when filming. Taylor & Francis Editing Services provides a video abstract creation service for a fee.
6. 5-8 **keywords**. Read making your article more discoverable, including information on choosing a title and search engine optimization.
7. A feature of this journal is a boxed insert on **Implications for Rehabilitation**. This should include between two to four main bullet points drawing out the implications for rehabilitation for your paper. This should be uploaded as a separate document. Below are examples:

   Example 1: Leprosy

   - Leprosy is a disabling disease which not only impacts physically but restricts quality of life often through stigmatisation.
   - Reconstructive surgery is a technique available to this group.
   - In a relatively small sample this study shows participation and social functioning improved after surgery.

   Example 2: Multiple Sclerosis

- Exercise is an effective means of improving health and well-being experienced by people with multiple sclerosis (MS).
- People with MS have complex reasons for choosing to exercise or not.
- Individual structured programmes are most likely to be successful in encouraging exercise in this cohort.

8. **Acknowledgement**. Please supply all details required by your funding and grant-awarding bodies as follows: *For single agency grants*: This work was supported by the under Grant . *For multiple agency grants*: This work was supported by the under Grant ; under Grant ; and under Grant .
9. **Declaration of Interest**. This is to acknowledge any financial or non-financial interest that has arisen from the direct applications of your research. If there are no relevant competing interests to declare please state this within the article, for example: *The authors report there are no competing interests to declare.* Further guidance on what is a conflict of interest and how to disclose it.
10. **Data availability statement.** If there is a data set associated with the paper, please provide information about where the data supporting the results or analyses presented in the paper can be found. Where applicable, this should include the hyperlink, DOI or other persistent identifier associated with the data set(s). Templates are also available to support authors.
11. **Data deposition.** If you choose to share or make the data underlying the study open, please deposit your data in a recognized data repository prior to or at the time of submission. You will be asked to provide the DOI, pre-reserved DOI, or other persistent identifier for the data set.
12. **Supplemental online material.** Supplemental material can be a video, fileset, audio file or anything which supports (and is pertinent to) your paper. Articles with

extenders, such as infographics or video summaries, are up to 108% more likely to be downloaded (based on data in May 2024 fromPlain Language Summary of Publication and Clinical Trial Protocol articles published in Future Oncology in 2023). We publish supplemental material online via Figshare. Find out more about supplemental material and how to submit it with your article. Taylor & Francis Editing Services can help you create research promotion materials, including infographics, video abstracts, lay summaries and graphical abstracts, to support your article's impact. For more information, including pricing, visit this website.

13. **Figures.** Figures should be high quality (1200 dpi for line art, 600 dpi for grayscale and 300 dpi for colour, at the correct size). Figures should be supplied in one of our preferred file formats: PS, JPEG, TIFF, or Microsoft Word (DOC or DOCX) files are acceptable for figures that have been drawn in Word. For information relating to other file types, please consult our Submission of electronic artwork.
14. **Tables.** Tables should present new information rather than duplicating what is in the text. Readers should be able to interpret the table without reference to the text. Please supply editable files.
15. **Equations**. If you are submitting your manuscript as a Word document, please ensure that equations are editable. More information about mathematical symbols and equations.
16. **Units.** Please use SI units (non-italicized).

Appendix J: Information Sheet

An Investigation of Wellbeing in Carers of Stroke Survivors

PARTICIPANT INFORMATION SHEET

Central University Research Ethics Committee Approval Reference: R93569/RE001

Introductory paragraph

You are being invited to take part in a research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part.

Why is this research being conducted?

After someone has had a stroke, often someone close to them adopts the role of being an informal carer. This role is important to support the stroke survivor's rehabilitation, including their independence in the community and their mental wellbeing. We therefore want to find out how to better support carers so that they can continue in their valuable roles successfully. We have drawn on the research in other caring populations and are interested in whether belonging to groups impacts wellbeing of carers of stroke survivors.

Why have I been invited to take part?

Stroke survivor:

You have been invited to take part because you had a stroke and were previously recruited for research with us, involving a 6-month follow up visit.

Carer:

You have been invited because you are an informal carer for someone who has had a stroke. As far as we are aware, the person you care for was previously recruited for research with us.

Everyone who takes part must be 18 years or above, have been a carer for the stroke survivor for at least 6 months, and have a sufficient understanding of English to understand study procedures and complete questionnaires.

Do I have to take part?

No. You can ask questions about the research before deciding whether or not to participate. If you do agree to participate, you may withdraw yourself from the study at any time before the research team finishes collecting data, without giving a reason, by advising the researchers of this decision.

What will happen to me if I take part in the research?

Stroke survivor:

If you are happy to take part, you will be asked to provide consent for your information about your stroke to be linked to your carers data. This information will then be accessed via records you have already provided to the research team and will include details about the type of stroke you had and the associated cognitive impact.

Carer:

If you are happy to take part in the research, you will be asked to complete three questionnaires about your wellbeing and group membership during either an online video call, a phone call appointment, or an in-person appointment depending on your preference. We can provide instructions on how to use the video call if this is your preferred option. The session will last approximately 30 minutes.

At the start of the session, we will explain all study procedures again and give you the opportunity to ask us any questions. If you are happy to proceed, you will be asked to complete a consent form. Next, you will be asked to answer questions on three questionnaires. The researcher will go through these with you. At the end of the appointment you will be given another opportunity to ask any questions you may have.

What are the possible disadvantages and risks in taking part?

Taking part will take approximately 45 minutes of your time in total. Some of the questionnaire measures invite you to think about the impact of caring for the stroke survivor and your psychological wellbeing which may be difficult to think about. We have consulted with people who have had a stroke and with lived experience of caring for stroke survivors to minimise the potential for distress. However, it is possible you might find answering the questions upsetting. You can either take a break from the study and return to it later or withdraw from the study. At the end of the study, or if you withdraw at any point during completion, you will provided with contact details of services and third-party organisations that will be able to offer support and guidance if you experience distress. It should be noted that if at any point you share information with us that leads us to believe you are at risk of harm to yourself or others, we have a duty of care to share this information with your primary care provider and take necessary steps to keep yourself and others safe.

Are there any benefits in taking part?

We hope that your participation in this study will help us understand how belonging to groups whilst caring for someone who has had a stroke might impact wellbeing. We hope that this information will inform how we can better support carers. However, there are no direct benefits to those participating.

What information will be collected and why is the collection of this information relevant for achieving the research objectives?

The information you provide as part of the study is research data. Any research data from which you can be identified (e.g., your name, your address), is known as personal data.

The research data will be stored confidentially. All results on the questionnaires that you will complete will be pseudonymised with a code. Other than the consent form, your name will not be written on the forms that the researcher completes. This means that the results cannot be linked back to you by a person outside of the research group. These pseudonymised research data will be stored on password protected computers. Paper data will be scanned into the computer upon receipt and subsequently destroyed. Identifiable personal data is included in your electronic consent form (name) and on the electronic linkage list (name and contact information). The electronic forms and list will be password protected and stored, separate from the research data, on password protected computers. All research data (including consent forms) will be stored for 3 years after publication or public release of the work of the research.

Sometimes, new methods to analyse data become available after a study has ended. Therefore, we will use your data in future studies, and share data from this study, with other researchers both inside and outside the UK and the European Union. There will not be any identifiable data in the information that is shared with other researchers or in the results that are made public.

You have been invited to participate in the present research, as you previously agreed for your contact details to be stored for the purposes of research. Should you wish to have your contact details removed from this database, please do let the research team know using the contact details listed on the bottom of this form.

Although every reasonable effort will be taken (e.g. only using approved software), confidentiality during online appointments cannot be guaranteed.

Responsible members of the University of Oxford may be given access to data for monitoring and/or audit of the study to ensure we are complying with guidelines.

Will the research be published? Could I be identified from any publications or other research outputs?

This project is being undertaken to fulfil requirements for a Doctorate in Clinical Psychology qualification, as such we plan to disseminate our findings through conference presentations and journal articles. At the end of the project, the anonymised data will be available in an open science archive for the benefit of society. We will also publish a lay summary of our research on our website and distribute it through our funders.

Data Protection

The University of Oxford is the data controller with respect to your personal data, and as such will determine how your personal data is used in the research. The University will process your personal data for the purpose of the research outlined above. Research is a task that is performed in the public interest. Further information about your rights with respect to your personal data is available from the University's Information Compliance website at https://compliance.admin.ox.ac.uk/individual-rights.

Who is organising and funding the research?

The research is organised and funded by the University of Oxford Institute of Clinical Psychology Training and Research in collaboration with Associate Professor Nele Demeyere at the Department of Experimental Psychology.

Who has reviewed this study?

This research ethics approval from a subcommittee of the University of Oxford Central University Research Ethics Committee (Ethics reference: R93569/RE001).

Who do I contact if I have a concern about the study or wish to complain?

If you have a concern about any aspect of this study, please speak to Jana Ihnen (jana.ihnen@hmc.ox.ac.uk), who will do her best to answer your query. We will acknowledge your concern within 10 working days and give you an indication of how it will be dealt with. If you remain unhappy or wish to make a formal complaint, please contact the University of Oxford Research Governance, Ethics & Assurance (RGEA) team at rgea.complaints@admin.ox.ac.uk or on 01865 616480.

Further Information and Contact Details

If you would like to discuss this research with someone beforehand (or if you have questions afterwards) please contact:

Eyrsa Yasin: eyrsa.yasin@gtc.ox.ac.uk

Professor Nele Demeyere: nele.demeyere@psy.ox.ac.uk

Dr Reena Vohora: reena.vohora@hmc.ox.ac.uk

Thank you for taking the time to read this information sheet and your interest in the project!

Appendix K: Participant Consent Form

Principle Investigator: Professor Nele Demeyere;
nele.demeyere@psy.ox.ac.uk
Primary researcher: Eyrsa Yasin, Trainee Clinical Psychologist,
eyrsa.yasin@gtc.ox.ac.uk

UNIVERSITY OF OXFORD

PARTICIPANT CONSENT FORM

CUREC Approval Reference: R93569/RE001

An Investigation of Wellbeing in Carers of Stroke Survivors

		Please initial each box
1	I confirm that I have read and understand the information sheet version 1.0 dated 03.08.2024 for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without penalty.	☐
3	I understand that research data collected during the study may be looked at by designated individuals from the University of Oxford where it is relevant to my taking part in this study. I give permission for these individuals to have access to this data.	☐
4	I understand who will have access to personal data provided, how the data will be stored and what will happen to the data at the end of the project.	☐
5	I understand that all information will be kept strictly confidential except in rare circumstances in which it is judged that I am, or someone else is, at immediate risk of serious harm, or where information is requested by a court of law.	☐
6	I (the carer) consent to my data being linked to the data of the person I am caring for.	☐
7	I (the stroke survivor) consent to my data being linked to the carers data.	☐
8	I understand how to raise a concern or make a complaint.	☐
9	I agree to take part in the above study.	☐
Optional	I agree that my contact details can be retained in a secure database so that the researchers can contact me about future studies.	YES/ NO

_____	dd / mm / yyyy	_____	
Name of Participant (Carer)	Date	Signature	
_____	dd / mm / yyyy	_____	
Name of Participant (stroke survivor)	Date	Signature	
_____	dd / mm / yyyy	_____	
Name of person taking consent	Date	Signature	

Appendix L: Carers Resources

Central University Research Ethics Committee Approval Reference: R93569/RE001

An Investigation of Wellbeing in Carers of Stroke Survivors

Thank you for taking part in our research study. We have compiled a list of resources that may be of benefit if you wish to seek support for your mental health or would like some social support in your caring role.

If you are experiencing low mood or other emotional difficulties and would like some help, below are a list of resources that may be useful.

1. Make an appointment with your GP. Your doctor can provide information about psychological therapies and/or medication and refer you to an NHS Psychologist or Psychiatrist if needed. To do this, you may need to ask your doctor specifically for a referral through "IAPT" (Improving Access to Psychological Treatments) or "Talking Therapies".

Or you may wish to self-refer at https://www.oxfordhealth.nhs.uk/oxon-talking-therapies/ or call **01865 901 222**

2. The NHS also have freely accessible mental health support which can be found at:

Every Mind Matters

https://www.nhs.uk/every-mind-matters/mental-health-issues/

Talking Therapies and Counselling

https://www.nhs.uk/mental-health/talking-therapies-medicine-treatments/talking-therapies-and-counselling/self-help-therapies/

There are websites that have freely accessible support specifically for carers. These include:

1. Carers UK

https://www.carersuk.org/help-and-advice/your-health-and-wellbeing/

Carers UK are an online resource offering guidance and online carer meetups which can be accessed at: https://www.carersuk.org/help-and-advice/your-health-and-wellbeing/online-meetups/

2. Mind

https://www.mind.org.uk/information-support/helping-someone-else/carers-friends-family-coping-support/support-for-you/#:~:text=Local%20support%20services.,the%20Family%20Lives%20local%20services

3. Carers Hub

https://www.carershub.org.uk/post/carers-wellbeing

4. NHS Life After Stroke Family and Carer Support Service

https://www.nhs.uk/services/service-directory/life-after-stroke-family-and-carer-support-service/N10959759

0303 3033 100

5. Stroke Association

https://www.stroke.org.uk/stroke/support/caring-for-a-stroke-survivor

If you are very distressed and concerned that you may harm yourself, please call:

England: 111 and select **Option 2** to reach the NHS First Response Service, a mental health crisis team. Ther service can send someone to see you, or arrange emergency services.

Wales: 111 or **0845 4647** (NHS Direct Wales) or 0800 132 737 (Community Advice and Listening Line)

Scotland: NHS 24 (**111**) or 0800 838587 (Breathing Space Scotland, Mon to Thurs 6pm to 2am, Fri to Mon 6pm - 6am) or NHS Living Life Telephone Support (0800 328 9655)

Northern Ireland: **111** (NHS) or Lifeline: 0808 808 8000 (24 hour crisis response line)

You can always additionally ring 999 for emergency services.

You can always additionally call **999** for emergency services.

Appendix M: Psychological Wellbeing Index (PWBI)

1. How have you been feeling in general during the past month?

In excellent spirits……	☐ 5
In very good spirits……..	☐ 4
In good spirits mostly……..	☐ 3
I have been up and down in spirits a lot……..	☐ 2
In low spirits mostly……	☐ 1
In very low spirits……	☐ 0

2. How often were you bothered by any illness, bodily disorder, aches or pains during the past month?

Every day……	☐ 0
Almost every day……	☐ 1
About half of the time…….	☐ 2
Now and then, but less than half the time……...	☐ 3
Rarely……..	☐ 4
None of the time……..	☐ 5

3. Did you feel depressed during the past month?

Yes – to the point that I felt like taking my life……..	☐ 0
Yes – to the point that I did not care about anything……..	☐ 1
Yes – very depressed almost every day……..	☐ 2
Yes – quite depressed several times……..……....	☐ 3
Yes – a little depressed now and then…….	☐ 4
No – never felt depressed at all……	☐ 5

4. Have you been in firm control of your behaviour, thoughts, emotions or feelings during the past month?

Yes, definitely so……	☐ 5
Yes, for the most part…….	☐ 4
Generally so……	☐ 3
Not too well……..……...	☐ 2
No, and I am somewhat disturbed……..	☐ 1
No, and I am very disturbed……	☐ 0

5. Have you been bothered by nervousness or your "nerves" during the past month?

Extremely so – to the point where I could not work or take care of things……	☐ 0
Very much so……..	☐ 1
Quite a bit……	☐ 2
Some – enough to bother me……..…….	☐ 3
A little…….	☐ 4
Not at all……..	☐ 5

6. How much energy, pep, or vitality did you have or feel during the past month?

Very full of energy – lots of pep……. ☐ 5
Fairly energetic most of the time……..… ☐ 4

My energy level varied quite a bit……... ☐ 3
Generally low in energy or pep…….…….…. ☐ 2
Very low in energy or pep most of the time…… ☐ 1
No energy or pep at all – I fell drained, sapped……... ☐ 0

7. I felt downhearted and blue during the past month.

None of this time…… ☐ 5
A little of the time…….…….. ☐ 4

Some of the time…….…… ☐ 3
A good bit of the time…….…….…... ☐ 2
Most of the time…….. ☐ 1
All of the time…….…… ☐ 0

8. Were you generally tense or did you feel any tension during the past month?

Yes – extremely tens, most or all of the time……. ☐ 0
Yes – very tense most of the time…….. ☐ 1

Not generally tense, but did feel fairly tense several times…….. ☐ 2
I felt a little tense a few times…….…… ☐ 3
My general tension level was quite low……. ☐ 4
I never felt tense or any tension at all…….. ☐ 5

9. How happy, satisfied, or pleased have you been with your personal life during the past month?

Extremely happy – could not have been more satisfied or pleased…… ☐ 5
Very happy most of the time…….. ☐ 4

Generally satisfied, pleased…….…… ☐ 3
Sometimes fairly happy, sometimes fairly unhappy…….. ☐ 2
Generally dissatisfied or unhappy…….……. ☐ 1
Very dissatisfied or unhappy most or all the time…….. ☐ 0

10. Did you feel healthy enough to carry out the things you like to do or had to do during the past month?

Yes – definitely so……...…… ☐ 5
For the most part……..…….…….. ☐ 4

Health problems limited me in some important ways…… ☐ 3
I was only healthy enough to take care of myself …….. ☐ 2
I needed some help in taking care of myself.……. ☐ 1
I needed someone to help me with most or all of the things I had to do..…….. ☐ 0

11. Have you felt so sad, discouraged, hopeless, or had so many problems

that you wondered if anything was worthwhile during the past month?

Extremely so – to the point that I have just about given up..…….…… ☐ 0
Very much so…..……..…….…….. ☐ 1

Quite a bit…… ☐ 2
Some – enough to bother me…….. ☐ 3
A little bit……..……..……. ☐ 4
Not at all……....…….. ☐ 5

12. I woke up feeling fresh and rested during the past month.

None of the time……....……..…… ☐ 0
A little of the time..……..…….…….. ☐ 1

Some of the time..…… ☐ 2
A good bit of the time…….. ☐ 3
Most of the time…...……..…….……. ☐ 4
All of the time……....…….. ☐ 5

13. Have you been concerned, worried, or had any fears about your health during the past month?

Extremely so…..……....……..…… ☐ 0
Very much so……..……..…….……. ☐ 1

Quite a bit……...…… ☐ 2
Some, but not a lot…..…… ☐ 3
Practically never.....……..…….……. ☐ 4
Not at all……....…….. ☐ 5

14. Have you had any reason to wonder if you were losing your mind, or losing control over the way you act, talk, think, feel or of your memory during the past month?

Not at all…..……....……..……. ☐ 5
Only a little……..……..…….…….... ☐ 4

Some – but not enough to be concerned or worried about……. ☐ 3
Some and I have been a little concerned…… ☐ 2
Some and I am quite concerned..……..…….……. ☐ 1
Yes, very much so and I am very concerned……....…….. ☐ 0

15. My daily life was full of things that were interesting to me during the past month.

None of the time……....……..……... ☐ 0
A little of the time……..…….……..... ☐ 1

Some of the time……. ☐ 2
A good bit of the time…….…… ☐ 3
Most of the time……..……..…….……. ☐ 4
All of the time……....……. ☐ 5

16. Did you feel active, vigorous, or dull, sluggish during the past month?

Very active, vigorous every day……..……...……..……. ☐ 5
Mostly active, vigorous – never really dull, sluggish…….……..... ☐ 4

Fairly active, vigorous – seldom dull, sluggish…….……. ☐ 3
Fairly dull, sluggish – seldom active, vigorous..…… ☐ 2
Most dull, sluggish – never really active, vigorous...……. ☐ 1
Very dull, sluggish every day……...……. ☐ 0

17. Have you been anxious, worried, or upset during the past month?

Extremely so – to the point of being sick or almost sick……..…….. ☐ 0
Very much so…...……..…….…….... ☐ 1

Quite a bit……...……. ☐ 2
Some – enough to bother me..…….…… ☐ 3
A little bit……..……..……..……. ☐ 4
Not at all…….……...……. ☐ 5

18. I was emotionally stable and sure of myself during the past month.

None of the time……...……..……... ☐ 0
A little of the time……..…….…….... ☐ 1

Some of the time……. ☐ 2
A good bit of the time…….…… ☐ 3
Most of the time……..……..……. ☐ 4
All of the time……...……. ☐ 5

19. Did you feel relaxed, at ease or high strung, tight, or keyed-up during the past month?

Felt relaxed and at ease the whole month……..…….. ☐ 5
Felt relaxed and at ease most of the time…….…….... ☐ 4

Generally felt relaxed but at times felt fairly high strung...……. ☐ 3
Generally felt high strung but at times felt fairly relaxed…… ☐ 2
Felt high strung, tight, or keyed-up most of the time..……. ☐ 1
Felt high strung, tight, or keyed-up the whole month..……...……. ☐ 0

20. I felt cheerful, lighthearted during the past month.

None of the time……...……..……... ☐ 0
A little of the time……..…….…….... ☐ 1

Some of the time……. ☐ 2
A good bit of the time…….…… ☐ 3
Most of the time……..……..……. ☐ 4
All of the time……...……. ☐ 5

21. I felt tired, worn out, used up, or exhausted during the past month.

None of the time……...……..……... ☐ 5

A little of the time……..…….…….... ☐ 4

Some of the time……. ☐ 3
A good bit of the time…….…… ☐ 2
Most of the time……..……..…….……. ☐ 1
All of the time…….....……. ☐ 0

22. Have you been under or felt you were under any strain, stress, or pressure during the past month?

Yes – almost more than I could bear or stand……..…….. ☐ 0
Yes – quite a bit of pressure……..…….…….... ☐ 1

Yes, some – more than usual…….....……. ☐ 2
Yes, some – but about usual……... ☐ 3
Yes – a little……...……. ☐ 4
Not at all…….……....……. ☐

Appendix N: Modified Caregiver Strain Index (MCSI)

Directions: Here is a list of things that other caregivers have found to be difficult. Please put a checkmark in the columns that apply to you. We have included some examples that are common caregiver experiences to help you think about each item. Your situation may be slightly different, but the item could still apply.

	Yes, On a Regular Basis=2	Yes, Sometimes =1	No=0
My sleep is disturbed (For example: the person I care for is in and out of bed or wanders around at night)	_____	_____	_____
Caregiving is inconvenient (For example: helping takes so much time or it's a long drive over to help)	_____	_____	_____
Caregiving is a physical strain (For example: lifting in or out of a chair; effort or concentration is required)	_____	_____	_____
Caregiving is confining (For example: helping restricts free time or I cannot go visiting)	_____	_____	_____
There have been family adjustments (For example: helping has disrupted my routine; there is no privacy)	_____	_____	_____
There have been changes in personal plans (For example: I had to turn down a job; I could not go on vacation)	_____	_____	_____
There have been other demands on my time (For example: other family members need me)	_____	_____	_____
There have been emotional adjustments (For example: severe arguments about caregiving)	_____	_____	_____
Some behavior is upsetting (For example: incontinence; the person cared for has trouble remembering things; or the person I care for accuses people of taking things)	_____	_____	_____
It is upsetting to find the person I care for has changed so much from his/her former self	_____	_____	_____

(For example: he/she is a different person than he/she used to be)

There have been work adjustments _____ _____ _____
(For example: I have to take time off for caregiving duties)

Caregiving is a financial strain _____ _____ _____

I feel completely overwhelmed _____ _____ _____
(For example: I worry about the person I care for; I have concerns about how I will manage)

[Sum responses for "Yes, on a regular basis" (2 pts each) and "yes, sometimes" (1 pt each)]

Total Score =

Thornton, M., & Travis, S.S. (2003). Analysis of the reliability of the Modified Caregiver Strain Index. The Journal of Gerontology, Series B, Psychological Sciences and Social Sciences, 58(2), p. S129. Copyright © The Gerontological Society of America. Reproduced by permission of the publisher.

The Hartford Institute would like to acknowledge the original author of this Try This® issue: M. Terry Sullivan.

Appendix O: Exeter Identity Transitions Scales (EXITS)

The present study will adapt questions for suitability to stroke carers[1].

Multiple group memberships – Four items on the EXITS assess the number of groups participants identified with prior to the life changing event; (1) "before [life changing event] I belonged to lots of different groups", (2) "before [life changing event], I joined in the activities of lots of different groups", (3) "before [life changing event] I had friends who were members of lots of different groups", (4) "before [life changing event] I had strong ties with lots of different groups".

Maintenance of group membership – Four items aim to assess whether pre-stroke groups are maintained. These items include: (1) "after [life changing event], I still belong to the same groups I was a member of before [life changing event]" (2) "After [life changing event], I still join in the same group activities as before [life changing event]" (3) "After [life changing event], I am friends with people in the same groups as I was before [life changing event]" (4) "After [life changing event], I continue to have strong ties with the same groups as before [life changing event]" (Bevins, 2008).

New group memberships – Four items assess whether participants became members of new groups. Items are as follows: (1) "after [life changing event], I have joined one or more new groups", (2) "After [life changing event], I have joined the activities of new groups", (3) "After [life changing event], I am friends with people from one or more of these new groups", (4) "After [life changing event], I have strong ties with one or more new groups".

[1] Language of items will be amended to "the stroke".

Appendix P: Ethical Approval

MEDICAL SCIENCES INTERDIVISIONAL RESEARCH ETHICS COMMITTEE
Research Services, Boundary Brook House, Churchill Drive, Headington, Oxford, OX3 7GB
Tel: +44(0)1865 616575
ethics@medsci.ox.ac.uk

CONFIDENTIAL

Professor Nele Demeyere, Jana Ihnen & Eyrsa Yasin
Nuffield Department of Clinical Neurosciences
University of Oxford
John Radcliffe Hospital
Oxford

30 August 2024

Dear Professor Demeyere, Jana and Eyrsa,

Research Ethics Approval - CUREC 1

Ethics Approval Reference: R93569/RE001

Study titles:

- **Study 1: Psychological adjustment in stroke survivors – A moderation analysis of the impact of post-stroke cognitive impairment (PSCI) on the relationship between perceived control and psychological adjustment post-stroke**
- **Study 2: Social identity continuity in predicting wellbeing in carers of stroke survivors**

The above application has been considered on behalf of the Medical Sciences Interdivisional Research Ethics Committee (MS IDREC) in accordance with the University's procedures for ethical approval of all research involving human participants.

I am pleased to inform you that, on the basis of the information provided to the IDREC, the proposed research has been judged as meeting appropriate ethical standards, and approval has been granted from **30th August 2024 until 28th February 2026.**

Insurance-provided indemnity arrangements are in place for the duration of the approval stated above. It is your responsibility to ensure that you request an extension to the end date for indemnity to remain in place should you continue the research beyond the dates covered.

Amendments

Should there be any subsequent changes to the study, you should submit details to the MS IDREC for consideration and approval. Details of changes must be listed on an amendment form.

Yours Sincerely

DocuSigned by:
Leah Butts
9F1488902BC5494...

Mrs Leah Butts
Research Ethics Administrator

for
Dr Helen Barnby-Porritt
Research Ethics Manager