Doctoral Thesis

An Exploration of the Neuropsychological Needs of Individuals Experiencing Homelessness

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Abstract

**Background:** In recent decades research has reported high rates of cognitive difficulties in individuals experiencing homelessness. Thus far, these difficulties have been linked with higher instances of traumatic brain injuries (TBIs), substance misuse, and mental health (MH) issues in this group compared to the general population. In addition to existing structural and systemic barriers, cognitive difficulties can hinder a person’s exit from homelessness.

**Method:** A scoping literature review was conducted to investigate whether intellectual disability (ID) may contribute to level of cognitive difficulties observed in homelessness. An exploratory cross-sectional study was carried out to provide a profile of the neuropsychological issues in a small sample of individuals experiencing homelessness and their use of services. The methodology employed addressed key issues in the field of homelessness research.

**Results:** The review identified seven studies exploring homelessness and ID with the proportion of ID reported ranging from 5.6% to 39% across samples. The field study further supported the accrual of multiple vulnerabilities in homelessness including cognitive impairment and TBI. Participants had high attendance at acute services, namely Accident & Emergency (A&E), while specialist MH and brain injury services were rarely if ever used. The methodology employed was tolerated well by participants and provides a template for future research which can be further developed.

**Conclusions:** This thesis highlights the cognitive impairment in homelessness. Further research, building on the methodology employed in this study, can investigate how the different issues identified (e.g. TBI and MH difficulties) relate to the cognitive impairment observed and how best to support them.
Declaration

I declare that this thesis, which is submitted in fulfilment of the Doctorate in Clinical Psychology at Lancaster University, was compiled by myself. The work contained herein is my own except where explicitly stated otherwise in the text and it has not been presented for the award of a degree elsewhere.

Signature:

Date: 12th July 2018
Acknowledgement

Many hands contributed to the journey this thesis has brought me on. The greatest debt that I’ll never repay are to my parents, Mark and Dolores, for the love and care with which they prepared me for the world (and continue to do so). My siblings, you weird and wonderful bunch, you are always a part of me. I am particularly grateful to Ronald, whose patience knows (few) limits, thank you for being a very understanding housemate, I’ll have no excuse to do the dishes now!

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Chapter 1 Literature review

Title: Intellectual Disabilities and Homelessness:

A Systematic Scoping Review of the Evidence

Short Title: Homelessness & Intellectual Disability

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Word count: 7307 (Excluding title page, references, tables, figures and appendices)

Target Journal: Journal of Intellectual Disability Research (see Chapter 5, Appendix A for notes to contributors)

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Abstract

**Background:** A growing body of research indicates cognitive impairment is common in those experiencing homelessness and can negatively impact the potential for a person’s circumstances to improve. Similarly, research suggests that individuals with an intellectual disability (ID) experience more risk factors for poverty than those without. As cognitive impairment is a key criterion for ID, there may be potential for those with an ID to also experience homelessness.

**Method:** A review of relevant databases was conducted to identify papers investigating ID in homelessness, the methods employed to do so, their robustness, and key issues identified using these methods. The studies’ methodological strengths and reporting were assessed using the Newcastle-Ottawa Scale and the STROBE guidelines for reporting observational studies.

**Results:** Only seven studies exploring ID and homelessness met the eligibility criteria. The proportion of ID reported across samples ranged from 5.6% to 39%. A key methodological issue was the lack of a consistent approach for identifying ID. Only one study met the international ID assessment guidelines. Other issues affecting comparability included the wide geographic distribution of studies and the tendency for ID to be investigated as an addition to the main study.

**Conclusions:** This review highlighted the difficulties in identifying ID in the homelessness population and the need for consistency of approach. In the studies reviewed there were significant methodological issues limiting the generalisability of results. Future research would benefit from greater consideration of the criteria for the assessment of ID and the pragmatic application of these guidelines in the context of homelessness research.

**Keywords:** homelessness, poverty, inequality, intellectual disability, cognitive difficulties
Homelessness has been described as ‘the problem faced by people who lack a place to live that is supportive, affordable, decent, and secure’ (Crisis, 2016, p.1). It is an international issue that is difficult to quantify. The United Nations’ (UN) (2005) estimate that worldwide 100 million people are without a home and one billion are inadequately housed. This includes an estimated 1.4 million people in the US, 112,070 in England, and 78 million in India (Homeless World Cup Foundation, 2018). Since these estimates there has been a recession affecting economies across the world which was accompanied by an increase in homelessness in many countries. In the UK it was associated with the reversal of a decade’s long reduction in homelessness numbers (Loopstra et al., 2016). Unsheltered sleeping, the most visible sign of homelessness, has increased resulting in a 168% rise in just eight years (Ministry of Housing, Communities, & Local Government, 2018).

Cognitive Impairment in Homelessness

Cognitive abilities, including higher-order thinking processes or executive functions, attention, memory, and verbal ability (Fry, Langley, & Shelton, 2017) give rise to successful adaptation and academic performance (Sternberg, 2002). Difficulty with these skills can interfere with a person’s ability to access employment (Holthausen et al., 2007) and live independently (Burra, Stegioploulos, & Rourke, 2009; Cahn-Weiner et al., 2007). Masten and Coatsworth (1998) propose that cognitive skills may represent a vital set of abilities that distinguish those who adapt well, and use available resources effectively, from those who experience difficulties with these activities. As such, cognitive difficulties can represent a risk factor for homelessness and a barrier to exiting it (Buckner, 2008; Hurstak et al., 2017, Milburn et al., 2009,).

Research has indicated high levels of cognitive difficulties in those experiencing homelessness (Burra et al., 2009; Depp, Vella, Orff, & Twamley, 2015; Spence, Stevens, & Sparks,
A review of this research, based on 24 studies encompassing 2,969 participants reported a pooled estimate of 25% for the frequency of cognitive impairment (Depp et al., 2015). It also reported a mean full-scale IQ (intelligence quotient) of 85, one standard deviation below the norm, indicating cognitive functioning in the low-average category. The review noted that in studies which estimated premorbid IQ, the mean score was below average and close to the mean full-scale IQ. They suggest that this is indicative of possible premorbid / developmental issues in a proportion of the homeless population. The review highlighted that while the pathways to cognitive impairment in this population are diverse, potential risk factors such as ID have not been properly addressed (Depp et al., 2015).

It also reported that results were heavily influenced by methodological issues such as sample representativeness and the chosen measurement tool. For example, a study investigating cognitive functioning in participants staying in temporary accommodation in Scotland, reported that 82% of the sample met the cut-off point for likely impairment using Addenbrooke’s Cognitive Examination (ACE) (Gilchrist and Morrison, 2005; Mathuranath, Nestor, Berrios, Rakowicz, & Hodges, 2000). In comparison, another study, employing the Mini Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975) across seven hostel sites in Sydney, indicated an impairment rate of 10% (Bremner, Duke, Nelson, Pantelis, & Barnes, 1996; Buhrich, Hodder, & Teeson, 2000). The prevalence of severe long-term alcohol misuse in Gilchrist and Morrison’s (2005) sample, may have contributed to the higher impairment rate observed. Similarly, Depp et al.’s (2015) review reported that individuals with significant mental health (MH) issues tended to score lower, alluding to the impact of a person’s MH on cognitive functioning. This is suggested in a study of female shelter residents in London. Adams, Pantelis, Dukes, and Barnes (1996)
reported that individuals with severe MH issues averaged an IQ of 74 compared to 80 for those without MH difficulties.

Screening tools such as the MMSE, which has had its effectiveness questioned (Folstein and Folstein, 2010), provide limited information regarding a person’s actual cognitive functioning (Depp et al., 2015; Spence et al., 2004). Some studies have sought to investigate general cognitive ability using more thorough neuropsychological assessments (Andersen et al., 2014). This body of research reports mean cognitive scores either in the below average or impaired categories (Depp et al., 2015; Stergiopoulos, Dewa, Durbin, Chau, & Svobda, 2011, Bousman et al., 2010). Despite these methodological issues, research indicates that the risk of cognitive impairment is greater in those experiencing homelessness than adults over the age of 70, who represent a high risk group for impairment (Sheffield and Peek, 2011).

Some of the primary causes of cognitive difficulties include traumatic brain injury (TBI), substance misuse and MH difficulties (Backer, Howard, Howard, Howard, 2007). Research reports these issues are frequently experienced in those experiencing homelessness (Fazel, Kholsa, Doll, & Geddes, 2008; Martens, 2001; Stergiopoulos, Dewa, Dubrin, Chau, & Svobda, 2010; Stergiopoulos et al., 2015a; Topolovec-Vranic et al., 2012). Substance misuse and MH difficulties in homelessness have attracted significant investigation compared to the other factors (Fazel et al., 2008; Martens, 2001; Stergiopoulos et al., 2010; Topolovec-Vranic et al., 2012). This has contributed to an increased awareness of the high levels of MH issues, such as schizophrenia, depression, and substance/alcohol misuse in homelessness (Fazel et al., 2008; Martens, 2001; Stergiopoulos et al., 2010). Other issues associated with cognitive difficulties, such as ID or TBI, have not garnered similar levels of investigation.
However, recent research has begun to explore their contribution. A 2012 review of TBI in homelessness identified just eight studies in the previous 130 years on the topic (Topolovec-Vranic et al., 2012). The author identified a further 17 studies exploring the issue in the subsequent years. Overall, these studies indicate that approximately 50% of those experiencing homelessness have incurred a TBI in their lifetime (Bremner et al., 1996; Hwang et al., 2008; Oddy, Moir, Fortescue, & Chadwick 2012; Solliday-Mcroy, Campbell, Melchert, Young, & Cisler, 2004). As with MH issues, those with a TBI scored lower on cognitive assessments (Andersen et al., 2014, Topolovec-Vranic et al., 2012). This research has been translated into practice in some areas. Pathway, a leading UK homeless healthcare charity, incorporated a dedicated acquired brain injury (ABI) and homelessness strand at their 2018 Inclusion Health conference; while in Liverpool, UK, a dedicated neuropsychological service has been developed for individuals with a brain injury experiencing homelessness (Forrester, Weatherhead, Rosebert, Hewett, & Worthington, 2017). In spite of these developments, other issues affecting a person’s cognitive ability have not garnered the same level of investigation, in particular that of intellectual disability (ID).

**Intellectual Disability (ID)**

International definitions of ID generally share the following key criteria: There should be significant impairment of both intellectual functioning and adaptive behaviour (as expressed in difficulties with conceptual, social, and practical skills), with both impairments present before adulthood (Schalock et al., 2010, World Health Organisation (WHO), 1992). In order to assess ID a comprehensive assessment is required that investigates each of these criteria. The level of cognitive impairment required for a diagnosis of ID is at least two standard deviations below the norm, or an IQ score no higher than 70, as measured by a standardised cognitive assessment which itself must meet particular criteria (e.g. provides an overall score and index/composite scores).
The Wechsler Adult Intelligence Scale – Fourth Edition (WAIS-IV) (Wechsler, 2014) is the most frequently employed measure, and the only tool that currently meets the criteria for ID assessment set by organisations such as the BPS (BPS, 2015). However, there are issues that affect the outcome of all cognitive assessments. The WAIS-IV, like many of the frequently used assessment tools, was developed in the context of a Western educated, English speaking population (Shuttleworth-Edwards, 2012). Consequently, many tools have shown to be culturally biased, and standardised and normed in relation to a single’s country’s population (BPS, 2015). This can disadvantage individuals from other populations or cultures and increase the likelihood of them receiving a diagnosis of ID, when they do not actually meet the criteria.

Similarly, socioeconomic status (SES) has consistently demonstrated a strong correlation with neurocognitive development and subsequent educational attainment (Emerson, Hatton, & Robertson, 2011; Ferguson, Bovaird, & Mueller, 2007). For example, a study in Canada reported that children from lower SES backgrounds performed worse on a receptive vocabulary test when compared to children from a higher SES (Wilms, 2003). Higher incomes were associated with better educational outcomes, with the effects being largest for cognitive and school measures (reading and math scores) (Phipps and Lethbridge, 2006). This body of research suggested that children from low-income families are disadvantaged throughout their education and this is reflected in their performance on cognitive assessments (Ferguson et al., 2007).

The level of cognitive difficulties associated with ‘severe’ impairments are those that fall three standard deviations below the norm. This amounts to a score of approximately 55 or less on measures with a mean of 100 and standard deviation of 15 (BPS, 2015). This type of ID is more frequently associated with a wide array of prenatal, perinatal, or postnatal issues (Chapman,
Scott, & Stanton-Chapman, 2008). The heterogeneous nature of these biomedical causes of ID make prevention difficult (Alexander, 1998), particularly considering a cause is only identified in 50% of cases (Winnepenningkx, Rooms, & Kooy 2003). Alternatively mild ID, typically related to an IQ of 55-70, is linked primarily with sociocultural and environmental causes (Burack, 1990). Even when a single gene disorder has been the cause of cognitive impairment, environmental factors still influence its expression (Horowitz and Haritos, 1998). Furthermore, the majority of the biomedical contributors of severe LD also have a strong correlation with mild LD (Accardo and Capute, 1998).

Those with severe impairment may be more easily identified and supported off the streets in light of their vulnerability (Morton and Cunningham-Williams, 2009; Stavrakaki, 2002). However, those with mild ID may be better able to adapt, such as by adopting ‘street-savvy’ behaviours or withdrawing from sight, which may result in them being overlooked by service providers (Goffman, 1990; Petersilia, 2000). ID may also go undetected in research, as researchers more aware of the prevalence of MH issues and substance misuse in homelessness (Klinkenberg, Sacks, & for the HIV/AIDS Treatment Adherence, Health Outcomes, & Cost Study Group 2004), may focus their questions on these issues while ID or attendance at a special education school is not questioned (Cottler et al., 1998; Morse et al., 2006). Consequently, this may lead to cognitive difficulties being attributed to intoxication or psychological distress, when they are co-morbid with ID, rather than being the primary source of cognitive impairment (Christian & Poling, 1997).

A consequence of the recession, which was associated with rises in homelessness worldwide, has been a reduction to many of the social ‘safety nets’ supporting the independence of people, such as those with ID, who experience disadvantages in society (Fitzpatrick, Pawson, & Bramley, 2015; Schrecker and Milne, 2015). Homelessness can often be a consequence of
significant poverty experienced by those who have histories of MH issues, disabilities, and substance misuse problems (Rossi & Wright, 1987). In the UK, a strong relationship was found between reductions in government spending on welfare and rises in homelessness rates (e.g. social care and housing support) (Loopstra et al., 2016). This suggests that individuals who are more likely to be reliant on government support, such as those with an ID, are particularly vulnerable to homelessness. The barriers faced by those with an ID to access employment is a key source of vulnerability. Paid employment rates are particularly low for those with an ID, with reported rates of 15% in the US (Domin & Butterworth, 2013), 25% in Canada, and just 6% in the UK (down from 7% the previous year) (Emerson et al., 2011). This is despite these countries having policies to prevent discrimination against people with an ID. According to the WHO, people with a disability often lack the training and resources to secure employment, and face hostile work environments (WHO, 2011).

**Current Review**

Due to the high proportion of cognitive impairment in the homeless population, and the vulnerability of those with an ID to homelessness, a scoping review was conducted to identify studies containing a sample of participants experiencing both homelessness and ID. The review will focus on the following questions:

1. What is the existing evidence of ID in the homeless population?
2. What methods have been employed to explore ID in homelessness and which are the most robust?
Method

This review was informed by the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement (Moher, Liberati, Tetzlaff, & Altman, 2009) (see Appendix A).

Inclusion Criteria

To increase the potential of all relevant research being included, eligibility criteria were kept broad and inclusive. However, there were a number of essential criteria. Firstly, papers needed to be published in English (the author’s language) and employ a quantitative research methodology (for comparison purposes). As such, qualitative studies and review papers were ineligible. To support comparison across the studies, each study must have used an original sample, which included adults with an ID experiencing homelessness. To support the inclusion of quality research, only articles that have been published in peer-reviewed journals were eligible.

Sources of information and data collection

The following databases were searched for eligible articles published up until the date of the search (Nov 20th 2017): PsycINFO, Pubmed, Web of Science, and Academic Search Ultimate. Each database was searched for studies investigating both homelessness and ID using Boolean operators. There were different terms used for ID across countries such as “learning disability” in the UK. Consequently, different databases had different search terms for example "Learning Disabilities" or "Learning Disorders" or "Intellectual Disabilities" were used for PsychINFO. Similarly, there were multiple terms for homelessness such as “homelessness” and “homeless person”. See Appendix B for the full list of search terms used for each database. The reference lists of relevant articles from the databases were manually searched. The author
reviewed the titles and abstracts of studies to identify whether they met the eligibility criteria. Subsequently, articles and duplicates were excluded if they did not meet the criteria. The remaining articles were reviewed in full to assess whether they met the inclusion criteria. The articles included in the review were subsequently analysed by the author in order to extract data relevant to the aims outlined above. This included data regarding the assessment of ID, sample selection, participant characteristics, and the main findings relating to homelessness & ID.

**Study Quality**

Study quality was examined according to two categories: methodological quality and reporting quality. The Newcastle Ottawa Scale (NOS) was used to analyse studies’ methodological quality (Wells, et al., 2000). In a review of 193 measures that examine the quality of non-randomised research, the NOS was one of only six tools considered sufficiently robust for use in systematic literature reviews (Deeks et al., 2003). While originally designed for assessing the quality of case-control and cohort studies, the NOS has also been adapted to assess cross-sectional studies (Herzog et al., 2013), and the author made minor adaptations (highlighted in bold) for the purpose of the current review (see Appendix C). The NOS examines three domains: selection, comparability, and outcome. A star system is used to determine methodological strength across the three domains. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement was employed to analyse the quality of reporting (Vandenbroucke et al., 2007). The statement comprises of a 22 item checklist, made up of items considered essential in the reporting of observational studies (see Appendix D). This review awarded each paper a score out of 22, with higher scores indicating a higher quality of reporting.
Results

Study Selection

As per the PRISMA guidelines, Figure 1 outlines the review’s retrieval and selection process. The database search described above identified 99 studies. After duplicate records were removed, 78 titles were screened with a further 13 removed as they did not examine homelessness and ID. 65 abstracts were fully screened. Upon screening, 45 of these lacked a sample of participants experiencing both homelessness and ID and ten studies were removed for not being research papers (e.g. review papers). The full-text of the remaining 10 articles were reviewed with six meeting the inclusion criteria (one lacked an original sample, one was not in English, one lacked a sample of adults experiencing homelessness and ID, while another was not peer reviewed). An additional study identified via reference list review of these studies also met the review’s criteria. The seven studies that satisfied all criteria are displayed in table 1.

INSERT FIGURE 1

INSERT TABLE 1

Study quality

The methodological and reporting quality of the studies are displayed in table 2. An overall NOS score was not provided as this could provide a distorted perception of a study’s methodological quality. Deficits in any one aspect of the methodology can substantially impact the validity and reliability of subsequent findings. The NOS selection items explored the extent to which participants represented the population investigated, determination of sample size, and the tools used to identify ID. Four of the studies scored three out of a maximum five stars for selection (Mercier & Picard, 2011; Nishio et al., 2017; Oakes & Davies, 2008; Van Straaten et al., 2017) two scored two stars (Gouveia et al., 2017; Morton & Cunningham-Williams, 2017)
with the remaining study scoring a single star (Tripathi et al., 2013). The key areas affecting the quality of selection processes were the lack of random sampling and validated measures. These will be discussed in greater detail below. Studies did not outline how their sample sizes were determined, but rather the number was based upon the available pool of participants (e.g. all those who had attended a particular service). The NOS comparability items assessed whether studies considered or discussed the confounding variable of age or any other variables such as gender. As ID was usually secondary to the main analysis in the reviewed studies, this section was adapted from these variables needing to be controlled. This was a particular area of weakness for studies with only four of the seven studies achieving a single star and just one considering an additional variable. The final section evaluated the statistical analysis of outcomes. Most of the studies described the statistics employed reasonably well with six scoring the maximum one star. One study did not adequately describe their analysis. Overall, the NOS highlighted multiple issues in the methodological approaches of the studies. The quality of reporting as assessed by the STROBE checklist ranged from 14-20 out of a maximum of 22. This indicates a moderate level of reporting strength in the studies. However, an area in which studies performed poorly was their reporting of the attempts made to address potentials sources of bias.

**Setting of Studies**

Studies were conducted across a wide geographical area, one from each of the following countries the US, Canada, Japan, Mozambique, India, the Netherlands, and the UK. Six of the studies employed a cross-sectional design, with only one adopting a longitudinal approach (Van Straaten et al., 2017). Four of the studies recruited primarily from single sites (Nishio et al., 2015, Oakes and Davies, 2008, Mercier and Picard, 2011, Tripathi et al., 2013), with the remaining samples recruited across multiple cities (Van Straaten et al., 2017; Gouveia et al.,
2017), or multiple settings in a single city (Morton and Cunningham-Williams, 2009).

Participants were recruited primarily from a variety of homelessness support services such as welfare centres, shelters, or a mixture of both. One study also recruited directly from streets in urban areas.

**Participants**

Sample sizes were generally small with only two studies consisting of more than 100 participants (Tripathi et al., 2013, Van Straaten et al., 2017). The median sample size was 68. The mean age range across samples spanned from 33.6 to 56.8 years old with five studies having a mean participant age between 30-40 years old; while the remaining mean ages were 43 years (Mercier and Picard, 2011) and the highest of 56 years old (Nishio et al., 2015). Female participants were recruited in seven of the eight studies, yet they were the minority with males comprising 50% - 100% of each sample. Due to the international nature of the studies, there was a range of ethnicities and nationalities represented, which was reported in various ways. While two of the studies did not report these variables (Oakes and Davies, 2008, Mercier and Picard, 2011), in the remaining five there was a trend for the sample to reflect the regions’ largest nationality or ethnic group. This included samples made up of 100% Japanese (Nishio et al., 2015), 100% African (Gouveia et al., 2017), 100% Indian (Tripathi et al., 2013), 60% Dutch (Van Straaten et al., 2017) and 93.5% African-American (Morton and Cunningham-Williams, 2009). The US sample (Morton and Cunningham-Williams, 2009) consisted primarily of African-American participants reflecting their over-representation in US homelessness (Palmer, 2016).
ID & Homelessness

The majority of studies relied on different forms of self-report to identify participants with an ID. Nishio et al. (2015) compared Wechsler Adult Intelligence Scale – Third Edition (WAIS-III) (Wechsler, 1997) and Japanese Adult Reading Test (JART) (Matsuoka and Kim, 2007) scores. Based on the National Adult Reading Test (NART) (Nelson, 1978), the JART requires participants to read irregularly spelled words to estimate intelligence, based on the premise that it is rare for people to lose this ability. The study identified participants with a suspected ID by comparing their JART score with the WAIS-III score; the authors state that a relatively stable low score across both tests suggests lifelong cognitive impairment as in the case of ID. Van Straaten et al. (2017) employed the validated Hayes Ability Screening Index (HASI) which is a validated ID screening tool for non-clinicians (Hayes, 2002). The HASI includes items pertaining to cognitive ability, adaptive skills, and possible difficulties with these domains in childhood. Gouveia et al (2017) identified participants with an ID based on psychiatrist led interviews using a questionnaire exploring social skills. While this was completed by a clinician, no information was provided regarding how ID specifically was assessed. The final self-report method, asked participants whether they had an ID, or attended a special education school (Morton & Cunningham-Williams, 2009). No information was provided regarding additional assessment procedures.

The remaining three studies employed more comprehensive approaches for identifying ID. Tripathi et al. (2013) reviewed participants’ medical files. However, insufficient data was provided regarding the measures used to diagnose ID, stating only that intelligence assessments were completed as required. This makes it difficult to report on the accuracy of the diagnosis. Mercier and Picard (2011) also utilised a medical history review. The authors provided more
information than Tripathi et al (2013) regarding the data reviewed. This included special education attendance, formal diagnoses by clinical psychologists and psychiatrists, as well as recorded difficulties with adaptive functioning. While the chart review provided objective evidence of diagnoses, the study did not outline the criteria on which the chart review was based.

Lastly, Oaks and Davies (2008) clearly outlined that their definition and classification of ID was advised by guidelines published by the American Association on Intellectual and Developmental Disabilities (Luckasson et al., 2002). Their data collection involved a clinical assessment of participants’ cognitive and adaptive functioning, as well as a chart review to determine whether difficulties were present in childhood. This is the sole reviewed (field) study that investigated these criteria with full accordance to clinical guidelines. Consequently, it is apparent that the proportion of ID reported in samples were developed using a range of different approaches.

Figure 2 presents the percentages of ID reported in the samples of the six studies which attempted to quantify ID in their samples (Mercier & Picard (2011) solely recruited participants they identified as having an ID). The proportions observed ranged from 5.6% to 39%. Four of the studies were in a relatively small range of 5.6% to 12.9% (Gouveia et al., 2017, Crotty, 1998, Morton and Cunningham-Williams, 2009, Zima et al., 1998) while the remaining three were 25.7% (Tripathi et al., 2013), 31% (Van Straaten et al., 2017) and 39% (Nishio et al., 2015) respectively. The median proportion observed in samples was 12.9%. The highest percentage of ID was reported in the Japanese sample of 18 participants (Nishio et al., 2015); seven participants had both premorbid and WAIS-III scores in the region of cognitive impairment, which the authors considered indicated ID (adaptive functioning and developmental history of impairment were not explored). The next highest figure was identified using the HASI, which the
authors caution is a screening tool for a suspected ID, not a diagnostic instrument (Van Straaten et al., 2017). The lowest number was reported in Gouveia et al. (2017), which used a non-validated psychiatrist administered questionnaire. Oaks and Davies (2008), the sole field study employing an approach advised by international guidelines, reported that 12% of their sample met the clinical criteria for ID. Morton & Cunningham-Williams (2009) reported a similar figure of 12.9% however, they employed the substantially less reliable approach of a brief self-report questionnaire to detect ID.

Only one study provided detailed information regarding the cognitive functioning of participants (Nishio et al., 2015). The mean IQ for participants in this sample was 83.4 (SD = +/- 27.4), over one standard deviation from the norm, with performance IQ lower at 80.8 (SD = +/- 19.3). Using the WAIS-IV, the study identified seven participants as having an ID, three with mild ID (IQ= 56-70), three with moderate ID (40-55), and one participant with severe ID (39 or less). All participants in the moderate category were borderline mild-moderate with IQ scores of 49, 53, and 54 respectively. It is key to note that these categories are based solely on cognitive scores without consideration of adaptive skills or developmental history.

INSERT FIGURE 2

Issues affecting participants experiencing homelessness with a suspected ID

In three of the reviewed studies, participants with a suspected ID reported experiencing MH difficulties. Employing their chart review approach, Mercier & Picard (2011) identified MH issues in 60% of their sample which, they report consisted solely of individuals with an ID. Tripathi et al. (2013) reported a 39% co-morbidity between ID and MH difficulties however, they did not define their use of ‘ID’ or how it distinguishes from mental retardation which is used elsewhere in their paper. Nishio et al. (2015) outlined that 70% of their participants with a
premorbid IQ and overall cognitive score in the region of ID, also reported MH difficulties. Mercier and Picard (2011) further highlighted that substance misuse was the catalyst for homelessness in over a third of their sample (37%). The findings from Nishio et al.’s (2015) study suggested that participants with premorbid/overall IQ scores in the region of ID who reported MH difficulties had a much longer history of homelessness; other participants with these scores but without MH difficulties, were younger than the rest of the sample. Similarly, Van Straaten et al. (2017) reported that participants with a suspected ID in their sample had care needs for longer.

Oakes and Davies (2008) outlined that homelessness was experienced by their participants, despite being identified in childhood as requiring support for an ID. The two service evaluation studies reported that effective multi-agency collaboration including public services (e.g. MH services, the police, and judiciary), non-government organisations, and research groups could make a significant difference to the wellbeing and housing status of those affected by homelessness (Tripathi et al., 2013, Gouveia et al., 2017). However, Gouveia et al. (2017) reported that participants with a suspected ID had significant difficulty reintegrating into their family, even with dedicated support, with none returning to family life, while those with substance misuse or psychiatric diagnoses were more successful. While collaboration contributed to a rehoming rate of 70% in the Tripathi et al.’s (2013) sample, the authors did not discuss whether ID was associated with similar reintegration difficulties as described by Gouveia et al., (2017).

Discussion

This review sought to identify studies which investigated ID in homelessness and examine the methodology they employed. Seven studies were identified that met the inclusion
criteria, highlighting the lack of attention the topic has received. The paucity of research suggests a lack of awareness, or consideration, for the possibility that people with an ID experience homelessness. Moreover, only four of these directly focused on ID and homelessness. This is despite three systematic literature reviews identifying a high prevalence of cognitive impairment, a key criteria for ID, in people experiencing homelessness (Bremner et al., 1996, Spence et al., 2004, Depp et al., 2015). Poverty consistently features in the literature as a predictor of both homelessness (Sharam and Hulse, 2014), and mild ID (Emerson, 2007, Chapman et al., 2008).

Families supporting a child with an ID are also more vulnerable to poverty and homelessness due to significant direct and indirect costs which may not be adequately covered by welfare benefits. These include additional childcare costs, clothes, (Newacheck & Kim, 2005), and lower rates of employment for mothers (Loprest & Davidoff, 2004). Parents of children with a mild ID can also experience financial hardship due to its link with low SES (Emerson, 2007, Emerson, Shahtahmasebi, Lancaster, & Berridge, 2010).

Despite this overlap, the majority of studies investigating cognitive impairment in homelessness primarily examine issues such as MH difficulties, alcohol/substance problems, and more recently brain injuries rather than the possibility of developmental contributors such as ID. This was reflected in the current review whereby ID tended to be supplementary to, rather than the focus of, the main analysis. Two of the reviewed studies consisted of evaluations of services for individuals experiencing homelessness with suspected MH difficulties (Gouveia et al., 2017; Tripathi et al., 2013). Another served as a pilot for a study exploring cognitive impairment in homelessness which included an estimate of premorbid functioning (this limited indicator was subsequently omitted from the larger study) (Nishio et al., 2015). The studies were conducted in seven different countries, suggesting that the issue of ID in homelessness has thus far failed to
generate sufficient concern in a single region. This is possibly influenced by several of the studies being published in lesser known regional journals.

While the wide geographical distribution of the studies further highlights homelessness as a global issue, it does not contribute towards the examination of issues in this field. A key issue relates to balancing sample representativeness with the challenges of recruiting participants from a population with multiple complex needs. The samples of all seven studies were recruited from various homelessness services with contrasting levels of specialism. Two were from homelessness MH services, two from welfare centres, and one each from a homelessness GP practice, support service, and soup kitchen (although in the latter participants were also recruited directly from urban areas). No study employed a structured randomisation process. Consequently, the characteristics of the samples were influenced by the procedures and subsequent barriers involved in accessing these services. Individuals who successfully access these services are represented in the research, while those who wouldn’t (or couldn’t) seek their support are omitted. The consequence being that the pool of potential participants and their diversity is reduced. Males (frequently white), in the 30-40 year age bracket, making up the majority of each sample is one example of how representativeness may have been affected by recruitment approaches. The experience of individuals from minority ethnic groups and women as well as younger/older people affected by homelessness were largely absent from the studies reviewed. A number of factors may have affected this outcome including the added barriers faced by some of these groups in accessing services. Homelessness can accentuate the discrimination faced by individuals in their daily lives such as that experienced by those from black or LGBT+ communities. Consequently, individuals may avoid services such as hostels in order to stay safe. This was further impacted by the different operational definitions of
homelessness used across studies, so that individuals who participated in one study may be considered ineligible in another. Also, no study employed the use of a control group or referenced population norms for ID.

Another significant methodological issue present in the studies is the contrast observed in ID assessment methods. As outlined above, there are specific criteria required for diagnosing ID which are widely accepted. These are an impairment of intellectual ability and adaptive skills, both of which are present before adulthood (Schalock et al., 2010). These three criteria provide the framework with which specialist ID services develop structured approaches for ID assessment. The majority of the studies reviewed did not assess for ID according to these criteria or make any reference to them. Again this may have been influenced by ID being a periphery consideration of the main analysis. It also reflects the difficulties of conducting homelessness field research, whereby researchers must negotiate an acceptable level of thoroughness in the limited time available with participants.

A full ID assessment requires significant time and clinical expertise. If the study’s main objective was not related to ID, then it is possible researchers employed more pragmatic, but less reliable measures, such as non-validated questionnaires or clinical judgement, in an attempt to provide some insight into the level of ID in their sample (Gouveria et al., 2017; Nishio et al., 2015; Tripathi et al., 2013). However, studies’ lack of consideration of their non-adherence to these criteria can be unhelpful, particularly when accompanied by a lack of tentativeness in the reporting of the proportion of ID observed. All three criteria were only considered, directly or indirectly, in three of the reviewed studies (Mercier & Picard, 2011; Oakes & Davies, 2008; Van Straaten et al., 2017). These studies shaped their methodology with different levels of adherence to the criteria. Oakes and Davies (2008) were the most comprehensive, conducting full clinical
assessments including chart review, largely reflecting the approach of specialist ID services. It could have been bolstered by the interviewing of family members however, this would likely be unfeasible in this context. Next, Mercier & Picard (2011) used a chart review made up of clinical notes which they described as including 20 psychologist/psychiatrist diagnoses however, their findings could have benefited from more detailed information regarding the nature of the data extracted from medical files. The Hayes Ability Screening Index (HASI) (2002) was used in the final study which explicitly considered clinical guidelines when outlining their methodology (Van Straaten et al., 2017). The authors were appropriately cautious in asserting that the HASI identifies only those with a suspected ID, an awareness that is not evident in many of the studies which employed less validated approaches (e.g. Gouveia et al., 2017). This brief screening tool has been shown to correlate with several cognitive assessments including the Wechsler Adult Intelligence Scale III (WAIS-III; Wechsler, 1997) and those measuring adaptive behaviour such as the Vineland Adaptive Behaviour Scales (Sparrow, 2011) (To, Vanheule, Vanerplasschen, Audenaert & Vandevelde, 2015). In terms of convergent validity, a significant positive relationship has been reported between the HASI and the full-scale IQ of the WAIS-III with varying strengths including 0.55 (young offenders), 0.69 (service-users with a dual diagnosis), and 0.81 (psychiatric setting) using Pearson’s r correlation (Ford et al., 2008; Sondenaa, Bjorgen, & Nottestad, 2007; To et al., 2015). A Receiver Operating Characteristic (ROC) analysis reported a specificity and sensitivity of 80% (when cut-off score was 85) for identifying ID (To et al., 2015). Combined with its brief application time and ease of use for non-clinicians the HASI may provide an appropriate balance between feasibility and methodological robustness. This is further supported by research indicating findings are not distorted by substance use or other psychiatric illness which are widely experienced in this population (To et al., 2015).
A consequence of the wide range of assessment methods employed is the different concepts reported by study regarding percentage of ID in samples. For example, the percentage of people who replied in the affirmative when asked whether they had an ID, is qualitatively different to the number of individuals who met all three ID criteria following an extensive assessment. Unfortunately, due to these contrasting assessment measures, the ability to make comparisons or inferences is limited. The 12% reported via a full clinical assessment, while quite a robust methodology, is nevertheless based on a small sample size of 50 (6 participants with an ID) (Oakes & Davies, 2006) impacting the generalisability of the finding. The largest sample of 336 did involve the use of the HASI (Van Straaten et al., 2017) however, as it is the only study to use the measure, further research is required to explore the validity of these findings in the context of homelessness. Subsequently, the methodological issues and contrasting approaches utilised hinder exploration of key issues in this area. These include queries regarding the likelihood of a person with an ID experiencing homelessness and their potential pathways into homelessness. Moreover, no study discussed the possible role of poverty, SES and their associated barriers such as access to education when exploring ID and homelessness. In order for research to begin to consider such questions the methodological concerns highlighted in this review need to be discussed further.

The findings of the studies conveyed a picture of participants with a suspected ID experiencing considerable hardship and vulnerability. This included co-morbidity with MH (Mercier & Picard, 2011; Nishio et al., 2015; Tripathi et al., 2013); homelessness at a younger age (Nishio et al., 2015); lack of opportunity to return to their families (Gouveia et al., 2017); care needs for longer (Van Straaten et al., 2017), and difficulty understanding consent (Morton & Cunningham-Williams, 2009). It is outside the scope of the current review and beyond the
capabilities of the available evidence to make comparisons or hypotheses based on these findings. However, as in the case of TBI, one would expect the cognitive impairment alone associated with ID would present multiple barriers to exiting homelessness such as the successful navigation of the health and social care systems.

Implications

As observed in previous research exploring cognition, brain injury, and homelessness, the approach to assessing cognitive ability heavily influenced outcome (Spence et al., 2004, Depp et al., 2015, Topolovec-Vranic et al., 2012). Ideally a comprehensive neurocognitive assessment and medical record review would be employed to conclusively assess for ID. However, in field research this is usually impracticable. While comprehensive assessments contribute towards a greater understanding of individuals’ circumstances, their taxing and lengthy nature may not be tolerated well by this population. As one of the most vulnerable groups in society, individuals without a home are experiencing multiple difficulties at any one time (Frankish, Hwang, & Quantz, 2005; Martens, 2001). Also, researchers may not always have access to multiple packages of licensed tests like the WAIS. Thus the resources and time available to researchers are a significant factor in choice of assessment tool. While there is no definitive answer, continuing to employ a wide range of approaches could hinder understanding of any possible relationship between homelessness and ID. In light of the pressing issues of time, limited resources, and multiple needs inherent in this population a full diagnostic approach will unlikely be feasible on a large scale. Van Straaten et al.’s (2017) approach which employed the HASI may be a possible way forward. The screening tool approach may provide an acceptable compromise between pragmatics and robustness this field requires. While validated with
individuals experiencing issues related to homelessness (substance misuse, offending history, MH issues), this has yet to be conducted specifically with a homeless sample.

**Strengths & Limitations**

The key strength of this review is its exploration of a largely unexamined area. As with TBI and homelessness, further research may identify them as a group whose needs are being overlooked. It is hoped that the findings of this review can facilitate discussion regarding how to address the challenges highlighted. There were limitations in the review methodology which may have affected the results outlined above. Firstly, the review would have benefited from a second reviewer to assess both the eligibility and quality of the papers included. A second reviewer could have supported further consideration of issues such as the lack of a consistent method for identifying ID, the limited number of studies, and small sample sizes.

**Future Directions**

The area would benefit from further research exploring an appropriate approach for identifying ID in those experiencing homelessness. One possible route is the utilisation of a screening tool such as the HASI, a validation of its use in this population would make a substantial contribution to the field. Such a study would need to incorporate the international criteria for identifying ID. This could then provide interested researchers with guidance on how best to proceed compared to the existing contrasting methodologies employed. Due to the lack of research in this area, the research would benefit from increased professional links between existing researchers/practitioners. This may promote cross-cultural collaboration, learning, and the sharing of knowledge in the context of limited resources. It could also foster discussions regarding key issues, such as appropriate methods for identifying ID and addressing representativeness in samples. A collective voice could provide an added influence on policy and
practice, so that research results can translate to improvements for those it recruits. As observed with TBI, such collaboration can have direct results including the development of dedicated services and increased research.

Another key issue that has not been addressed in the studies above relates to education attainment. Many individuals experiencing homelessness may not have had sufficient access to education. Consequently, their neuropsychological profile may suggest an ID when in fact they have not received an adequate education. Assessments such as the WAIS-IV contain subtests which assess information individuals often learn at school thus lower cognitive scores can indicate poor access to schooling rather than an ID. Future research will need to consider how best to address this issue in order to distinguish between these two issues.

Conclusion

This review found that there were numerous approaches to exploring ID in the homeless population. The robustness of these approaches varied considerably with several relying solely on non-validated self-report. Further issues included small sample sizes and biases in recruitment strategies. Due to the level of multiple, complex needs (e.g. mental health issues, substance misuse, and brain injuries) experienced by this group, researchers must negotiate a balance between feasibility and methodological robustness. Consequently, a full ID assessment as per accepted guidelines is unlikely to be pragmatic. Further research is required to ascertain an appropriate way forward such as the use of brief validated IQ screening tools.
References


Andersen, J., Kot, N., Ennis, N., Colantonio, A., Ouchterlony, D., Cusimano, M. D. & Topolovec-Vranic, J. (2014) Traumatic brain injury and cognitive impairment in men who are homeless. Disability and rehabilitation, 36(26), 2210. DOI:
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BPS (2015). *Guidance on the assessment and diagnosis of intellectual disability in adulthood.* Leicster. Available at: 


DOI: 10.1111/j.1469-8749.1999.tb00590.x


Fazel, S., Khosla, V., Doll, H. & Geddes, J. (2008). The Prevalence of Mental Disorders among the Homeless in Western Countries: Systematic Review and Meta-Regression Analysis (*Mental Disorders among the Homeless*, *PLoS Medicine, 5*(12), 225. DOI: 10.1371/journal.pmed.0050225


DOI: 10.1177/0891988710375213


DOI: 10.1016/j.psychres.2005.07.037

Homeless World Cup Foundation (2018) Global Homelessness Statistics. Available at:


DOI: 10.1093/pubmed/fdv126


DOI: 10.1007/s10597-006-9050-y


Nishio, A., Yamamoto, M., Ueki, H., Watanabe, T., Matsuura, K., Tamura, O., Uehara, R. &


Figures & Tables

Figure 1. PRISMA flow diagram detailing study selection process
Table 1
Details of reviewed studies (n=7)

<table>
<thead>
<tr>
<th>Study</th>
<th>Type of Study &amp; Setting</th>
<th>Sample size (% female), mean age in years (Standard Deviation), (% White), % of ID in sample</th>
<th>ID assessment method and other measures (if applicable)</th>
<th>ID Criteria Considered</th>
<th>Findings related to the relationship between ID &amp; Homelessness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gouveia et al., 2017</td>
<td>Descriptive study.</td>
<td>71 (7%), 37.83 years (+/- 6.61), (0% White), 5.6% ID (n = 4)</td>
<td>Psychiatrist administered questionnaire on social skills including verbal, non-verbal, and conflict resolution skills.</td>
<td>(2) = Impairment of adaptive behavior</td>
<td>Those with an ID were less likely to reintegrate with family following intervention (0%) compared to those without. Authors suggest this is due to a lack of understanding of ID resulting in stigma due to ID being a permanent condition with an unclear cause.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Year</td>
<td>Study Design</td>
<td>Sample Size</td>
<td>Mean Age</td>
<td>ID Identification Method</td>
</tr>
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</tr>
<tr>
<td>Mercier &amp; Picard, 2011</td>
<td></td>
<td>Descriptive study of 68 adults (37%), 43 years (NR), N/A Study</td>
<td>Chart review of individuals identified as having an ID based on factors such as difficulties with adaptive functioning and attending a special education school. 20 participants had formal diagnosis by clinical psychologist.</td>
<td>(1,2,3) Although degrees of reliability due to the available data in participants’ charts.</td>
<td>Reasons for homelessness: substance misuse (37% - more common in men), breakdown of relationship with parent/loved one (31% - more common in women).</td>
</tr>
<tr>
<td>Morton &amp; Cunningham-Williams, 2009</td>
<td>Cross-sectional study. 62 (24.2%), 36.21 years, (11.58), (65% White), 12.9% (n = 8)</td>
<td>Self-report questionnaire querying ID status and attendance at a special education school.</td>
<td>No clear information regarding assessment criteria.</td>
<td>Inability to demonstrate capacity to consent associated with ID and chronic homelessness.</td>
<td>Inability to demonstrate capacity to consent associated with ID and chronic homelessness.</td>
</tr>
<tr>
<td>Nishio et al., 2015</td>
<td></td>
<td>Descriptive study. 18 (0%), 56.8 years (+/- 6.3), 42-65 years, (0% White – 100% Japanese), 39% estimated ID,</td>
<td>WAIS-III, Japanese, Adult Reading Test (JART), and a semi-structured interview by a psychiatrist.</td>
<td>(1) Diagnosis of ID based on cognitive scores, no details regarding other criteria assessed.</td>
<td>All participants with an ID had a mental illness, were significantly younger &amp; had been homeless at a younger age compared to the rest of the sample.</td>
</tr>
</tbody>
</table>
### Homelessness & Cognition

- **Mean IQ**: 83.4 ± 27.4

#### Oaks & Davies, 2008
- **Prevalence study**
- Participants recruited at GP practice for social excluded groups in a UK city.
- 50 adults (14%), 33.61 years (SD = 10.458), NR, 12% (n = 6) WASI, Adaptive Behaviour Assessment Scale, File Review. Diagnosis in line with accepted standards. Individuals experienced homelessness despite being identified as having an ID.

#### Tripathi et al., 2013
- **Prevalence study in India**
- Participants were patients admitted from the street to a psychiatric unit. 140 adults (17%), 34.61 years (SD = 12.4), NR, 25.7% (n = 36) Medical Record Review. Diagnosis in line with accepted standards. High level of MH difficulties. 70% individuals reintegrated to families. Close collaboration by research groups, NGOs, and government is key.

#### Van Straaten et al., 2017
- **Longitudinal study**
- Participants recruited from a larger study in four Dutch cities at a social relief office or temporary accommodation. 336 (26.3%), 37.8 years, (% White unknown, but 59.8% Dutch), 31% suspected LD. Hayes Ability Screening Index. (1,2,3) Via a brief but validated screening tool. Care needs for a longer period of time vs non ID group and prefer support via an appointment.
Table 2

Assessment of methodological and reporting strength of reviewed studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Selection (Max 5*)</th>
<th>Comparability (Max 2*)</th>
<th>Outcome (Max 1*)</th>
<th>STROBE (Max 22)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oakes &amp; Davies, 2008</td>
<td>***</td>
<td>*</td>
<td>*</td>
<td>16</td>
</tr>
<tr>
<td>Mercier &amp; Picard, 2011</td>
<td>***</td>
<td>**</td>
<td>*</td>
<td>18</td>
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<tr>
<td>Nishio et al., 2015</td>
<td>***</td>
<td>*</td>
<td>*</td>
<td>18</td>
</tr>
<tr>
<td>Van Straaten et al., 2017</td>
<td>***</td>
<td>*</td>
<td>*</td>
<td>20</td>
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<tr>
<td>Gouveia et al., 2017</td>
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<td>*</td>
<td>*</td>
<td>18</td>
</tr>
<tr>
<td>Morton &amp; Cunningham-Williams, 2009</td>
<td>**</td>
<td>*</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>Tripathi et al., 2013</td>
<td>*</td>
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<td></td>
<td>14</td>
</tr>
</tbody>
</table>
Figure 2. A bar chart depicting the proportion of ID reported across studies.
### PRISMA Checklist

<table>
<thead>
<tr>
<th>Section/topic</th>
<th>Checklist item</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
<td>Identify the report as a systematic review, meta-analysis, or both.</td>
</tr>
<tr>
<td><strong>Structured summary</strong></td>
<td>Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.</td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
<td>Describe the rationale for the review in the context of what is already known.</td>
</tr>
<tr>
<td><strong>Objectives</strong></td>
<td>Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).</td>
</tr>
<tr>
<td><strong>Protocol and registration</strong></td>
<td>Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.</td>
</tr>
<tr>
<td><strong>Eligibility criteria</strong></td>
<td>Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.</td>
</tr>
<tr>
<td><strong>Information sources</strong></td>
<td>Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.</td>
</tr>
<tr>
<td><strong>Search</strong></td>
<td>Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.</td>
</tr>
<tr>
<td><strong>Study selection</strong></td>
<td>State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).</td>
</tr>
<tr>
<td><strong>Data collection process</strong></td>
<td>Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.</td>
</tr>
<tr>
<td><strong>Data items</strong></td>
<td>List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.</td>
</tr>
<tr>
<td><strong>Risk of bias in individual studies</strong></td>
<td>Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.</td>
</tr>
<tr>
<td><strong>Summary measures</strong></td>
<td>State the principal summary measures (e.g., risk ratio, difference in means).</td>
</tr>
<tr>
<td><strong>Synthesis of results</strong></td>
<td>Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., $I^2$) for each meta-analysis.</td>
</tr>
<tr>
<td><strong>Risk of bias across studies</strong></td>
<td>Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).</td>
</tr>
</tbody>
</table>
### Additional analyses
Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.

### Study selection
Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.

### Study characteristics
For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.

### Risk of bias within studies
Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).

### Results of individual studies
For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.

### Synthesis of results
Present results of each meta-analysis done, including confidence intervals and measures of consistency.

### Risk of bias across studies
Present results of any assessment of risk of bias across studies (see Item 15).

### Additional analysis
Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).

### Summary of evidence
Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).

### Limitations
Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).

### Conclusions
Provide a general interpretation of the results in the context of other evidence, and implications for future research.

### Funding
Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.

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Appendix B

Database Search Terms

PsycINFO:

<table>
<thead>
<tr>
<th>S3</th>
<th>S1 AND S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2</td>
<td>DE &quot;Learning Disabilities&quot; OR DE &quot;Learning Disorders&quot; OR &quot;Intellectual Disabilities&quot;</td>
</tr>
<tr>
<td>S1</td>
<td>DE &quot;Homeless&quot; OR DE &quot;Homeless Mentally Ill&quot;</td>
</tr>
</tbody>
</table>

Academic Search Complete:

```plaintext
((DE "HOMELESSNESS" OR DE "DOMICILE in public welfare") AND (DE "POVERTY" OR DE "DISCRIMINATION against the homeless" OR DE "HOMELESS families" OR DE "HOMELESS persons" OR DE "HOMELESS shelters" OR DE "HOMELESSNESS -- Law & legislation")) AND (S1 AND S2)

((DE "HOMELESSNESS" OR DE "DOMICILE in public welfare") AND (DE "POVERTY" OR DE "DISCRIMINATION against the homeless" OR DE "HOMELESS families" OR DE "HOMELESS persons" OR DE "HOMELESS shelters" OR DE "HOMELESSNESS -- Law & legislation"))

((DE "LEARNING disabilities" OR DE "NONVERBAL learning disabilities" OR DE "READING disability") AND (DE "LEARNING disabled persons -- Psychology" OR DE "LEARNING disabled teenagers" OR DE "LEARNING disabled women" OR DE "LEARNING disabled youth")) OR (DE "MENTAL disabilities")
```
Pubmed:

Search (((intellectual disabilit*) OR (learning disabilit*))) AND homeless*

Web of Science

TS=(homeless*) AND ("learning disabilit*" OR "intellectual disabilit*" )
Appendix C

Newcastle Ottawa Scale (cross-sectional studies)

Adaptations made for the current review highlighted in BOLD

Selection: (Maximum 5 stars)

1) Representativeness of the sample:
   a) Truly representative of the average in the target population. * (all subjects or random sampling)
   b) Somewhat representative of the average in the target population. * (non-random sampling)
   c) Selected group of users.
   d) No description of the sampling strategy.

2) Sample size:
   a) Justified and satisfactory. *
   b) Not justified.

3) Non-respondents:
   a) Comparability between respondents and non-respondents characteristics is established, and the response rate is satisfactory. *
   b) The response rate is unsatisfactory, or the comparability between respondents and non-respondents is unsatisfactory.
c) No description of the response rate or the characteristics of the responders and the non-responders.

4) Ascertainment of the exposure (Intellectual Disability):
   a) Validated measurement tool or record linkage. **
   b) Non-validated measurement tool, but the tool is available or described.*
   c) No description of the measurement tool.

Comparability: (Maximum 2 stars)

1) The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are discussed.
   a) The study controls for the most important factor (age). *
   b) The study control for any additional factor. *

Outcome: (Maximum 1 star)

1) Statistical test:
   a) The statistical test used to analyze the data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and the probability level (p value). *
   b) The statistical test is not appropriate, not described or incomplete.
## STROBE Statement—checklist of items that should be included in reports of observational studies

<table>
<thead>
<tr>
<th>Item No</th>
<th>Recommendation</th>
</tr>
</thead>
</table>
| **Title and abstract** | 1  
  
  *(a)* Indicate the study’s design with a commonly used term in the title or the abstract  
  *(b)* Provide in the abstract an informative and balanced summary of what was done and what was found |
| **Introduction** |  
  
  **Background/rationale**  
  2  
  Explain the scientific background and rationale for the investigation being reported |
|  
  **Objectives** | 3  
  State specific objectives, including any prespecified hypotheses |
| **Methods** |  
  **Study design**  
  4  
  Present key elements of study design early in the paper |
|  
  **Setting** | 5  
  Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection |
|  
  **Participants** | 6  
  *(a)* **Cohort study**—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up  
  **Case-control study**—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls  
  **Cross-sectional study**—Give the eligibility criteria, and the sources and methods of selection of participants  
  *(b)* **Cohort study**—For matched studies, give matching criteria and number of exposed and unexposed  
  **Case-control study**—For matched studies, give matching criteria and the number of controls per case |
|  
  **Variables** | 7  
  Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable |
|  
  **Data sources/measurement** | 8*  
  For each variable of interest, give sources of data and details of methods of assessment |
(measurement). Describe comparability of assessment methods if there is more than one group

<table>
<thead>
<tr>
<th>Bias</th>
<th>9</th>
<th>Describe any efforts to address potential sources of bias</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study size</td>
<td>10</td>
<td>Explain how the study size was arrived at</td>
</tr>
<tr>
<td>Quantitative variables</td>
<td>11</td>
<td>Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why</td>
</tr>
</tbody>
</table>
| Statistical methods | 12 | (a) Describe all statistical methods, including those used to control for confounding  
                      (b) Describe any methods used to examine subgroups and interactions  
                      (c) Explain how missing data were addressed  
                      (d) **Cohort study**—If applicable, explain how loss to follow-up was addressed  
                          **Case-control study**—If applicable, explain how matching of cases and controls was addressed  
                          **Cross-sectional study**—If applicable, describe analytical methods taking account of sampling strategy  
                      (e) Describe any sensitivity analyses |

**Results**

| Participants | 13* | (a) Report numbers of individuals at each stage of study—e.g. numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed  
             |     | (b) Give reasons for non-participation at each stage  
             |     | (c) Consider use of a flow diagram |
|-------------|-----|--------------------------------------------------|
| Descriptive data | 14* | (a) Give characteristics of study participants (e.g. demographic, clinical, social) and information on exposures and potential confounders  
                     (b) Indicate number of participants with missing data for each variable of interest  
                     (c) **Cohort study**—Summarise follow-up time (e.g., average and total amount) |
| Outcome data | 15* | **Cohort study**—Report numbers of outcome events or summary measures over time |
**Main results** 16

- **Case-control study**—Report numbers in each exposure category, or summary measures of exposure
- **Cross-sectional study**—Report numbers of outcome events or summary measures

(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included

(b) Report category boundaries when continuous variables were categorized

(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period

**Other analyses** 17

- Report other analyses done—e.g. analyses of subgroups and interactions, and sensitivity analyses

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**Discussion**

| Key results | 18 | Summarise key results with reference to study objectives |
| Limitations | 19 | Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias |
| Interpretation | 20 | Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence |
| Generalisability | 21 | Discuss the generalisability (external validity) of the study results |

**Other information**

| Funding | 22 | Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based |

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies*
Research Paper

Title: An Exploration of the Neuropsychological Needs of Individuals Experiencing Homelessness

Short Title: Homelessness and Cognition

Cormac Duffy
Trainee Clinical Psychologist
Division of Health Research

Word count: 7607 (excluding references, tables, figures and appendices)

Target journal: British Journal of Clinical Psychology (see Chapter 5, Appendix B for notes to contributors)

Corresponding author information: Cormac Duffy, (email: duffycormac@gmail.com)
Abstract

Background: Research has identified a higher prevalence of traumatic brain injury (TBI), mental health (MH) issues, and cognitive difficulties in those experiencing homelessness compared to the general population. It also suggests barriers to care exist. A small-scale descriptive analysis of these issues and service-use was carried out to explore the extent of unmet need in the sample.

Method: Participants were recruited from homelessness services across a large UK city, including a hostel and dedicated GP practice. Neuropsychological assessments were conducted with 17 participants. These included the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), Brain Injury Screening Index (BISI), Oxford Capability Questionnaire-Mental Health (OxCAP-MH), a medical record review, and a questionnaire exploring service-use and wellbeing.

Results: Fourteen participants had an overall RBANS score in the region of cognitive impairment (the median overall RBANS score was 59). Scores were low across all domains, with participants performing lowest on the attention [M = 61.53; SD = 16.323] and delayed memory [M = 66.06; SD = 20.64] subscales. TBIs and MH issues were reported by the majority of participants. Participants reported high use of A&E and temporary accommodation while specialist MH or brain injury services were rarely attended.

Conclusions: This study further contributes to existing research which indicates that cognitive functioning, TBIs, and MH issues are commonly experienced in homelessness. It also highlights that specialist services are not accessed for this issues. Future research could build on the study’s methodology to explore how best to support the homelessness population with their neuropsychological needs.

Keywords: homelessness, brain injury, cognitive difficulties, service-use
Crisis, a leading UK homelessness charity, defines the issue as ‘the problem faced by people who lack a place to live that is supportive, affordable, decent, and secure’ (Crisis, 2016, p.1). Homelessness is an increasing societal problem in the UK, with the most recent government statistics indicating a 15% rise in rough-sleeping from 2016 to 2017 with 4,134 people counted as sleeping outdoors (Ministry of Housing, Communities, & Local Government, 2018). This constitutes a 168% rise since counts commenced in 2010. These statistics identify only the most visible group experiencing homelessness. In the year ending March 31st 2017, there were 78,000 families and individuals in temporary accommodation in the UK (Crisis, 2016). Since the global economic recession in 2007, there has been a reversal of the downward trend in homelessness figures observed in the previous decade (Loopstra et al., 2016). The UK government’s response in the form of austerity measures involved cuts to a number of social safety nets including housing support budgets at a time of reduced income (Fitzpatrick, Pawson, & Bramley, 2015; Schrecker and Milne, 2015). Loopstra et al. (2016) conducted an evaluation of changes in statutory homelessness rates across 323 UK local authorities, from 2004 to 2012, and found that a rise in homelessness claims was strongly associated with reductions in government spending on welfare such as housing services and social care. These figures often understate the situation as they represent only those who are visible or seek aid.

Epidemiological studies outline that homelessness is associated with an increased risk of physical harm, infectious diseases, premature mortality, food insecurity as well as multiple morbidities (Bentley, Baker Mason, Subramanian, & Kavanagh, 2011; Cutts et al., 2011; Fazel, Geddes, & Kushel, 2014; Kushel, Gupta, Geem & Haas, 2006; Taylor, Pevalin, & Todd, 2007). This contributes to high levels of premature mortality, which is particularly evident among young people experiencing homelessness with a mortality rate ratio over eight times higher than
that observed in the general population (Hwang, 2000) Homelessness also has strong associations with mental health difficulties. In many developed countries including the USA, Canada, and Germany the prevalence of mental health (MH) problems in the homeless population is as high as 95% (Martens, 2001). Homelessness is often the result of significant poverty in those who have histories of MH issues, disabilities, and substance misuse problems (Rossi & Wright, 1987). Diagnoses of schizophrenia, anxiety, depression, personality disorder, psychosis, and substance/alcohol misuse are observed at a far higher rate in those experiencing homelessness than those with a home (Fazel, Kholsa, Doll, & Geddes 2008; Martens, 2001; Stergiopoulos, Dewa, Durbin, Chau, & Svobada, 2010).

There is a similar link between brain injuries and homelessness (Topolovec-Vranic et al., 2012). Studies have estimated that approximately 50% of people those who experienced homelessness have also experienced a traumatic brain injury (TBI) (Bremner, Duke, Nelson, Pantelis, & Barnes, 1996; Buhrich, Hodder, & Teeson, 2000; Oddy, Moir, Fortescue, & Chadwick, 2012). Homelessness is also associated with injuries such as assault which can lead to a TBI (Kushel, Evans, Petter, Robertson, & Moss, 2003; Zakrison, Hamel, & Hwang, 2004). There is much overlap between the risk factors for homelessness and TBI, including substance misuse (Herman, Susser, Struening, & Link, 1997), and exposure to physical abuse during childhood (Corrigan, 1995). When one considers the risk factors homelessness also shares with dementia and alcohol-related brain injury, it would be unsurprising if these neurological conditions were also overrepresented in homelessness (Brighton, Traynor, Moxham, & Curtis, 2013; Kroll and Naue, 2009).

An absence of longitudinal studies makes it challenging to ascertain the direction of causality in the relationship between TBIs and homelessness. Due to participants’ lack of a fixed
abode, long-term studies are difficult to conduct (Pluck, Lee, David, Spence, & Parks, 2012). However, multiple studies have reported TBIs occurring in adolescence prior to participants experiencing homelessness (51%-87%) (Barnes et al., 2015; Mackelprang, Harpin, Grubenhoff, & Riverara, 2014; Topolovec-Vranic et al., 2014). Once an individual experiences homelessness their susceptibility for further TBIs is significantly heightened due to factors such as increased risk of assault and exposure to risk-taking behaviour (Barnes et al., 2015).

As discussed in chapter one above, a recent systematic literature review exploring homelessness and cognition (Depp, Vella, Orff, & Twamley, 2015) reported a pooled estimate of 25% for cognitive impairment, with a mean estimated IQ of 85, one standard deviation below the norm for the general population. Cognitive impairment is five to eight times more common in those experiencing homelessness compared to the high risk group of adults over the age of 70 (Sheffield & Peek, 2011). This reflects a fairly consistent picture emerging from clinical research of high levels of cognitive difficulties in those affected by homelessness (Burra, Stergiopoulos, & Rourke, 2009; Fry et al., 2017; Nishio et al., 2015; Spence, Stevens, & Parks, 2004).

Cognitive difficulties can stem from a variety of causes such as neurodevelopmental conditions, including learning disabilities and psychiatric disorders, or acquired brain dysfunction as a result of a traumatic brain injury, epilepsy, stroke, dementia or another neurological condition (Depp et al., 2015). As outlined above many of these conditions are prevalent in those experiencing homelessness. Additionally, the malnutrition, environmental exposure, and stress associated with homelessness can have a further negative impact on cognitive ability. A cross-sectional study of 80 individuals experiencing homelessness, compared current and estimated pre-homelessness cognitive ability (Pluck et al., 2012). It reported a significant decrease in cognitive functioning, particularly memory. The authors outline that the
causation is likely multi-factorial relating to a multitude of interrelating issues including MH problems, malnutrition, stress, and head injuries.

Cognitive impairment can interfere with a wide range of mental activities including memory, decision-making, concentration and emotional regulation (Lafferty, 2010, Corrigan and Bogner, 2007). These types of difficulties are associated with poor functional outcomes in social interaction, occupational performance, and independent living (Burra et al., 2009). Consequently, cognitive impairment will likely have a negative effect on a person’s ability to successfully manage a household (e.g. planning and organising utility provision/payment). The capacity to engage effectively with support services aiming to prevent and transition people out of homelessness may also be negatively affected. For example, negotiating welfare or housing systems requires a variety of cognitive activities including concentration, memory, and mental processing ability. If an individual’s skills in these areas are affected they would have substantial difficulty accomplishing this without appropriate support (Forrester, Weatherhead, Rosebert, Hewett, & Worthington, 2017). As such, cognitive difficulties may be an underlying, unrecognised barrier interfering with efforts to reduce homelessness both at a personal and societal level. The unmet neuropsychological needs posed by cognitive impairment hampers the individual’s efforts to exit from homelessness, and that of the different services supporting them (Forrester et al., 2017).

One of the impacts on services is the considerable financial cost. An individual who has been sleeping rough for 12 months costs the state an estimated £20,128 compared to the UK average of £4,600 annual public expenditure per adult (Department of Communities & Local Government, 2012; Lankelly Chase Foundation, 2015). This is due to a number of factors including increased use of health care systems such as accident and emergency (A&E) services,
as well as increased interaction with the criminal justice system (Hwang, 2001). An analysis by Fife Council and Fife NHS indicated that NHS service use is 24% higher in individuals experiencing homelessness compared to the general population, and homelessness increases reoffending rates by approximately 20% (Frankish, Hwang, & Quantz, 2005). A study exploring the service-use of 86 people experiencing homelessness, estimated that preventing homelessness for one year would reduce average yearly public expenditure by £9,266 per person (Please & Culhane, 2016) – due to a reduction in their use of services.

This indicates that when appropriate support is available both the person and society can benefit. However, the substantial overuse of acute and other services suggests that obstacles exist which maintain a situation of rising homelessness and escalating demand on acute services. Given the barriers cognitive impairment can present in exiting homelessness, neuropsychological input may allow for more targeted interventions with greater effectiveness (Argeriou, McCarty, & Mulvey, 1995). This can help inform services regarding adapting support to respond effectively to the needs of individuals with cognitive difficulties (Forrester et al., 2017).

There are a number of key issues to be considered when exploring this issue. Firstly, an appropriate measure for conducting cognitive assessments is essential. The measure needs to represent an appropriate balance between collecting reliable data, administration time, and contextual awareness. One of the most common measures used to explore this relationship has been the Mini Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975). The MMSE is a short measure regularly used to screen for dementia. It is not designed to provide a thorough account of a person’s cognitive functioning and lacks capacity to identify focal cognitive difficulties (Fichter, Koniarczyk, & Greifenhagen, 1996). In one study, the MMSE detected less than half of the participants identified as having cognitive difficulties by a detailed
neuropsychological assessment (Bremner, et al., 1996). However, detailed assessments such as the Wechsler Adult Intelligence Scale (WAIS) (Wechsler, 2014) can be time-consuming, which poses difficulties when assessing individuals whose living circumstances can change quickly. Measures need to be sufficiently informative with minimal time burden.

Another significant issue affecting both research and intervention is the lack of use of validated traumatic brain injury (TBI) screening tools. TBIs are a leading cause of cognitive impairment with a high prevalence in homelessness (Topolovec-vranic et al., 2012). As such any exploration of cognitive functioning and homelessness needs to assess for potential TBI. However, studies often use a single self-report question such as “have you ever had an injury to the head which knocked you out or at least left dazed, confused, or disorientated?” (Mackelprang et al., 2014, To et al., 2015). This can underreport TBIs by up to 20% (Diamond, Harzke, Magaletta, Cummins, & Frankowski, 2007). While standardised tools are certainly more reliable than a single question, their identification of a TBI can be supported objectively by information from an individual’s health records which can provide valuable corroborating details (McMillan et al., 2014, Svoboda and Ramsay, 2013). Another methodological weakness present in the research is the lack of a representative sample. Participants are often derived from single recruitment sites such as long-term homelessness units (Topolovec-Vranic et al., 2014) which can have a negative impact on the generalisability of results.

Current Study

The aims of the current study were as follows:

1. To identify participants in the sample who experienced a brain injury and cognitive impairment (based on data from the BISI, medical records, and RBANS).
2. To report co-morbidity in the sample with regards to mental health issues and alcohol/substance misuse (based on data from the self-report questionnaire).

3. To report the services used by participants (based on data from the self-report questionnaire).

4. To report on the applicability methodology employed in conducting the study.

**Method**

**Community Consultation**

To inform the research procedure and participant materials, the Chief Investigator (CI) consulted with a local service-user group led by individuals with lived-experience of homelessness. Professionals working in the field including a commissioner from the local clinical commissioning group were also in attendance. The group reviewed all participant materials advising that they were appropriate for research with this sample. They advised that recruitment would be challenging so reducing the number of barriers to participation would help in this regard. They recommended promoting the project and completing data collection in multiple services across the city. In particular, they recommended services in which people are based throughout the day. They also strongly advised that data collection should be completed in a single session with minimal time burden.

**Design**

The study was cross-sectional in design and applied a quantitative methodology. It was granted ethical approval by the Liverpool Central NHS Research/NW/Ethics Committee and Health Research Authority, IRAS reference 230238; REC reference 17/NW/0509. The protocol,
study measures, and participant documents are in the ethics section of this thesis (see the Appendices of the Research Protocol). In line with the consultation, participants were recruited from several homelessness services in a large city in the northwest of the UK. This included a general practice (GP) with a dedicated homelessness clinic; a large accommodation service supporting individuals on both a short and long-term basis; and two homelessness day services in the city centre which provide meals, showers, activities, and act as gateways to support.

**Recruitment**

Participants were recruited through a number of methods. Firstly, a poster for the study (see the appendices of the study protocol in the ethics section) was advertised in communal areas at the recruitment venues. It outlined that the study was seeking to explore the thinking skills of people experiencing homelessness. As per the poster, participants could make contact with the CI directly via phone, email, or in person at designated drop-in times. Alternatively, they could inform a member of staff that they were interested in learning more about the study. Staff then contacted the CI to organise a meeting with potential participants. Staff also informed individuals at the recruitment venues about the study and, if they expressed an interested in participating, the CI would make contact.

A neuropsychological service supporting individuals experiencing homelessness was based across the recruitment venues. It is managed by a member of the study’s supervision team (Dr Weatherhead) and the CI was on placement with the service as part of their training in clinical psychology. The measures employed in this study were also used in the service's screening process. Consequently, and in line with ethical approval, the service made individuals it screened aware of the study (via the information sheet) so they could decide whether to include relevant assessment information in the study. If service-users chose to participate, the CI or a
member of the supervision team supported them to complete the consent form. Two participants were recruited in this manner.

**Inclusion & Exclusion Criteria**

The primary inclusion criteria outlined that participants must be at least 18 years old and currently experiencing homelessness. Informed by previous research, participants were considered to be experiencing homelessness if they had been sleeping rough, living at a hostel within the last seven days, or do not have a home of their own (Hwang et al., 2008). In order to participate, individuals were required to provide voluntary informed consent. This was accomplished using the information sheet and consent form (see the appendices of the research protocol in the ethics section for all participant documents). Participants must have had capacity to consent and continue in the assessment. Capacity assessment was informed by guidance provided by the British Psychological Society (2006) and the framework developed by Church and Watts (2007). Capacity was assessed and monitored by the CI throughout data collection. In order to review medical records, participants needed to have been registered with the GP, mentioned above. An assessment report was prepared for each participant which could then be shared with their GP. If unmet needs were identified during data collection, the participant was signposted (with consent) to an appropriate service such as the homelessness neuropsychological service described above. If it was unclear which service was appropriate, the CI liaised with the participant’s GP.

**Measures**

The measures described below, with the exception of the RBANS, can be reviewed in the ethics section of this thesis (see appendices of the research protocol).
Cognitive Functioning. The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) was employed to assess cognitive functioning along the following domains: immediate/delayed memory, attention, language, and visuospatial/constructional skills (Randolph, Tierney, Mohr, & Chase, 1998). It provides an index score for each subscale and an overall score. These can be compared to population norms indicating how participants scored compared to a sample of people of their age. Scores two SD below the norm are considered indicative of the impaired range. It can be applied in a single session (approximately 30 minutes) and is a measure of neurocognitive functioning used internationally in neuropsychological services.

Brain Injury History. The Brain Injury Screening Index (BISI) is a structured tool for screening individuals for TBI. It takes approximately ten minutes to administer. The most up-to-date version of the BISI is available from The Disabilities Trust foundation website: http://www.thedtgroup.org/foundation/about-the-foundation/brain-injury-screening-index.aspx. It has been validated with a number of different groups including prisoners (Pitman, Haddlesey, Ramos, Oddy, & Fortescue, 2014), a population which is similar to those experiencing homelessness. The BISI screens for both TBI and other acquired brain injuries (ABIs). It was developed based on questions used in earlier prevalence studies (Hwang et al., 2008, Williams et al., 2010). Items focus on whether individuals have experienced serious blows to their head, their effect, the treatment they sought, and questions relating to issues such as ADHD and learning disabilities. Participants can receive an outcome of no TBI, mild TBI, or moderate to severe TBI. Participants received a positive screen for an ABI if they responded positively to the item regarding having ever had a brain illness. Following consultation with frontline practitioners, for
the purpose of the present study, the BISI was supplemented to include items regarding dementia and alcohol/substance related BI (see ethics section).

**Health/Wellbeing/Service Use.** This questionnaire is an adapted form of the outcome measure used by the Healthy Futures initiative, a project to improve hospital discharges for those experiencing homelessness (Dervio Housing Trust, 2016). The questionnaire requests information on the following areas relating to the past year including: attendance at health services, interaction with police, substance use, duration of homelessness, and mental health difficulties. It also includes the Oxford Capability Questionnaire-Mental Health OxCAP-MH (Simon et al., 2013), which is a multi-dimensional measure of capability devised and operationalised to focus on the ability to engage in valued activities. The OxCAP-MH has significant correlation with similar measures including the Global Assessment of Functioning (GAF) (Pedersen, Urnes, Hummelen, Wilberg, & Kvarstein, 2018), EQ-5D-3L, and EQ-5D VAS (Euroqol Group, 1990) scales (correlation = 0.249, 0.415, and 0.514 respectively) (Simon et al., 2013). It provides an overall index figure (max 80) with higher scores indicating better capabilities.

**Health Records** Consent was requested to review participants’ health records to identify admissions for a TBI. This adds independent verification to the self-report data and can identify TBIs that participants may have overlooked. Reviews were conducted by the CI at the dedicated homelessness GP at which the majority of participants were registered. For those not registered at the GP the CI sought to contact the participants’ GP to review their records. However, this was largely unsuccessful.
**Data Collection**

Data collection sessions took place in a private, quiet room at the recruitment venues or another service convenient to the participant. The data (except the medical record review) for ten participants were collected in a single session each lasting approximately one hour. For the remaining participants, data collection was spread across several sessions for issues such as fatigue. The assessment was administered in the following order: the RBANS, the BISI, and the health & service-use questionnaire. Health records were reviewed for admission for a head injury at a later date if consent was provided. Health records were accessed using a secure computer at the participating GP service.

**Data Analysis**

All analysis was conducted using the Statistical Package for Social Sciences (SPSS). The aim of analysis was to compile a neuropsychological profile of a sample of people experiencing homelessness and their use of services. The study also sought to explore whether relationships existed between the different aspects of this profile, however as the assumptions for using parametric tests were not met (data were not normally distributed), non-parametric tests were employed as appropriate.

**Results**

**INSERT TABLE 1**

**Participants**

Table 1 presents the characteristics and key variables for each participant, the variables will be discussed in the relevant sections below. A total of 24 participants expressed interest in participating in the study. Six of these decided not to participate (two female, four male), and
another male was unable to complete the assessment due to significant mental health issues. One participant completed the RBANS but not the remaining measures due to feeling unwell. The individuals who declined did not always want to give a reason, when they did it was often due to them having more pressing needs. This gives an insight into the challenges associated with conducting research with people experiencing multiple complex needs.

In total there were full data for 16 participants and RBANS data for 17. The age range was 25 to 69 years old [M= 46; SD= 10.98]. The majority of participants were male (15/17; 88%), White (16/17; 94%), identified as heterosexual (16/17; 94%), and were born in the UK (14/17; 82%). Only two participants were born outside of the UK (South Africa and Eastern Europe) with one participant being unsure of their country of birth. One participant identified themselves as bisexual. The average number of years spent in education was 10.93 [SD= 1.639] with only two participants reporting that they continued schooling beyond their GCSEs (or equivalent).

Table two presents participants’ different sleeping venues in days for the previous year. The average age participants first experienced homelessness was 29.13 years old [SD = 11.28] (ranging from 15 to 52 years). Lifetime homelessness ranged from one to thirty years, with an average of 9.79 years [SD: 8.97]. There was a wide range of different sleeping circumstances. The most frequently used venue was a hostel, used by 15/16 (88%) participants. Participants stayed in hostels on average 169 nights [SD = 146.87] each in the previous year. Sleeping “rough” was the next most common situation with an average of 54 days [SD = 95.74] followed by sleeping in own social tenancy averaging at 32 days [SD = 72.22]. As observed in table two, one participant each stayed in a care-home (275 nights), prison (137 nights), and own social tenancy (330 nights).

INSERT TABLE 2
Wellbeing was measured using the OxCAP-MH (Simon et al., 2013) which, produces an overall score out of 80, with higher scores indicating greater reported capability. The average score was 46 out of 80, ranging from the lowest of 19 to a high of 63. The lowest level of capability reported related to a lack of access to employment or interesting activities. 69% (11/16) of participants disagreed that these activities were accessible to them. Next, 63% (10/16) of participants reported that their daily activities were limited by their health most or all of the time. Similarly, 56% (9/16) reported losing sleep over worry. Conversely, 75% (12/16) of participants reported that they had the freedom to express their views, enjoy nature (10/16; 63%), and use their imagination (9/16; 56%).

**Cognitive Functioning & Brain Injury**

Table three displays individual participants’ RBANS scores, TBI screening outcome, and reported MH issues. Based on normative samples matched with age, the majority of participants would be expected to score within a standard deviation above or below the norm of 100 (i.e. 85-115) (Randolph et al., 1998). Central tendency indicators for each domain and the overall score are displayed in Figure 1. As expected, these were lower than the population norms across all cognitive domains. The median total scale score representing overall cognitive ability was 59. Participants performed lowest on the attention [M = 61.53; SD = 16.32] and delayed memory [M = 66.06; SD = 20.64] subtests. The highest scores were in the language [M = 82.35; SD = 14.43] and visuospatial/constructional [M = 73.41; SD = 20.81] domains. Apart from three participants who scored 90, 101, and 108, the remaining 14 participants’ overall cognitive score fell between 47 and 68 – at least two standard deviations below the population norm. Therefore 14 (82%) participants scored in the category of cognitive impairment.

INSERT TABLE 3
Table four presents the frequency, mechanism, and timing of participants’ TBIs. Sixteen participants completed the BISI. Two (12.5%) had a negative TBI screen, four (25%) screened positive for a mild TBI, and ten (62.5%) for a moderate to severe TBI – thus a total of 14/16 participants had a positive screen for a TBI. Eleven (79%) of these participants reported that their TBI occurred prior to their first experience of homelessness. The average age for participants’ first TBI was 20.33 years old [SD = 11.02], the youngest age was 6 years old and, the oldest was 50 years old. The primary mechanism of injury was being a victim of assault which accounted for 22 out of a total of 40 TBIs (52%), followed by falls (8 – 19%), and road traffic accidents (RTAs) (5 – 12%). For those with a positive screen for a TBI, the average number experienced was 2.66. Participants also reported that nearly half of their TBIs occurred over 20 years ago (19/40), followed by a quarter 1-5 years ago (10/40), with the remaining split between 11-20 years (7/40) and 6-10 years (4/40). The “20+ years” category was the most reported period for TBIs to be incurred, particularly for participants’ first and second TBIs. Later injuries were more likely to have occurred in the previous five years. Thus the most common first, second, and third TBIs occurred at least twenty years ago, prior to the loss of housing, as a victim of assault.

Medical notes were available for 11 participants. Figure 2 displays a comparison between these and those identified by the BISI. A review by the CI for admissions or treatment for a BI indicated that four participants did not have any record of a BI, four participants’ records indicated a mild head injury (36%), while three (27%) indicated a moderate to severe TBI. This demonstrated that 63% of these participants (7/11) had experienced at least a mild head injury based on their medical records. As expected there was a lower rate of TBI identified in medical
records. This highlights the difference between TBIs experienced by this population and those for which medical treatment is sought however, the severe TBIs reported by participants via the BISI were also recorded in their medical records.

INSERT FIGURE 2

Previous research (Andersen et al., 2014) indicates significantly lower attention scores on the RBANS for individuals with a positive screen for a TBI versus those without. While not significant there was also a trend for memory to be lower. Consequently, in the current study, RBANS data (for attention, memory and overall score) were converted to categorical variables so that Fisher’s exact test could be employed (due to the small sample size) to compare the presence/absence of cognitive impairment across these domains with positive/negative TBI screen (both according to BISI outcome and medical records outcome). No significant effects were found in the current study. When BISI outcome was used the results were as follows: Attention (p = 0.9999, Fisher’s exact test); immediate memory (p = 0.9999, Fisher’s exact test); delayed memory (p = 0.9999, Fisher’s exact test) and overall RBANS score (p = 0.9999, Fisher’s exact test). When medical record outcome was used the results were as follows: Attention (p = 0.236, Fisher’s exact test); immediate memory (p = 0.236, Fisher’s exact test); delayed memory (p = 0.491, Fisher’s exact test) and overall RBANS score (p = 0.491, Fisher’s exact test).

Co-morbidity: Mental/Physical Health, Alcohol & Substance Use

As observed in Table one, MH difficulties were common in the sample with 14 of 16 (87.5%) participants who completed the questionnaire reporting difficulties. The open ended question querying mental health reported a variety of different issues. Seven (44%) participants highlighted experiences of anxiety or depression, two detailed alcohol problems, two were coping with bereavements, two had a diagnosis of schizophrenia with one also citing loneliness as the
source of their difficulties. Disabilities were similarly common with eleven (69%) participants identifying as having a disability. Physical disabilities were the most prevalent, reported by ten participants 63% of participants, while three participants reported some form of cognitive disability (19%). Together these indicate high levels of both mental and physical difficulties in the sample.

Data regarding substance use were collected using the adapted questionnaire. The substances used most by participants were crack cocaine and cannabis. These were each used by 69% of participants, followed by smoking heroin at 56% (9/16). Injecting heroin (44% -7) and cocaine (38% -6) were the next most frequently used substances. The drug Mephadrone was the least used, with only a single participant using in the past year. Smoking cocaine (5.5 years), heroin (5.13 years), and, cannabis (4.94 years) had the longest average usage in terms of years. Despite five participants reporting using it and the media attention it attracts, spice, the synthetic substance mimicking the effects of cannabis, was never used for more than year. Four participants were in receipt of methadone for the treatment of heroin addiction. The preferred medium for substance use was smoking compared to injecting. 69% of participants reported drinking alcohol in the past 30 days (11/16) with alcohol being consumed on an average of 16.81 days [SD = 13.348] in the last 30. Six of these participants reported drinking every day while only one consumed alcohol for less than 20 days.

Service Use

Table five illustrates participants’ use of services. There was high access rates for acute services, namely A&E, with 81% of participants (13/16) attending in the previous year (one participant did not complete the service-use questionnaire). While it was used on average 7.94 times by participants in the past year [SD = 20.48], there was a wide disparity in terms of frequency
of attendance. One participant who used A&E 84 times, accounted for 66% of total attendance, with the top four attenders accounting for 84% of the 127 attendances reported in the previous year. The small sample size limited the ability to identify patterns in service-use. However, some commonalities could be highlighted. Three of the four high attenders had active alcohol misuse problems drinking a minimum of 21 out of the previous 30 days, while the fourth had past alcohol misuse difficulties. Three had a positive BISI screen for moderate/severe brain injury, three reported they were coping with mental health issues, and two reported experiencing both. All four had cognitive scores in the region of impairment. These results suggest it is an interaction between these multiple needs, in the context of barriers to specialist care that contribute to the high attendance at A&E.

INSERT TABLE 5

Conversely, secondary services were rarely accessed by participants. Only four participants reported receiving support from a mental health (MH) service. Frequency of attendance at all MH services was low: MH hospital [Mean = 0.13; Standard Deviation = .50], MH community service [M = 1.38; SD = 3.384], and MH day service [M = 0.63, SD = 2.5]. In spite of the high reported injuries and cognitive difficulties, no participants had attended a specialist brain injury service in the previous year. Only two participants had attended an outpatient hospital clinics. Drug and alcohol services were accessed in greater numbers with nine participants (56%) having at least one contact. Participants also had more frequent interactions with drug and alcohol services, attending on average 4.94 [SD = 6.962] individual sessions, and 11.25 [SD = 45.00] group sessions in the past year.

With regards to interaction with the justice system, a similar pattern as A&E use was observed, with a small number of participants having a high number of arrests. Although six
participants (38%) had been arrested on average 1.63 [SD = 3.18] times, two individuals accounted for 73% (17/26) of arrests. Both had high levels of alcohol consumption, a history of long-term substance difficulties, positive screenings for moderate/severe brain injury, and cognitive scores in the impaired category (with an overall RBANS score of 48, one had the lowest result in the sample).

**Methodology Applicability**

The cognitive assessment and other measures employed were tolerated well by participants. All participants completed the RBANS and only one did not finish the remaining measures due to illness. All participants consented to their medical records being accessed for the purpose of the study. However, unless they were registered with the participating homelessness GP practice, attempts to access the records proved unsuccessful.

The primary methodological issues which were encountered during the research included the additional time required for relationship building, and issues related to recruiting a representative sample. In order to collect data, the CI frequently met with potential participants on several occasions prior to their taking part, if indeed they did. While this was an essential component to support the involvement of many of the participants the time investment likely impacted sample size. Relatedly, recruitment was often reliant on the relationships and knowledge of frontline staff. This was invaluable in supporting individuals to participate however, it may have had an impact on the sample characteristics which will be discussed below. Similarly, the barriers existing for individuals experiencing homelessness to access the services from which the sample was recruited may have also affected the participant profile.
Discussion

The aim of this study was to explore cognitive impairment, brain injuries, co-morbidity, and service-use in a sample of individuals experiencing homelessness and to discuss the applicability of the methodology employed. This investigation was guided by research reporting high levels of TBI (McMillan et al., 2014; Topolovec-Vranic et al., 2012), MH issues (Fazel et al., 2008, Nielsen, Hjorthoj, Erlangsen, & Nordentoft, 2011), cognitive impairment (Burra et al., 2009; Depp et al., 2015; Spence et al., 2004), and their co-occurrence (Gargaro, Gerber, & Nir, 2016) in homelessness compared to the general population.

Cognitive Functioning

The median overall cognitive score was 59 and fourteen (82%) participants met the criteria for impairment. The only other study that employed the RBANS with this population reported an overall average of 81 (Andersen et al., 2014). However, the study’s larger sample consisted of 12 positive screens for a TBI out of 32 participants. These positive screens had a lower average score of 77. The current sample had 14 (87.5%) positive screens for a TBI out of 16 participants. There was also a higher rate of co-occurring MH difficulties in the current sample than in Andersen et al.’s (2014) study which may have impacted cognitive functioning.

Both studies reported that participants performed poorly on attention and memory domains. Although considered relatively basic cognitive functions, they are fundamental to daily functioning. Attention is required for the encoding of new memories and is integral to learning. Moreover, “higher” cognitive processes, such as executive functioning, are to some degree rooted in these “lower” functions (Arciniegas, Held, & Wagner, 2002). These can cause difficulties with activities such as learning coping strategies and remembering appointment details for multiple service-providers. This indicates how cognitive impairment can hinder a person’s ability to exit
homelessness and contribute to them remaining stuck in a cycle of increasing need without proper intervention.

In line with previous literature (Hwang et al., 2008), there was a higher proportion of TBI in the sample compared to the general population. The BISI responses indicated that 14 out of 16 participants experienced a TBI, 11 of which were moderate-severe. In the 11 participants for whom medical records were available, seven participants had received treatment for a TBI, three of which were moderate-severe. This homelessness study is the first in the UK to collect TBI data using both a validated screening tool, and medical records. As observed previously (Barnes et al., 2015, Russell et al., 2013, Svoboda & Ramsay, 2013), the self-report data indicated a higher proportion of TBI than medical records. Due to the small sample, making population comparisons was not feasible. Although screening for TBI can produce false-positives (Iverson, 2010), the difference between the two measures suggests many participants did not receive treatment for TBIs incurred. This points to a key issue in the area: Individuals experiencing homelessness not only have a high likelihood of incurring a TBI; their injuries do not seem to receive the appropriate support. Consequently, the neuropsychological needs caused by the TBI go unaddressed.

The causes of TBIs in the sample reflected that expected in the general population, (e.g. road traffic accidents, falls, and, assaults) (Topolovec-Vranic et al., 2014). This is understandable considering that the majority of participants (13/16 - 80%) experienced their first TBI prior to homelessness. However, assaults accounting for half of TBIs indicates the highly challenging circumstances experienced by this group before and during homelessness. Barnes et al. (2015) proposed a bi-directional model for the link between homelessness and TBI. They suggest TBI increases the risk for experiencing homelessness, while homelessness consists of unique risk factors for TBI. Therefore once individuals lose their home, the increased exposure to risk-taking
behaviour in addition to having already experienced a TBI, significantly increases the chance of further TBIs.

Due to the cross-sectional nature of this and many other studies exploring the issue, the temporal relationship between TBI and homelessness cannot be confirmed. However the results are consistent with previous research suggesting that TBI may be a risk factor for homelessness (e.g. Topolovec-Vranic et al., 2012). While not a focus of the study, it is also possible that participants were experiencing cognitive impairment consequential to long-term heavy alcohol use however, the data were not available to confirm whether participants consumed alcohol at a high enough rate for a sufficient amount of time to constitute alcohol-related brain injury (ARBI). As there is little recognition of the cognitive impairment associated with ARBI in this population, future research would help highlight the extent of the associated need (Brighton et al., 2013) and support the development of effective services.

**Co-morbidity: Mental/Physical Health, Substance misuse**

Reflecting previous research, 87.5% (14/16 participants) of the sample reported that they experienced mental health (MH) difficulties while 63% (10/16 participants) reported some form of physical disability. Substance use was reported by the majority of participants with alcohol, crack cocaine and cannabis being the most used. The combination of these issues indicate the multiple needs experienced by this population in addition to cognitive impairment. Converging evidence suggests an association between cognitive impairment and a wide range of MH issues (Weiser et al., 2004) including affective disorders (Ratnatunga et al., 2017), and substance misuse (Bolla, Funderburk, & Cadet 2000). A number of explanations for this link have been proposed including: MH issues cause anxiety in test situations impairing performance (Mathews, May, Mogg, & Eysenck, 1990); or cognitive impairment causes difficulties with social cognition.
impacting relationships and attracting a psychiatric diagnosis (Chisholm & Strayer, 1995). A prominent explanation outlines that the association between emotional and cognitive difficulties indicates a shared brain dysfunction, with building evidence implicating disruption of a cognitive control network (McTeague, Goodkind, & Etkin, 2016). Future research could benefit from exploring the relationship between the cognitive impairment observed in this population and the multiple co-morbidity issues which can affect cognition.

**Service Use**

The barriers facing people experiencing homelessness when accessing services are significant (Hwang, 2001, Stergiopoulos et al., 2010, Argintaru et al., 2013). Despite the need presented by TBIs and MH issues, only a minority of the sample received support from a MH service, while no participants had interactions with a brain injury service. A number of factors could have played a role in this situation. The traditional model whereby clients attend appointments at a clinic is appropriate for the general population. However, it can be a barrier to support for individuals experiencing homelessness and the associated complex needs highlighted in the current study. One possible consequence of this involves individuals using the most accessible service, A&E, which is not designed to manage long-term physical and MH issues. This high cost intervention can support the person in crisis to an extent, but does not provide the same level of support as specialist services. The high mean use of acute services (e.g. A&E) may also reflect the prevalence of MH issues, long-term physical health problems (e.g. physical disabilities and brain injuries), and long-term homelessness in the sample which, in turn have a strong association with higher health care costs (Zaretzky, Flatau, Spicer, Conroy, & Burns, 2017). The needs associated with the experience of TBI in homelessness are only now growing in awareness.
(Topolovec-Vranic et al., 2012). When presenting at services, it is possible these needs may be misperceived as a result of other issues such as alcohol misuse which are more widely recognized.

In the current study while participants did not have a permanent address, the majority were accommodated by hostels. Integrating specialist care into these locations may help to reduce structural barriers, promote collaboration between health and homelessness services, and reduce the reliance on A&E. While there is not yet ample evidence to judge the effectiveness of such models, recent findings comparing two shelter-based collaborative care models for MH in Canada have been promising (Stergiopoulos et al., 2015b). Improvements were observed in community functioning, hospitalisations, A&E visits, and residential stability.

**Methodology Applicability**

The current study sought to address a number of key issues affecting field research into homelessness and cognition. In recognition of the multiple complex difficulties faced by participants, investigators must negotiate a balance between pragmatics and robustness. Firstly, the use of the RBANS sought to collect more comprehensive cognitive data than more widely used screening tools, without putting excessive demand on participants. There were limitations in using the RBANS. It was developed for use in the detection of dementia and has been criticized for its lack of executive functioning assessment (Dong et al., 2013; Garcia, Leahy, Corradi, & Forchetti, 2008) however, it has shown applicability in the context of TBI (Lippa, Hawes, Jokic, & Caroselli, 2013). Importantly, in the current study each participant successfully completed the measure in one session. While there are more robust instruments, they are often much lengthier with the WAIS-IV (Wechsler, 2004) taking approximately 60-90 minutes to administer. The community consultation advised for data collection to be as brief as possible hence, combined with the other measures, a more comprehensive test is likely to have been unfeasible. Several
participants required multiple sessions to complete the BISI and questionnaire. For one participant it was not possible to collect further data following completion of the RBANS, in the case of the lengthier WAIS-IV this may have resulted in incomplete cognitive data. Future studies may benefit from combining different tests which are more robust than the RBANS, but remain brief to administer, rather than a single packaged neuropsychological assessment.

The combination of medical records and the BISI sought to provide a structured and reliable approach for identifying possible brain injuries which had been absent in many studies (some just used a single question). While the BISI responses were reliant on memory, participants reported that the structured measure supported them to remember injuries they had not considered as having any consequences, despite them being significant TBIs. The medical records provided objective accounts of brain injuries and all participants consented to them being accessed for the purpose of the study. However, records were only available for eleven participants. These were all patients with the participating GP practice. Despite multiple attempts, it was not possible to access the records of participants who were registered elsewhere. As such there were missing data for six participants. This dual approach for identifying brain injuries could be improved via the establishment of relationships with multiple GP practices who have high numbers of patients living in temporary housing or with no fixed abode.

As observed above, homelessness research often relies on frontline support services to recruit participants. Data collection was often contingent on the establishment of trust with service-users prior to participation. It was necessary to dedicate time to develop relationships with potential participants (and staff) prior to individuals taking part in the study. Building these relationships was an essential part of the research methodology that required considerable time investment. Many participants only took part after rapport had been built over the course of
several months. Having a familiar and friendly presence perhaps reduced the perception of threat posed by a MH professional assessing cognitive functioning. This was further supported by keyworkers and staff with established relationships with participants. An area for future exploration would be further developing this approach to support the participation of those who did not take part in the current study. For example, supporting individuals who experience barriers in accessing services to participate in research. While the current methodology sought to achieve a representative sample by recruiting from different types of front-line services in a large city, key demographics were not represented, namely women and individuals from black and minority ethnic groups. Future studies may benefit from developing research teams based on the demographics of individuals experiencing homelessness to reduce the perception of difference or threat posed by the researcher. Minority groups are overrepresented in homelessness and the CI being white and male may have posed an additional barrier to the recruitment of individuals from these groups. Similarly, the inclusion of a female researcher may support female participation.

**Strengths & Limitations**

A common issue with research into homelessness, smaller sample sizes, is reflected in the current study (Topolovec-Vranic et al., 2012, Wooden et al., 2012). While they contain considerable detail on clinical variables they can have limited statistical power. Field research exploring homelessness requires the development of relationships with both the individuals affected and service-providers. As observed in the current study, individuals affected by homelessness have experienced multiple traumatic events accompanied by stigma and barriers to accessing appropriate support. Taking the time to develop a trusting relationship was key in helping participants feel comfortable enough to complete the neuropsychological assessment. As in the current study this requires a significant time investment which can affect sample size (this
will be discussed in greater detail in the Critical Appraisal section). Another prevalent issue of the field represented in this study is the use of cross-sectional designs. Preferably participants would be followed up longitudinally but pragmatically this is challenging as individuals’ sleeping circumstances can change quickly. This limits the time available for developing the relationships to support participation.

Selection bias may have affected the recruitment procedure. The poster indicated that the study was exploring “thinking skills” and refers to memory and attention. While service-users and staff were informed that individuals did not need to have difficulties to take part, those with concerns regarding their cognitive ability may have been more likely to have participated whether by their own volition or with staff support. However, such support may have led to the inclusion of participants who might otherwise not be involved in research. Also, this was a small, exploratory study which sought to highlight the neuropsychological needs of individuals experiencing homelessness. Although selection biases may have contributed to the proportion of issues observed, a key focus of this research was to explore whether participants were receiving support for neuropsychological needs. Consequently, the high level of cognitive difficulties observed supported the exploration of the relationship between these needs and support.

A key strength was conducting field research with a disadvantaged group with complex needs. There were wide inclusion criteria in order to reduce as many barriers as possible as advised by the community consultation. Seeking out the advice of individuals who had lived experience of homelessness provided the study with valuable insight regarding procedure and recruitment. This included recruiting participants from multiple services across the city in order foster a representative sample.
Implications & Future Research

This study highlights the neuropsychological needs in this population, namely cognitive difficulties and TBIs. Participants did not access specialist services suggesting barriers to care exist. Future research could explore the nature of these barriers and how they can be overcome. Although participants lacked a permanent home, there was high use of hostels and participants came into contact most frequently with homelessness services rather than health services. Research could explore the potential for collaboration between these different sectors in order to increase access to brain injury, MH, and other services. Such approaches have been observed in Liverpool and London with NeuroTriage and the Homeless Brain Injury Project.

The assessment procedure employed for data collection was tolerated well by participants and involved a relatively thorough profile of a persons’ brain injury history, cognition, service-use, and well-being. Apart from the RBANS, the measures require little training to administer and could support the development of tailored intervention. The methodology could be improved through the use of a combination of different cognitive tests which are more robust than the RBANS (but must remain brief) and a diverse research team which reflects the demographics of the homelessness population.

Conclusions

This study supported previous research indicating multiple vulnerabilities in those individuals experiencing homelessness including brain injuries and cognitive impairment. In the previous year no participants had accessed specialist services for these issues, but had accessed supported accommodation, GPs, and A&E. The methodology employed, which negotiated a balance between robustness and pragmatics, key in homelessness field research, was tolerated well by participants. It addressed several of the existing issues in the field and informs how these
could be further improved upon. Future research could build upon this study’s methodology to further explore the neuropsychological issues associated with homelessness and how best to support them.
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Topolovec-Vranic, J., Ennis, N., Colantonio, A., Cusimano Michael, D., Hwang Stephen, W.,


DOI: 10.1080/02673037.2017.1280777
## Figures & Tables

### Table 1
Demographic details for participants

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<th>Ethnicity</th>
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<th>TBI (BISI)</th>
<th>Cog. Total</th>
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## HOMELESSNESS AND COGNITION

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**Notes**: Missing Data is indicated by (-). Yrs. F/T Ed = Years in Full-time Education; QoL = Score on Oxford Capability Mental Health Scale; Cog. Total = Overall Cognitive Score on the RBANS; Figures for A&E and Arrests are for attendances/arrests in the previous year. Alcohol figure represents the number of days in the previous 30 alcohol was consumed; and Crack (yrs.) figure represents the total number of years the crack cocaine has been used.
Table 2

Details of participants’ history of homelessness in terms of days spent in the previous year in different sleeping circumstances.

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*Note.* Missing Data is indicated by (-).
Table 3

Individual details of participants’ cognitive functioning (RBANS), traumatic brain injury (TBI) history, and mental health (MH) issues.

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*Note.* Missing Data is indicated by (-).
Figure 1

*Indicators of central tendency for participant cognitive scores (RBANS) compared to population norms.*

>Note: Mean is provided for all domains except for those marked with an asterisks which refer to the median.*
### Table 4

Details of the frequency, mechanism, and timing of participants’ TBIs

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*Note. Missing Data is indicated by (-). Mech.(yrs ago)* = Mechanism of injury (TBI incurred X number of years ago).
Figure 2

*Comparison of TBIs identified by the BISI and medical notes*
Table 5

Frequency of participant interactions with different services for the previous year

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Chapter 3 Critical Appraisal

Cormac Duffy
Trainee Clinical Psychologist
Division of Health Research

Word count: 2602 (excluding references)
This critical appraisal will explore the ethical and methodological issues encountered while conducting research with people experiencing homelessness (in the context of brain injury research). Homelessness is accompanied by significant barriers to accessing healthcare and other services (Hwang, 2001). This can lead to individuals lacking the specialist support required for issues such as mental health or cognitive difficulties (Stergiopoulos, Dewa, Durbin, Chau, & Svoboda, 2010; Stergiopoulos et al., 2015b), thus contributing to the high level of unmet needs in those affected (Argintaru et al., 2013; Forrester, Weatherhead, Rosebert, Hewett, & Worthington, 2017). The study outlined in this thesis, sought to explore neuropsychological difficulties and service use in this population, in order to increase understanding of how best to address any of the unmet needs that have been identified. The study highlighted that individuals with high levels of cognitive difficulties, brain injury, and mental health issues did not typically access the specialist services available. Instead, there was a tendency to attend relatively high-cost services, namely Accident and Emergency (A&E). This suggests that there may be barriers in place which make it difficult for individuals to access specialist support. The Chief Investigator (CI), and research supervision team, sought to embed values of inclusion in the research protocol to avoid similar barriers to participation. These and other issues posed by participants’ unmet needs will form the main discussion of this paper.

When people lose their home, they experience significant difficulties in accessing support (Belcher and Deforge, 2012). As the focus of this study was unmet neuropsychological needs, these will be used to demonstrate the barriers faced in homelessness. The memory problems associated with an acquired brain injury (ABI), can pose problems for all users of mainstream neuropsychological services such as missing appointments. However, the substantial mental and physical health issues prevalent in homelessness (Martens, 2001), coupled with a lack of social
support, can increase the likelihood of those experiencing homelessness missing appointments. This can result in this population being discharged from services without receiving appropriate help (Forrester et al., 2017). While the lack of a fixed abode makes it difficult to receive appointment letters, the requirement to travel to a clinic, in the context of multiple complex needs, places a high demand on individuals. Those who are housed in temporary accommodation, such as a hostel, may have access to some additional support to attend appointments. However, this support can be inconsistent and subject to staffing levels or other financial considerations (e.g. transport costs). Drugs and alcohol are often used by those affected by homelessness in an attempt to manage the emotionally difficult experiences associated with the daily challenges of homelessness and early adverse experiences such as trauma (which are commonly experienced in this population) (Collins et al., 2018). However, neuropsychological services can require addiction issues to be resolved prior to receiving specialist support. While there are difficulties in delivering neuropsychological interventions to those using substances, in declining such referrals the individual is left without the support they require and an experience which is likely to increase the barriers in the future.

These issues are also relevant for research with this population and were considered carefully in the design of the current research. As such, it was paramount that efforts were made to avoid replicating the exclusion faced by this group in the study. A failure to consider these issues would be contrary to the values of the study. To this end, I met with stakeholders including, people with lived experience of homelessness, specialist doctors, nurses, and staff at different homelessness services, to seek advice on how best to remove barriers to participation. Their feedback, particularly from the lived-experience group, was key to the development of the study. This reflects the wealth of valuable knowledge held by those with first-hand experience of
such difficulties. I met with a local service-user representative group twice to seek their advice and subsequently, attended several meetings to keep them updated on the study. However, there could have been greater service-user involvement across other aspects of the study. For example, conducting an assessment with a member of the group could have provided further insight into how participants might experience the process, and possible adaptations required. From my perspective, the inclusion of those with lived-experience in research, and clinical practice, is a continuous process that requires monitoring and improving upon, to ensure the value of their contributions are recognised and rewarded appropriately. Whilst there was no reward for their consultation on this study, I successfully applied for funds to be used to organise an event, such as communal meal, for all individuals involved in the study.

As with accessing support services, travelling to participate in the current study could have been a barrier. To facilitate participation the researcher travelled to meet participants at locations and times convenient to them (within reason and following lone worker policies). Furthermore, it was not uncommon for participants to forget about the appointment. On other occasions participants were feeling too tired or unwell to participate at that time. I would always reassure individuals that participation was voluntary, and advised that if they still wanted to take part, interviews could be rescheduled.

Another, possibly contentious issue, was the inclusion of individuals who may have been under the influence of alcohol or another substance on the day they were due to participate in the study. This presented several ethical dilemmas. Firstly, if a person experiences long-term alcohol/substance use, to the extent that it is challenging and medically dangerous to abstain completely for the assessment, it could be argued that the cognitive effect of these substances is representative of their baseline functioning. Requiring individuals to resolve a long-term
difficulty in order to participate effectively eliminates a large section of those affected by homelessness. Estimates vary, but several studies report a substance misuse rate between 40-50% and alcohol misuse of approximately 60% in homelessness (Fitzpatrick, Bramley, & Johnsen, 2013; Glasser and Zywiak, 2003). Consequently, the sample recruited would be less representative and would likely paint an inaccurate picture of the neuropsychological needs associated with this population. However, this approach made it increasingly important to monitor capacity to consent to participation. While an individual did not need to be 100% alcohol and/or substance free they did need to be able to provide voluntary informed consent.

Prior to each data collection session commencing, I dedicated significant time to ensure participants understood all that was involved in the study, and potential consequences of participation. If there was any indication that a participant may be under the influence, I would assess and closely monitor the participant’s understanding of participation and ability to give consent.

This relates to another ethical issue inherent in this study: how to support participants following the identification of unmet needs? I was very conscious that data collection involved asking vulnerable individuals about potentially traumatic experiences in their lives. The study asked participants questions about mental health difficulties, traumatic brain injuries, substance use, and cognitive impairment in addition to other potentially distressing topics. It would be unethical to explore these experiences, and in the case of cognition perhaps reveal unknown difficulties, without providing a means for individuals to access appropriate support. The dual researcher/clinician role I held was a challenging aspect of the research process. This was particularly difficult when unmet needs were identified as there was no potential for me to offer further intervention. Being trained to support those experiencing distress, and having built a
rapport with participants, I felt a desire to offer more to participants than signposting. To help manage the emotional challenges presented, I explored these experiences in supervision with the field supervisor. Embedded in the consent form, was the option for participants to have the outcome of their assessment shared with both their GP and a local neuropsychological service developed to support individuals experiencing homelessness. An accessible report with recommendations was also compiled for each participant and their care team. This could then be followed up by a Brain Injury Link-worker whose role was to support individuals to access relevant statutory services.

Another issue, which was integral to working with this population, was the establishment of trust prior to data collection. Most individuals affected by homelessness have experienced significant hardships such as physical and sexual abuse, childhood trauma, institutional care, and many other adverse life events (Fitzpatrick et al., 2013). This can be accompanied by poor, distressing, or even damaging, experiences of professionals and authority figures (Martins, 2008). For example, homelessness services are not always adequately funded and frontline staff may not have the resources or training needed. This is despite the high number of service-users with multiple, complex, needs usually involving significant trauma. This can lead to issues such as inconsistency of approach and staff burnout which may repeat the problematic attachment experiences of individuals. Consequently, distrust of those in positions of power can be developed by individuals in this group as a survival mechanism. I needed to demonstrate a level of trustworthiness to service-users at the different recruitment venues. To this end, I attended community meetings and generally made myself available to speak with people in common areas across the services. Having a friendly, warm manner, and taking the time to sit alongside people to explain the project, played a big role in building rapport and reassuring individuals of the
merits of the study. These positive interactions supported subsequent recruitment as word of mouth spread about study.

What quickly became apparent during data collection, was the need people had for positive social interaction. Individuals frequently sought someone to speak with, even just to share recent experiences with, but more often past difficulties. Some individuals requested I meet with them, despite not wanting to participate. Demonstrating the extent of stigma, and exclusion present in their daily lives, several individuals queried why I would ever want to work in this area. I met with some participants several times, prior to participation, to help them feel relaxed and at ease before completing the assessment. Reflecting on these experiences highlighted the high level of unmet social needs in homelessness.

Responding appropriately and sensitively to frequent novel situations was challenging. As a clinician, I wanted to support individuals by making time to allow them to share their stories. However, this was not also sustainable or practical. In order to gather data, it was essential to outline and maintain the boundaries of my role at recruitment venues. This could be challenging as staff, recognising the need for psychological intervention with their service-users, could ask me to meet with particular individuals. These individuals did not always want or see the need to meet with a psychologist and again this was not my role. Consequently, it became a balancing act, between maintaining relationships with both staff and service-users while simultaneously collecting data. However, this raises an issue regarding the representativeness of the sample. Individuals considered to be in need of support may have been more likely to participate. Conversely, this may also have supported the inclusion of participants who might otherwise not be involved in research.
However, the small sample size already substantially limits the generalisability of results. The prevalence of cognitive difficulties (Burra, Stergiopoulos, & Rourke, 2009; Depp, Vella, Orff, & Twamley 2015; Spence, Stevens, & Parks, 2004), brain injuries (Topolovec-Vranic et al., 2012, McMillan et al., 2014, Hwang et al., 2008), mental health issues (Perry and Craig, 2015, Amore and Howden-Chapman, 2012), and substance use (Lougheed and Farrell, 2013, Collins et al., 2018, Fischer and Breakey, 1991) in homelessness have all been well established in previous research. The results of the current research generally reflect existing findings however, the link between these experiences and service use has yet to be thoroughly investigated. Exploration of this link, can identify whether individuals’ needs are being met appropriately, and increase understanding of how best to approach service provision for this population. Consequently, the greater the number of individuals with these experiences in the sample, the greater opportunity to explore the link between these and the services they use. The sample did lack female participants and ethnic diversity, with the majority of participants being white males. Despite the overrepresentation of minority ethnic groups in homelessness, this is not reflected in the users of support services. This suggests that for some, accessing support remains difficult and these barriers were present in the study recruitment procedure. As participants were recruited from different services, if individuals experienced difficulty accessing them, this would have a knock on effect on sample characteristics.

This discussion would not be complete without discussion of a participant who sadly passed away shortly after data collection. I had met with the individual three times in order to support them to participate. Across these sessions a rapport had been built which allowed the person to feel comfortable enough to complete the different measures. For this individual, there was a high number of unmet psychological and physical needs identified, and the person was
subsequently referred into the neuropsychological service. However, when I informed the accommodation service of this, they reported that the participant had been admitted to hospital and subsequently died. This was one of the most challenging experience of the thesis process. The study was developed to support those who had been excluded from mainstream services (and society). However, when it seemed like there was the possibility that an affected person could gain a better quality of life, they passed away. It was difficult not to think that the study (and CI) had become part of the system that I was hoping to help change. Feelings of guilt, failure, and sadness were experienced by myself and others involved in the participant’s care. To support those affected, reflective sessions were organised by the neuropsychological service mentioned. These were well received and provided staff with a space to express their feelings, and identify learnings from the situation.

The experience of conducting this research was both emotionally challenging and rewarding. Homelessness and unmet needs are phrases often seen in journals or other media. However, spending time with people with first hand experiences of this level of trauma, neglect, and exclusion in their lives had a powerful influence on my personal and professional values, as well as area of specialism. Working in this area, there is a momentous pull to give as much of oneself as possible, but in doing so, demands can quickly start to outweigh resources and the potential for burnout is significant. From working as part of a research team, and closely with services providers, it is evident that staff support is key in order to cope with the emotional demands involved. The positive effect observed by sitting with someone, and providing them with the space to share their story, was moving. Realising that such moments were a rarity in the individual’s life, meant that these experiences could have a tinge of sadness. It was difficult too not to feel angry at the inequalities and exclusion faced by those who were involved in the study.
However, these feelings also serve as exceptional motivators. They have made me more determined to pursue a career aiming to improve the wellbeing of people living on the fringes of society.

**Conclusion**

To conclude there were a number of barriers faced by this population that the study aimed to reduce. These included the requirement to attend a specific clinic and to be alcohol-free. However, barriers to participation affecting women and minority groups likely remained. Empirical investigation of their needs should be a core area for future researchers. Lastly, another issue in the thesis procedure, the dual researcher/clinician role, required considerable reflection and exploration to manage the regular challenges presented.
References

DOI: 10.1016/B978-0-08-047163-1.00336-2


DOI: 10.1080/10911359.2012.707941


DOI: 10.1177/0042098012452329


DOI: 10.1081/JA-120017385


DOI: 10.1111/j.1525-1446.2008.00726.x


DOI: 10.1089/neu.2014.3387


DOI: 10.1177/014107680409700804


DOI: 10.1186/s12913-015-1014-x

Ethics Proposal

Cormac Duffy
Trainee Clinical Psychologist
Division of Health Research

Word count: 4557 (excluding references, images and appendices)
NHS Ethics Application Form (IRAS)

Welcome to the integrated Research Application System

IRAS Project Filter

The Integrated dataset required for your project will be created from the answers you give to the following questions. The system will generate only those questions and sections which (a) apply to your study type and (b) are required by the bodies reviewing your study. Please ensure you answer all the questions before proceeding with your applications.

Please complete the questions in order. If you change the response to a question, please select 'Save' and review all the questions as your change may have affected subsequent questions.

Please enter a short title for this project (maximum 70 characters)
The neuropsychological needs of individuals experiencing homelessness

1. Is your project research?
   - Yes
   - No

2. Select one category from the list below:
   - Clinical trial of an investigational medicinal product
   - Clinical investigation or other study of a medical device
   - Combined trial of an investigational medicinal product and an investigational medical device
   - Other clinical trial to study a novel intervention or randomised clinical trial to compare interventions in clinical practice
   - Basic science study involving procedures with human participants
   - Study administering questionnaires/interviews for quantitative analysis, or using mixed quantitative/qualitative methodology
   - Study involving qualitative methods only
   - Study limited to working with human tissue samples (or other human biological samples) and data (specific project only)
   - Study limited to working with data (specific project only)
   - Research tissue bank
   - Research database

   If your work does not fit any of these categories, select the option below:
   - Other study

2a. Please answer the following question(s):

   a) Does the study involve the use of any ionising radiation?
      - Yes
      - No

   b) Will you be taking new human tissue samples (or other human biological samples)?
      - Yes
      - No

   c) Will you be using existing human tissue samples (or other human biological samples)?
      - Yes
      - No

3. In which countries of the UK will the research sites be located? (Tick all that apply)
   - [ ] England
   - [x] Scotland
3a. In which country of the UK will the lead NHS R&D office be located:

- ✔️ England
- 🗒 Scotland
- 🗒 Wales
- 🗒 Northern Ireland
- 🗒 This study does not involve the NHS

4. Which applications do you require?

**IMPORTANT:** If your project is taking place in the NHS and is led from England select ‘IRAS Form’. If your project is led from Northern Ireland, Scotland or Wales select ‘IH/SC Research and Development Offices’ and/or relevant Research Ethics Committee applications, as appropriate.

- ✔️ IRAS Form
- 🗒 Confidentiality Advisory Group (CAG)
- 🗒 Her Majesty’s Prison and Probation Service (HMPPS)

For NPS/HSC R&D Offices in Northern Ireland, Scotland and Wales the CI must create NHS/HSC Site Specific Information forms, for each site, in addition to the study wide forms, and transfer them to the FIs or local collaborators.

For participating NHS organisations in England different arrangements apply for the provision of site specific information. Refer to IRAS Help for more information.

Most research projects require review by a REC within the UK Health Departments’ Research Ethics Service. Is your study exempt from REC review?

- 🗒 Yes
- ✔️ No

6. Will any research sites in this study be NHS organisations?

- ✔️ Yes
- 🗒 No

5a. Are all the research costs and infrastructure costs (funding for the support and facilities needed to carry out research e.g. NHS Support costs) for this study provided by a NIHR Biomedical Research Centre, NIHR Biomedical Research Unit, NIHR Collaboration for Leadership in Health Research and Care (CLAHRC), NIHR Patient Safety Translational Research Centre or a Diagnostic Evidence Co-operative in all study sites?

Please see information button for further details.

- 🗒 Yes
- ✔️ No

**Please see information button for further details.**

5b. Do you wish to make an application for the study to be considered for NIHR Clinical Research Network (CRN) Support and inclusion in the NIHR Clinical Research Network Portfolio?

Please see information button for further details.

- 🗒 Yes
- ✔️ No
The NIHR Clinical Research Network provides researchers with the practical support they need to make clinical studies happen in the NHS e.g. by providing access to the people and facilities needed to carry out research "on the ground".

If you select yes to this question, you must complete a NIHR Clinical Research Network (CRN) Portfolio Application Form (PAF) immediately after completing this project filter question and before submitting other applications. Failing to complete the PAF ahead of other applications e.g. HRA Approval, may mean that you will be unable to access NIHR CRN Support for your study.

6. Do you plan to include any participants who are children?
   ☐ Yes  ☐ No

7. Do you plan at any stage of the project to undertake intrusive research involving adults lacking capacity to consent for themselves?
   ☐ Yes  ☐ No

Answer Yes if you plan to recruit living participants aged 16 or over who lack capacity, or to retain them in the study following loss of capacity. Intrusive research means any research with the living requiring consent in law. This includes use of identifiable tissue samples or personal information, except where application is being made to the Confidentiality Advisory Group to set aside the common law duty of confidence in England and Wales. Please consult the guidance notes for further information on the legal frameworks for research involving adults lacking capacity in the UK.

8. Do you plan to include any participants who are prisoners or young offenders in the custody of HM Prison Service or who are offenders supervised by the probation service in England or Wales?
   ☐ Yes  ☐ No

9. Is the study or any part of it being undertaken as an educational project?
   ☐ Yes  ☐ No

Please describe briefly the involvement of the student(s):
The student is completing the study as part of his doctorate in clinical psychology. They will be the Chief Investigator.

9a. Is the project being undertaken in part fulfilment of a PhD or other doctorate?
   ☐ Yes  ☐ No

10. Will this research be financially supported by the United States Department of Health and Human Services or any of its divisions, agencies or programs?
    ☐ Yes  ☐ No

11. Will identifiable patient data be accessed outside the care team without prior consent at any stage of the project (including identification of potential participants)?
    ☐ Yes  ☐ No
Integrated Research Application System
Application Form for Research administering questionnaires/interviews for quantitative analysis or mixed methodology study

The Chief Investigator should complete this form. Guidance on the questions is available wherever you see this symbol displayed. We recommend reading the guidance first. The complete guidance and a glossary are available by selecting Help.

Please define any terms or acronyms that might not be familiar to lay reviewers of the application.

Short title and version number: (maximum 70 characters - this will be inserted as header on all forms)
The neuropsychological needs of individuals experiencing homelessness

PART A: Core study information

1. ADMINISTRATIVE DETAILS

A1. Full title of the research:
An exploration of the neuropsychological needs of individuals experiencing homelessness

A2.1. Educational projects

Name and contact details of student(s):

Student 1

Title Forename/Initials Surname
Mr Cormac Duffy
Address
Apartment 2
11 Oldham Street
Liverpool
Post Code
L1 2SU
E-mail
c.duffy1@lancaster.ac.uk
Telephone
07857118103
Fax

Give details of the educational course or degree for which this research is being undertaken:

Name and level of course/degree:
Doctorate in Clinical Psychology

Name of educational establishment:
University of Lancaster

Name and contact details of academic supervisor(s):

Academic supervisor 1

Title Forename/Initials Surname
Dr Pete Greasley
Please state which academic supervisor(s) has responsibility for which student(s):
Please click “Save now” before completing this table. This will ensure that all of the student and academic supervisor details are shown correctly.

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<th>Academic supervisor(s)</th>
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<td>Mr Cormac Duffy</td>
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<td>Dr Pete Greasley</td>
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A copy of a current CV for the student and the academic supervisor (maximum 2 pages of A4) must be submitted with the application.

A2. Who will act as Chief Investigator for this study?

- [ ] Student
- [x] Academic supervisor
- [ ] Other

A3. Chief Investigator:

F. Forename Initials Surname
   Mr Cormac Duffy
Post
   Trainee Clinical Psychologist
Qualifications
   Honours Degree in Psychology (BA)
   Masters in Investigative & Forensic Psychology (MSc)
ORCID ID
Employer
   Lancashire Care NHS Foundation Trust
Work Address
   Clinical Psychology Department
   Division of Health Research
   Lancaster University
Post Code
   LA1 4YG
Work E-mail
   duffy1@lancaster.ac.uk
* Personal E-mail
   duffy Cormac@gmail.com
Work Telephone
   07587 113193
Fax

* This information is optional. It will not be placed in the public domain or disclosed to any other third party without prior consent.
A copy of a current CV (maximum 2 pages of A4) for the Chief Investigator must be submitted with the application.

A4. Who is the contact on behalf of the sponsor for all correspondence relating to applications for this project?
   This contact will receive copies of all correspondence from REC and HRA/R&D reviewers that is sent to the CI.
A5.1. Research reference numbers. Please give any relevant references for your study:

Applicant's/organisation's own reference number, e.g. R & D (if available): R&D
Sponsor's/protocol number: N/A
Protocol Version: V3
Protocol Date: 01/08/2017
Funder's reference number: N/A
Project website: NA

Additional reference number(s):

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Registration of research studies is encouraged wherever possible. You may be able to register your study through your NHS organisation or a register run by a medical research charity, or publish your protocol through an open access publisher. If you have registered your study please give details in the "Additional reference number(s)" section.

A5.2. Is this application linked to a previous study or another current application?

☐ Yes  ☐ No

Please give brief details and reference numbers.

2. OVERVIEW OF THE RESEARCH

To provide all the information required by review bodies and research information systems, we ask a number of specific questions. This section invites you to give an overview using language comprehensible to lay reviewers and members of the public. Please read the guidance notes for advice on this section.

A6.1. Summary of the study. Please provide a brief summary of the research (maximum 300 words) using language easily understood by lay reviewers and members of the public. Where the research is reviewed by a REC within the UK Health Departments’ Research Ethics Service, this summary will be published on the Health Research Authority (HRA) website following the ethical review. Please refer to the question specific guidance for this question.

The number of people sleeping rough has doubled since 2010 (Government, 2015). Research indicates a higher rate of cognitive impairment in those experiencing homelessness compared to the general population (Burra, Stergiopoulos, & Rourke, 2009) with some estimates as high as 80% (Spence, Stevens, & Parks, 2004). A multitude of issues affect those experiencing homelessness that contribute to cognitive deficits including enduring mental health difficulties, substance misuse, and brain injury (BI) (Backer & Howard, 2007; Seidman, Caplan, Tomiczenko et al., 1997). Studies indicate that BI in those experiencing homelessness is common (Topolovec-Vranic et al., 2012). A lack of research in this area makes it difficult to ascertain an exact figure but two UK studies estimate the prevalence of
traumatic BI is 46-48% (Bremner et al., 1990; Oddy et al., 2012). When alcohol or substance-related BI and dementias are considered, the figure increases. The culmination of this body of research is the likelihood that a substantial proportion of people experiencing homelessness also experience difficulty with their cognitive functioning. The cognitive impairment associated with these issues affects functioning in a wide range of areas including attention and memory (Burra, Stergopolous, & Rouke, 2009). This can make it difficult to engage in activities required for daily living and maintaining a household. Accessing and engaging with support from services is made increasingly difficult as it usually requires significant planning and organising skills.

This study will gather detailed information to develop a clear understanding of the neuropsychological needs of those experiencing homelessness. Participants will be recruited from homelessness support services. Once recruited they will complete a validated BI screening tool, neurocognitive assessment, and questionnaire exploring health behaviours and interaction with different services. This self-report data will be supported by information from participants’ health records, which can provide confirmation of a BI (McMillan et al. 2014).

A6.2. Summary of main issues. Please summarise the main ethical, legal, or management issues arising from your study and say how you have addressed them.

Not all studies raise significant issues. Some studies may have straightforward ethical or other issues that can be identified and managed routinely. Others may present significant issues requiring further consideration by a REC, R&D office or other review body (as appropriate to the issue). Studies that present a minimal risk to participants may raise complex organisational or legal issues. You should try to consider all the types of issues that the different reviewers may need to consider.

Careful consideration to risk management is required. All participants will be known to staff at each of the recruitment centres. They will advise the chief investigator (CI) of any relevant risk issues prior to data collection. If there are concerns regarding risk the CI will consult with the field supervisor and onsite clinical staff as appropriate. All data will be collected onsite at the recruitment centres and staff will be aware of the time-slots for each participant. Risk management will be regularly reviewed throughout the project and adapted as required.

There will be no significant time to build rapport with participants prior to data collection so they may not feel comfortable talking to a researcher they have not previously met. Service-users may also feel their care may be affected if they do not participate. To reduce this risk, the information sheet emphasizes that there is no obligation to take part and that the choice is entirely the service-user’s. Prior to commencing each interview the researcher will assess whether the service-user is providing voluntary informed consent to participate. This will involve again emphasizing that participation is voluntary and outlining what is involved in participation. Individuals must demonstrate capacity to consent to participate as assessed by the CI at the start of each data collection session. Capacity will be assessed using the consent form and the CI’s clinical judgement.

The participants of the study will all be experiencing homelessness and are a vulnerable population. As the study will be requesting their time and data, the research team seek to provide participants with something in return. For individuals who are identified as likely to have had a brain injury (BI) they will be supported to acquire a BI identification card from the BI charity Headway. This will facilitate understanding of their needs when they come into contact with different services. For all participants the results from their cognitive assessment can be shared (with consent) with their GP which will also support their care. The aim is for data collection to be a helpful use of their time.

Recruiting individuals experiencing homelessness will be challenging. As such it is essential to convey the ethos and aims of the research to demonstrate that it is seeking to be of benefit to participants in addition to requesting their time and data. The CI will host information evenings at both recruitment sites inviting staff and service-users to attend. The project will be explained and time will be taken to answer all questions and concerns individuals may have. The CI will also meet with service-user groups from different homeless charities and services in the city to seek advice regarding recruitment as well as the design, and dissemination of the project’s results.

If unmet support needs are identified during data collection, the participant will be referred (with consent) to an appropriate service. If it is unclear which service is appropriate we will liaise with the participant’s GP as appropriate.

3. PURPOSE AND DESIGN OF THE RESEARCH

A7. Select the appropriate methodology description for this research. Please tick all that apply.

- Case series/ case note review

7
A10. What is the principal research question/objective? Please put this in language comprehensible to a lay person.

The aim of the project is to identify the neuro-psychological needs of individuals experiencing homelessness primarily by exploring their cognitive functioning.

A11. What are the secondary research questions/objectives if applicable? Please put this in language comprehensible to a lay person.

To collect a variety of different types of data to investigate whether cognitive functioning is affected by these other variables including presence/absence of a brain injury, alcohol/substance misuse, health status, and duration of homelessness.

A12. What is the scientific justification for the research? Please put this in language comprehensible to a lay person.

A growing body of research indicates a higher rate of cognitive impairment in those experiencing homelessness compared to the general population (Burra, Stergiopoulos, & Rourke, 2000) with some estimates being as high as 80% (Spence, Stevens, & Parks, 2004). In spite of this, relatively little is known about the cognitive functioning of those experiencing homelessness compared to the associated socioeconomic, psychiatric, and medical factors (Solliday-McRey, Campbell, Malhornet, et al., 2004). There are a variety of issues connected with experiencing homelessness which can contribute to cognitive deficits such as enduring mental health difficulties, substance misuse, and brain injury (BI) (Backer & Howard, 2007; Seidman, Caplan, Tomiczenko et al., 1997). Studies indicate that BI in those experiencing homelessness is particularly common (Topoloveo-Vranic et al., 2012). However, as with the level of cognitive impairment, a paucity of research coupled with methodological challenges in this area mean it is difficult to determine a precise figure for BI in this population. Two UK studies estimate that the prevalence of traumatic BI in those experiencing homelessness is 46% and 48% respectively (Bremner et al., 1996; Oddy et al., 2012), when alcohol or substance related BI and dementias are considered, this figure increases further. A recent study in America screened 179 people experiencing homelessness for head and neck injuries and identified 87% in the sample as having one, 52% of which involved a loss of consciousness (Brain Fox Valley, 2017).

Together this body of literature indicates that a substantial proportion of individuals experiencing homelessness also experience cognitive impairment (Burra, Stergiopoulos, & Rourke, 2006; Spence, Stevens, & Parks, 2004). Further investigation is now required to advise service providers how to meet the needs of this group. Any such exploration needs to address the methodological challenges that affecting research in this area.

A reliable tool for assessing cognitive functioning is key. Currently, the most common measure of functioning used in research has been the Mini Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975). The MMSE is a brief tool commonly used to screen for dementia. It was not developed to provide a detailed account of a person’s cognitive abilities and has limited faculty in identifying focal cognitive difficulties (Fichter, Koniarzcyk, & Greifenhagen, 1986). Also in one study the MMSE failed to detect over a half of individuals considered to have a cognitive impairment by a battery of neuropsychological assessments (Bremner, Duke, & Nelson, et al., 1996). When a more thorough cognitive assessment such as the Repeatable Battery for the Assessment of Neurological Status (RBANS) (Randolph, Tierney, Mohr, & Chase, 1998) is employed, it is possible to highlight the areas of functioning in which a
of a BI can be supported by information from an individual’s health records which is not subject to recall biases. Another methodological weakness present in research is limited samples, with participants often recruited from single sites that are not representative of those experiencing homelessness.

This study seeks to build and improve upon existing research by gathering detailed data from people experiencing homelessness. Data will be collected via a validated brain injury screening tool (BISI), a neurocognitive assessment (RBANS), a questionnaire exploring health behaviours and interaction with different services, and participant health records. The aim is to provide a detailed account of the neuropsychological needs of a sample of individuals experiencing homelessness. The findings of this research can help inform services working with those affected by homelessness to better understand and support their needs. To date no research has incorporated each of these elements in one study.

113. Please summarise your design and methodology. It should be clear exactly what will happen to the research participant, how many times and in what order. Please complete this section in language comprehensible to the lay person. Do not simply reproduce or refer to the protocol. Further guidance is available in the guidance notes.

This study is aiming to recruit a cross-section of individuals experiencing homelessness to examine the prevalence of neuropsychological issues (cognitive functioning and brain injury history) in this population. Data will be collected in a single session (80-70 minutes) with participants completing the following measures with support from the Chief Investigator:

• An adapted version of the Brain Injury Screening Index (BISI)
• The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS)
• A questionnaire exploring participants’ duration of homelessness, interaction with different services such as the police and A&E, alcohol/substance use, and housing status. This includes also the EuroQol five dimensions questionnaire (EQ5D) which measures quality of life.

The study will also be requesting consent to view health records to determine whether participants had interaction with services for a BI. It will also support participants who want to participate but are unable to complete the full assessment session. This approach reflects the findings of a recent systematic review exploring brain injury and homelessness which recommended that future research in this area should incorporate the following elements: a representative sample, neurocognitive assessment, a validated screening tool, and the use of health records (Topolovec-vranic et al., 2012).

Each of these elements are included in the proposed study.

As the study is exploratory in design and collecting detailed data from each participant a sample size of approximately 30-40 participants is appropriate and in line with previous research (Andersen et al., 2014). Due to the lack of research in this field and cross-sectional design there is no minimum sample size requirement however for the purpose of analysis the study will aim for at least 20 participants. Participants will be recruited from services supporting individuals experiencing homelessness in a large UK city. These include the Liverpool XXXXXXX which has accommodation for 100 individuals and XXXXXXXX Practice which has a dedicated weekly homeless surgery.

The CI will host information events with staff and services at recruitment sites to explain the project and answer questions. Staff will be provided with information sheets to allow them to publicise the project to their respective service-users. A number of time-slots will be arranged for each venue which participants can select to participate in the study.

The recruitment procedure for two of the sites are as follows:

XXXXXXXX:
Staff will publicise the project to their service-users. If an individual expresses an interest in participating they can then choose one of the slots to participate.

XXXXXXXXX Practice:
Staff will publicise the project to patients attending the weekly surgery for individuals experiencing homelessness. If an individual expresses interest in participating staff will direct them to the chief investigator (who will be attending the weekly surgeries during the recruitment period) to schedule a session for data collection.

The study will also be recruiting at other similar day services in XXXX city. They will follow the same approach as the above services. The project will also be advertised across the services via posters in communal areas.

Participants will need to be registered with the practice in order to provide consent to access their health records. The
researchers will support participants to register at the GP practice to facilitate collection of this data.

In line with previous research it will be expected that participants’ cognitive functioning will be lower than the population norms. It is also expected that there will be a higher rate of BI than in the general population.

The timetable for the study is as follows:

June 2017 - August 2017: Preparation including consulting local services for those experiencing homelessness including the Homeless Forum which is service-user led.
September 2017 - December 2017: Data collection & Analysis
January 2018 - April 2018 - Continue analysis and prepare report.
May 2018 - Submit final report

A14-1. In which aspects of the research process have you actively involved, or will you involve, patients, service users, and/or their carers, or members of the public?

- Design of the research
- Management of the research
- Undertaking the research
- Analysis of results
- Dissemination of findings
- None of the above

Give details of involvement, or if none please justify the absence of involvement.

The researcher team has relationships with a number of homelessness charities in the local area. The Chief Investigator (CI) has consulted with a local service-user group consisting of individuals with lived experience of homelessness and related issues (based at the The Basement a Liverpool homeless charity). They have advised on the design and materials of the project.

They advised that the materials were suitable for working with this population. They advised that participants be recruited from several services related to homelessness. This would reduce the barriers in place that may hinder participation.

As this group have direct experience of homelessness their advice regarding the design and undertaking of the research was invaluable. Following completion of the project they will be invited to support the dissemination of the project’s findings with the CI. This may take a number of formats such as contribution to academic/non-academic papers and presentations.

4. RISKS AND ETHICAL ISSUES

RESEARCH PARTICIPANTS

A15. What is the sample group or cohort to be studied in this research?

Select all that apply:

- Blood
- Cancer
- Cardiovascular
- Congenital Disorders
- Dementias and Neurodegenerative Diseases
A17-1. Please list the principal inclusion criteria (list the most important, max 5000 characters).

Participants will be recruited from services for individuals experiencing homelessness in XXX city centre. These include the XXX, which is a XXX bed accommodation and support service, and XXX Practice which is a health service in central Liverpool. XXXXXX Health Practice which has a dedicated weekly surgery for individuals experiencing homelessness. Approximately 750 individuals are registered as homeless at the practice (this will likely include those being accommodated by the XXX) however individuals will only be recruited from the practice if they attend the weekly homeless surgery.

The primary inclusion criteria are participation are as follows:
- Aged 18 years or older.
- Currently experiencing homelessness. In line with the literature, participants will be considered homeless if they have been living at a hostel within the last seven days and do not have a home of their own (Hwang et al., 2008). Individuals who are sleeping rough will also be considered homeless.
- An individual must have the capacity to provide voluntary informed consent to engage in data collection. Capacity will be assessed by the chief investigator at the time of data collection.
- As data collection includes gathering relevant information from participant health records individuals will need to be registered with the XXX Health practice in order to participate. If individuals want to participate who are not registered with the practice the CI will support them to register (if that is their preference). Participants will need to attend the dedicated homelessness surgery during the recruitment period to participate.

A17-2. Please list the principal exclusion criteria (list the most important, max 5000 characters).

The primary exclusion criteria will be if the individual does not demonstrate capacity to consent to participate in the study.
A24. What is the potential for benefit to research participants?

Participation in the study provides participants with access to cognitive assessment from a trainee clinical psychologist (under the supervision of a qualified clinical neuropsychologist) which is not widely available. The results of this assessment can then be shared with the participant’s GP to inform their care and support needs.

No study to date has collected this range of data hence findings may be used to inform local and national services for individuals experiencing homelessness.

A26. What are the potential risks for the researchers themselves? (If any)

The participants will not be known to the CI who will be conducting all data collection. As such to ensure the safety during data collection a number of procedures will be adhered to:

- The CI will follow the local lone working policy at each recruitment site for keeping staff safe. This will also be informed by the CI’s employer’s (Lancashire Care Foundation Trust) lone worker policy. These measures include making on-site staff aware of the start and proposed end time of data collection sessions so they can check on the CI and participant if they over run.
- All participants will be known to the staff at the recruitment sites and they will be consulted regarding any potential risk issues prior to data collection. All data collection will be conducted on-site at the recruitment sites.
- Staff at the recruitment sites will be provided with the time slots for each data collection session.

RECRUITMENT AND INFORMED CONSENT

In this section we ask you to describe the recruitment procedures for the study. Please give separate details for different study groups where appropriate.

A27-1. How will potential participants, records or samples be identified? Who will carry this out and what resources will be used? For example, identification may involve a disease register, computerised search of social care or GP records, or review of medical records. Indicate whether this will be done by the direct care team or by researchers acting under arrangements with the responsible care organisation(s).

Participants will be recruited from services for individuals experiencing homelessness in Liverpool. These include the XXXXXXX, which is an accommodation and support service and XXXXXXX Practice which is a health service in central Liverpool. The CI will meet with staff at venues to explain the project, answer questions, and provide them with participant information sheets to allow them to publicise the project to their respective service-users. We will arrange a number of time-slots at each venue which participants can select to participate in the study.

XXXXXXX:
Staff will publicise the project to their service-users as they come into contact with them. If an individual expresses an interest in participating they can then choose one of the agreed time-slots to participate.

XXXXXXX Practice:
Staff will publicise the project to patients attending the weekly surgery for individuals experiencing homelessness. If an individual expresses interest in participating staff will direct them to the chief investigator (who will be attending the weekly surgeries during the recruitment period) to schedule a session for data collection.

The CI is in discussion with other services to support participation in line with the approach used at the XXXXXXX above.
A27-2. Will the identification of potential participants involve reviewing or screening the identifiable personal information of patients, service users or any other person?

☐ Yes  ☐ No

Please give details below:

A28. Will any participants be recruited by publicity through posters, leaflets, adverts or websites?

☐ Yes  ☐ No

If Yes, please give details of how and where publicity will be conducted, and enclose copy of all advertising material (with version numbers and dates).

Posters will be placed throughout the recruitment centres and in other services supporting individuals experiencing homelessness. This will advise individuals that they can attend the weekly homelessness surgery in the city centre if they would like to participate. It will also include the email address of the CI, a trained clinical psychologist. A copy of the poster is attached with the research protocol.

A29. How and by whom will potential participants first be approached?

Potential participants will be approached directly by a member of staff at the recruitment centres as outlined in the recruitment strategy above. This contact will consist solely of information provision. If an individual expresses interest in participating they can either choose a time slot for data collection or approach the CI to discuss the project in more detail. The CI will make themselves available during the weekly homelessness surgery at Brownlow Health and for drop-in times at other related services.

A30-1. Will you obtain informed consent from or on behalf of research participants?

☐ Yes  ☐ No

If you will be obtaining consent from adult participants, please give details of who will take consent and how it will be done, with details of any steps to provide information (a written information sheet, videos, or interactive material).

Arrangements for adults unable to consent for themselves should be described separately in Part B Section 6, and for children in Part B Section 7.

If you plan to seek informed consent from vulnerable groups, say how you will ensure that consent is voluntary and fully informed.

Voluntary informed consent will be need to be provided by each participant before any data is collected. This will be completed by the CI at the start of each data collection session using the information sheet and consent form.

If you are not obtaining consent, please explain why not.

Please enclose a copy of the information sheet(s) and consent form(s).

A30-2. Will you record informed consent (or advice from consultees) in writing?

☐ Yes  ☐ No

A31. How long will you allow potential participants to decide whether or not to take part?

The posters will be up throughout the recruitment centres and other relevant services for the proposed duration of data collection (approximately three months). During this time information regarding the study will be provided to service-users who attend the homelessness surgery.
A33. What arrangements have been made for persons who might not adequately understand verbal explanations or written information given in English, or who have special communication needs? (e.g. translation, use of interpreter)

All research materials and interviews will be in English (the language of the CI). Should a non-English speaking individual wish to participate funding will be sought to translate the research material and employ a translator for the interview.

A35. What steps would you take if a participant, who has given informed consent, loses capacity to consent during the study? Tick one option only:

- The participant and all identifiable data or tissue collected would be withdrawn from the study. Data or tissue which is not identifiable to the research team may be retained.
- The participant would be withdrawn from the study. Identifiable data or tissue already collected with consent would be retained and used in the study. No further data or tissue would be collected or any other research procedures carried out on or in relation to the participant.
- The participant would continue to be included in the study.
- Not applicable – informed consent will not be sought from any participants in this research.
- Not applicable – it is not practicable for the research team to monitor capacity and continued capacity will be assumed.

Further details:
Capacity will be sought at the start of the interview which will be approximately one hour. Capacity will continue to be monitored throughout the interview. Should the researcher suspect that the participant loses capacity to consent during the interview, it will be discussed and sought again from the participant. If they have lost capacity to consent the interview would not continue and the researcher would seek guidance from their academic or field supervisor. Any such incidents would be considered on a case by case basis. The possibility of the data already collected being used in the study will be detailed on the information sheet and consent form.

If you plan to retain and make further use of identifiable data/tissue following loss of capacity, you should inform participants about this when seeking their consent initially.

CONFIDENTIALITY

In this section, personal data means any data relating to a participant who could potentially be identified. It includes pseudonymised data capable of being linked to a participant through a unique code number.

Storage and use of personal data during the study

A36. Will you be undertaking any of the following activities at any stage (including in the identification of potential participants)? (Tick as appropriate)

- Access to medical records by those outside the direct healthcare team
- Access to social care records by those outside the direct social care team
- Electronic transfer by magnetic or optical media, email or computer networks
- Sharing of personal data with other organisations
- Export of personal data outside the EEA
- Use of personal addresses, postcodes, faxes, emails or telephone numbers
- Publication of direct quotations from respondents
- Publication of data that might allow identification of individuals
- Use of audio/visual recording devices
- Storage of personal data on any of the following:
  - Manual files (includes paper or film)
Further details:
The assessment will be conducted on paper documents which will then be input remotely to a spreadsheet document stored on the CI's protected university account using Lancaster University's secure Virtual Private Network. The hard copies will be stored in a secure location (a locked cabinet) onsite at the recruitment centre. Data input may also take place at the CI's home. Here they will be kept in a locked cabinet to which only the CI has access. Each participant will be assigned a participant number so that there will be no personal identifiable details taken offsite from recruitment centres. Only this will appear on all hard copies.

Hard copies of the assessment details will be destroyed following completion of the project unless the participant wants a record of their cognitive assessment kept in their health records.

The participants' direct clinical team will facilitate the CI's access to health records onsite at Brownlow Health. Information regarding participants' brain injury history will be recorded on a paper document which will then be input to the above spreadsheet. Again participants will only be referred to by their participant number on this document.

A37. Please describe the physical security arrangements for storage of personal data during the study?
Please see A36 for physical security arrangements.
Any data on portable devices used will be encrypted and will be deleted as quickly as possible.

A38. How will you ensure the confidentiality of personal data? Please provide a general statement of the policy and procedures for ensuring confidentiality, e.g. anonymisation or pseudonymisation of data.
During data collection participant number will be applied to each participant. Only the CI will have access to the identities of the participants which will be stored in the form of a password protected word document on the researcher's secure university account.

A40. Who will have access to participants' personal data during the study? Where access is by individuals outside the direct care team, please justify and say whether consent will be sought.
Voluntary informed consent will be sought to access participants' personal data in the form of their health records held by their GP surgery. This will be accessed by the CI, a trainee clinical psychologist, with support from the direct care team in order to identify whether the participant has a history of brain injury.

The purpose of accessing health records and who will have access to them will be detailed on the participant information sheet and consent form. At the start of each data collection session, the CI will discuss the accessing of health records with the participant to ensure their consent and understanding.

Storage and use of data after the end of the study

A41. Where will the data generated by the study be analysed and by whom?
All data generated by the study will be stored on the CI's university account which is password protected and in an encrypted environment maintained by Lancaster University.
The data will be analysed by the CI either at the university or using the university's secure Virtual Private Network (VPN) to access the data from home. No data will be stored outside of the computer system secured by Lancaster University.

The field and research supervisors will have limited access to the data for data quality purposes.
A42. Who will have control of and act as the custodian for the data generated by the study?

Title  Forename/Initials  Surname  
Mr  Bill  Selwood  
Post  Programme Director, Doctorate of Clinical Psychology, Lancaster  
Qualifications  PhD  
Work Address  Division of Health Research  
Furness College, Lancaster University, Lancaster  
Post Code  LA1 4YG  
Work Email  b.sellwood@lancaster.ac.uk  
Work Telephone  01524593368  
Fax  01524592401  

A43. How long will personal data be stored or accessed after the study has ended?

☐ Less than 3 months  
☐ 3 – 6 months  
☐ 6 – 12 months  
☐ 12 months – 3 years  
☐ Over 3 years  

A44. For how long will you store research data generated by the study?

Years:  10  
Months:  

A45. Please give details of the long term arrangements for storage of research data after the study has ended. Say where data will be stored, who will have access and the arrangements to ensure security.

Following completion of the study the data will be stored securely by the doctorate in clinical psychology programme at the University of Lancaster.

All data will be saved electronically, including consent forms which will be scanned and saved. The paper copies of all forms will be securely destroyed following scanning.

All data will be saved in password-protected file space on the university server in an encrypted environment.

Following the researcher's completion of the doctorate access to the data will be transferred to a research coordinator who will have access to the information. For this project this will be the academic supervisor.

INCENTIVES AND PAYMENTS

A46. Will research participants receive any payments, reimbursement of expenses or any other benefits or incentives for taking part in this research?

☐ Yes  ☐ No  

A47. Will individual researchers receive any personal payment over and above normal salary, or any other benefits or incentives, for taking part in this research?
A48. Does the Chief Investigator or any other investigator/collaborator have any direct personal involvement (e.g. financial, share holding, personal relationship etc.) in the organisations sponsoring or funding the research that may give rise to a possible conflict of interest?

☐ Yes  ☐ No

NOTIFICATION OF OTHER PROFESSIONALS

A49-1. Will you inform the participants’ General Practitioners (and/or any other health or care professional responsible for their care) that they are taking part in the study?

☐ Yes  ☐ No

If Yes, please enclose a copy of the information sheet/letter for the GP/health professional with a version number and date.

A49-2. Will you seek permission from the research participants to inform their GP or other health/ care professional?

☐ Yes  ☐ No

It should be made clear in the participant’s information sheet if the GP/health professional will be informed.

PUBLICATION AND DISSEMINATION

A50-1. Will the research be registered on a public database?

☐ Yes  ☐ No

Please give details, or justify if not registering the research.
If the report of the study gets published then the research will be accessible from multiple academic databases.

Registration of research studies is encouraged wherever possible. You may be able to register your study through your NHS organisation or a register run by a medical research charity, or publish your protocol through an open access publisher. If you are aware of a suitable register or other method of publication, please give details. If not, you may indicate that no suitable register exists. Please ensure that you have entered registry reference number(s) in question A5-1.

A51. How do you intend to report and disseminate the results of the study? Tick as appropriate:

☐ Peer reviewed scientific journals
☐ Internal report
☐ Conference presentation
☐ Publication on website
☐ Other publication
☐ Submission to regulatory authorities
☐ Access to raw data and right to publish freely by all investigators in study or by Independent Steering Committee on behalf of all investigators
☐ No plans to report or disseminate the results
☐ Other (please specify)
The researcher will seek to present the results at an appropriate conference. This is in addition to presenting the study
to university colleagues at a research presentation event. The findings will also be presented to interested staff and service-users at the Trust in which the study was conducted.

A52. If you will be using identifiable personal data, how will you ensure that anonymity will be maintained when publishing the results?

As outlined in the participant information sheet and consent form each participant will be assigned a participant number. The results will also be reported in aggregated form which will mean it will not be possible to identify individual participants’ responses.

A53. Will you inform participants of the results?

☐ Yes ☐ No

Please give details of how you will inform participants or justify if not doing so.
The findings will be presented to interested staff, participants, and other service-users at the services in which the study was conducted.

5. Scientific and Statistical Review

A54-1. How has the scientific quality of the research been assessed? Tick as appropriate:

☐ Independent external review
☐ Review within a company
☐ Review within a multi-centre research group
☑ Review within the Chief Investigator’s institution or host organisation
☑ Review within the research team
☑ Review by educational supervisor
☐ Other

Justify and describe the review process and outcome. If the review has been undertaken but not seen by the researcher, give details of the body which has undertaken the review:
The scientific quality of the research has been assessed by a number of parties. These include Dr Pete Greasley the project’s academic supervisor. Dr Greasley has extensive experience in the supervision of doctoral research and teaches research methods on the doctorate in clinical psychology at the University of Lancaster. The proposal for the research has also been reviewed by the university’s research team. The project is also assessed by the University’s Research Support Office.

For all studies except non-doctoral student research, please enclose a copy of any available scientific critique reports, together with any related correspondence.

For non-doctoral student research, please enclose a copy of the assessment from your educational supervisor/ institution.

A56. How have the statistical aspects of the research been reviewed? Tick as appropriate:

☐ Review by independent statistician commissioned by funder or sponsor
☐ Other review by independent statistician
☐ Review by company statistician
☑ Review by a statistician within the Chief Investigator’s institution
☐ Review by a statistician within the research team or multi-centre group
☑ Review by educational supervisor
☑ Other review by individual with relevant statistical expertise
In all cases please give details below of the individual responsible for reviewing the statistical aspects. If advice has been provided in confidence, give details of the department and institution concerned.

Title: Forename/Initials: Surname: Dr. Pete Greasley
Department: Division of Health Research
Institution: Lancaster University
Work Address:

Post Code: LA1 4YG
Telephone: +44 (0)1524 593535
Fax:
Mobile:
E-mail: p.greasley@lancaster.ac.uk

Please enclose a copy of any available comments or reports from a statistician.

A57. What is the primary outcome measure for the study?

The primary outcome measure for the study is the participant's cognitive functioning as measured by their scores on the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS).

A58. What are the secondary outcome measures? (if any)

Secondary outcome measures include the participants' brain injury status based on their responses to the brain injury screening index (this will give a positive or negative screening) and information from their health records regarding admissions for a head injury. The other secondary measures will be the participants' service use, health behaviours, duration of homelessness, and health-related quality of life.

A59. What is the sample size for the research? How many participants/samples/data records do you plan to study in total? If there is more than one group, please give further details below.

Total UK sample size: 30
Total international sample size (including UK): 30
Total in European Economic Area: 30

Further details:
It is proposed that a sample size of approximately 30-40 participants will be sufficient to make a significant contribution to the field.

A60. How was the sample size decided upon? If a formal sample size calculation was used, indicate how this was done, giving sufficient information to justify and reproduce the calculation.

Based on previous research, the lack of research in this area, and the multiple sources from which data are collected the above sample size is considered appropriate. The researcher supervision team is made up of practitioners with both clinical and research experience in this field have agreed that this sample size is appropriate. A statistician from the university of Lancaster has also informed the sample size.

A61. Will participants be allocated to groups at random?

☐ Yes  ☐ No
A62. Please describe the methods of analysis (statistical or other appropriate methods, e.g. for qualitative research) by which the data will be evaluated to meet the study objectives.

All analysis will be conducted using the Statistical Package for Social Sciences (SPSS).

The primary aim of the analysis will be to provide a profile of a cross-section of people experiencing homelessness and their interaction with services. This profile will be made up of the following elements. Cognitive functioning will be described in terms of percentile scores across the five domains of the RBANS as well as an overall score. The questionnaire will provide ratio data regarding the previous year of the participants’ life. This includes their use of physical and mental health services in addition to interaction with the police, alcohol/substance use, and health-related quality of life. BI status will be described via nominal data: a positive or negative indication of a BI (derived from the BISI and health records) as well as a categorical classification of likely type of BI (traumatic brain injury, dementia, or alcohol/substance related). The profile will also include demographic information such as age, gender, sexual orientation, and ethnicity.

The study will seek to explore if relationships exist between the different elements making up the profile. It will be explored whether cognitive scores are correlated with level of interaction with different services, alcohol/substance use, nights spent in different sleeping situations (for example rough-sleeping/hostels), duration of homelessness, and health-related quality of life. Depending on whether the criteria are met for parametric tests correlations will be conducted using Pearson’s correlation coefficient or Spearman’s rho. Bivariate tests will be applied to identify whether differences exist between individuals with or without a brain injury in terms of their cognitive scores. Again this may be conducted using independent t-tests (parametric) or the Mann-Whitney U test (non-parametric) depending on whether parametric criteria have been met. Chi square analysis may be used to explore relationships involving nominal data such as ethnicity and brain injury status.

A sample of the RBANS and BISI data will be scored by one or more of the study’s supervisors for quality assurance purposes.

6. MANAGEMENT OF THE RESEARCH

A63. Other key investigators/collaborators. Please include all grant co-applicants, protocol co-authors and other key members of the Chief Investigator’s team, including non-doctoral student researchers.

<table>
<thead>
<tr>
<th>Title Forename/Initials Surname</th>
<th>Dr Pete Greasley</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post</td>
<td>Lecturer &amp; Researcher</td>
</tr>
<tr>
<td>Qualifications</td>
<td>PhD</td>
</tr>
<tr>
<td>Employer</td>
<td>Lancaster University</td>
</tr>
<tr>
<td>Work Address</td>
<td>Division of Health Research</td>
</tr>
<tr>
<td></td>
<td>Furness College</td>
</tr>
<tr>
<td>Post Code</td>
<td>LA1 4YG</td>
</tr>
<tr>
<td>Telephone</td>
<td>+44 (0)1524 593535</td>
</tr>
<tr>
<td>Fax</td>
<td></td>
</tr>
<tr>
<td>Mobile</td>
<td></td>
</tr>
<tr>
<td>Work Email</td>
<td><a href="mailto:p.greasley@lancaster.ac.uk">p.greasley@lancaster.ac.uk</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title Forename/Initials Surname</th>
<th>Dr Stephen Weatherhead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post</td>
<td>Senior Clinical Tutor</td>
</tr>
<tr>
<td>Qualifications</td>
<td>BA, DClinPsy</td>
</tr>
<tr>
<td>Employer</td>
<td>Liverpool University</td>
</tr>
<tr>
<td><strong>Title</strong></td>
<td>Forename/Initials</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------</td>
</tr>
<tr>
<td>Dr</td>
<td>Martin</td>
</tr>
</tbody>
</table>

**Post**

Researcher

**Qualifications**

PhD, MA, MSc, BSc

**Employer**

Liverpool University

**Work Address**

Block B, 2nd Floor
Liverpool

**Post Code**

L69 3BX

**Telephone**

+44 (0)151 705 5312

**Fax**

**Mobile**

ste@liverpool.ac.uk

**Work Email**

Martin.Whiteford@liverpool.ac.uk

---

**A64. Details of research sponsor(s)**

**A64-1. Sponsor**

**Lead Sponsor**

- [ ] NHS or HSC care organisation
- [x] Academic
- [ ] Pharmaceutical industry
- [ ] Medical device industry
- [ ] Local Authority
- [ ] Other social care provider (including voluntary sector or private organisation)
- [ ] Other

*If Other, please specify:*

**Contact person**

Name of organisation: University of Lancaster

Given name: Diane

Family name: Hopkins

Address: Research Integrity and Governance Officer

Town/city: Research Services, Lancaster University
A65. Has external funding for the research been secured?

- [ ] Funding secured from one or more funders
- [ ] External funding application to one or more funders in progress
- [x] No application for external funding will be made

What type of research project is this?

- [ ] Standalone project
- [ ] Project that is part of a programme grant
- [ ] Project that is part of a Centre grant
- [ ] Project that is part of a fellowship/ personal award/ research training award
- [ ] Other

Other – please state:

A66. Has responsibility for any specific research activities or processes been delegated to a subcontractor (other than a co-sponsor listed in A64-1)? Please give details of subcontractors if applicable.

- [ ] Yes
- [x] No

A67. Has this or a similar application been assessed by a Research Ethics Committee in the UK or another country?

- [ ] Yes
- [x] No

Please provide a copy of the unfavourable opinion letter(s). You should explain in your answer to question A6-2 how the reasons for the unfavourable opinion have been addressed in this application.

A68-1. Give details of the lead NHS R&D contact for this research:

Title
Forename/Initials
Surname
Mr

Organisation
Address
Liverpool

Post Code
Work Email
Telephone
Fax
Mobile

Details can be obtained from the NHS R&D Forum website: http://www.cfiforum.nhs.uk

A69.1. How long do you expect the study to last in the UK?

Planned start date: 22/09/2017
Planned end date: 07/05/2018
Total curation:
Years: 0 Months: 7 Days: 16

A71.1. Is this study?

☐ Single centre
☐ Multicentre

A71.2. Where will the research take place? (Tick as appropriate)

☐ England
☐ Scotland
☐ Wales
☐ Northern Ireland
☐ Other countries in European Economic Area

Total UK sites in study 2

Does this trial involve countries outside the UK?
☐ Yes ☐ No

A72. Which organisations in the UK will host the research? Please indicate the type of organisation by ticking the box and give approximate numbers if known.

☐ NHS organisations in England
☐ NHS organisations in Wales
☐ NHS organisations in Scotland
☐ HSC organisations in Northern Ireland
☐ GP practices in England 1
☐ GP practices in Wales
☐ GP practices in Scotland
☐ GP practices in Northern Ireland
☐ Joint health and social care agencies (e.g. community mental health teams)
☐ Local authorities
☐ Phase 1 trial units
☐ Prison establishments
☐ Probation areas
☐ Independent (private or voluntary sector) organisations 1
<table>
<thead>
<tr>
<th>Educational establishments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent research units</td>
</tr>
<tr>
<td>Other (give details)</td>
</tr>
</tbody>
</table>

Total UK sites in study: 2

**A73-1. Will potential participants be identified through any organisations other than the research sites listed above?**

- [ ] Yes
- [ ] No

If yes, details should be given in Part C.

**A74. What arrangements are in place for monitoring and auditing the conduct of the research?**

The CI is supervised by an academic supervisor and two field supervisors, this will involve regular supervisory contact in the form of email, phone calls, and meetings to discuss and monitor the project.

The CI will keep supervisors updated on the project at each stage of the research.

**A76. Insurance/ indemnity to meet potential legal liabilities**

*Note: In this question to NHS indemnity schemes include equipment schemes provided by Health and Social Care (HSC) in Northern Ireland.*

**A76-1. What arrangements will be made for insurance and/or indemnity to meet the potential legal liability of the sponsor(s) for harm to participants arising from the conduct of the research?** Please tick box(es) as applicable.

- [ ] NHS indemnity scheme will apply (NHS sponsors only)
- [x] Other insurance or indemnity arrangements will apply (give details below)

Lancaster University legal liability will apply.

Please enclose a copy of relevant documents.

**A76-2. What arrangements will be made for insurance and/or indemnity to meet the potential legal liability of the sponsor(s) or employer(s) for harm to participants arising from the design of the research?** Please tick box(es) as applicable.

*Note: Where researchers with substantive NHS employment contracts have designed the research, indemnity is provided through NHS schemes. Indicate if this applies (there is no need to provide documentary evidence). For other protocol authors (e.g. company employees, university members), please describe the arrangements and provide evidence.*

- [ ] NHS indemnity scheme will apply (protocol authors with NHS contracts only)
- [x] Other insurance or indemnity arrangements will apply (give details below)
Lancaster University legal liability will apply.

Please enclose a copy of relevant documents.

A76.3. What arrangements will be made for insurance and/or indemnity to meet the potential legal liability of investigators/collaborators arising from harm to participants in the conduct of the research?

Note: Where the participants are NHS patients, indemnity is provided through the NHS schemes or through professional indemnity. Indicate if this applies to the whole study (there is no need to provide documentary evidence). Where non-NHS sites are to be included in the research, including private practices, please describe the arrangements which will be made at these sites and provide evidence.

- [ ] NHS indemnity scheme or professional indemnity will apply (participants recruited at NHS sites only)
- [x] Research includes non-NHS sites (give details of insurance/indemnity arrangements for these sites below)

Lancaster University legal liability cover will apply.

Please enclose a copy of relevant documents.

A78. Could the research lead to the development of a new product/process or the generation of intellectual property?

- [x] Yes
- [ ] No
- [ ] Not sure

PART C: Overview of research sites

Please enter details of the host organisations (Local Authority, NHS or other) in the UK that will be responsible for the research sites. For further information please refer to guidance.

<table>
<thead>
<tr>
<th>Investigator identifier</th>
<th>Research site</th>
<th>Investigator Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN1</td>
<td></td>
<td>Cormac</td>
</tr>
<tr>
<td></td>
<td>NHS/HSC Site</td>
<td>Forename</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Middle name</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Family name</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Email</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Qualification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Country</td>
</tr>
<tr>
<td></td>
<td>Non-NHS/HSC Site</td>
<td>BA MSc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UNITED KINGDOM</td>
</tr>
<tr>
<td></td>
<td>Organisation name</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Address</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post Code</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Country</td>
<td>ENGLAND</td>
</tr>
</tbody>
</table>

| IN2                     |               | Cormac            |
|                         | NHS/HSC Site  | Forename          |
|                         |               | Middle name       |
|                         | Non-NHS/HSC Site | Family name      |
|                         |               | Email             |
|                         |               | c.duff1@lancaster.ac.uk |
|                         |               |                   |
Mr Cormac Duffy  
Trainee Clinical Psychologist  
Lancashire Care NHS Foundation Trust  
Clinical Psychology Department  
Division of Health Research  
Lancaster University  
LA1 4YG  

04 October 2017  

Dear Mr Duffy  

Letter of HRA Approval  

**Study title:** An exploration of the neuropsychological needs of individuals experiencing homelessness  
**IRAS project ID:** 230238  
**Protocol number:** N/A  
**REC reference:** 17/NW/0509  
**Sponsor** University of Lancaster  

I am pleased to confirm that **HRA Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.  

Participation of NHS Organisations in England  
The sponsor should now provide a copy of this letter to all participating NHS organisations in England.  

*Appendix B* provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. **Please read Appendix B carefully**, in particular the following sections:  
- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities.
• **Confirmation of capacity and capability** - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.

• **Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)** - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Further information on funding, HR processes, and compliance with HRA criteria and standards is also provided.

It is critical that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details and further information about working with the research management function for each organisation can be accessed from www.hra.nhs.uk/hra-approval.

Appendices

The HRA Approval letter contains the following appendices:

- A – List of documents reviewed during HRA assessment
- B – Summary of HRA assessment

**After HRA Approval**

The document “After Ethical Review – guidance for sponsors and investigators”, issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

In addition to the guidance in the above, please note the following:

- HRA Approval applies for the duration of your REC favourable opinion, unless otherwise notified in writing by the HRA.
- Substantial amendments should be submitted directly to the Research Ethics Committee, as detailed in the After Ethical Review document. Non-substantial amendments should be submitted for review by the HRA using the form provided on the HRA website, and emailed to hra.amendments@nhs.net.
- The HRA will categorise amendments (substantial and non-substantial) and issue confirmation of continued HRA Approval. Further details can be found on the HRA website.

Scope
HRA Approval provides an approval for research involving patients or staff in NHS organisations in England.

If your study involves NHS organisations in other countries in the UK, please contact the relevant national coordinating functions for support and advice. Further information can be found at http://www.hra.nhs.uk/resources/applying-for-reviews/nhs-hsc-rd-review/.

If there are participating non-NHS organisations, local agreement should be obtained in accordance with the procedures of the local participating non-NHS organisation.

User Feedback
The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/.

HRA Training
We are pleased to welcome researchers and research management staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

Your IRAS project ID is 230238. Please quote this on all correspondence.

Yours sincerely

Aliki Sifostratoudaki
Assessor

Email: hra.approval@nhs.net

Copy to: Dr Diane Hopkins, Lancaster University, Sponsor Contact
XXXXXXXXXXXXXXXXXXXXXXXXXXX, R&D Contact
Appendix A - List of Documents

The final document set assessed and approved by HRA Approval is listed below.

<table>
<thead>
<tr>
<th>Document</th>
<th>Version</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copies of advertisement materials for research participants [Study Poster]</td>
<td>Version 2</td>
<td>04 August 2017</td>
</tr>
<tr>
<td>Covering letter on headed paper [Amendments Cover Letter]</td>
<td>Version 1</td>
<td>20 September 2017</td>
</tr>
<tr>
<td>Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Insurance Letter 1]</td>
<td>Version 1</td>
<td>07 August 2017</td>
</tr>
<tr>
<td>HRA Schedule of Events [230238_Schedule of Events_Assessed by HRA]</td>
<td>1</td>
<td>05 September 2017</td>
</tr>
<tr>
<td>HRA Statement of Activities [230238_Statement-activities_PIC Activity assessed by HRA]</td>
<td>1</td>
<td>20 September 2017</td>
</tr>
<tr>
<td>HRA Statement of Activities [230238_Statement of Activities_Assessed by HRA]</td>
<td>1</td>
<td>05 September 2017</td>
</tr>
<tr>
<td>Interview schedules or topic guides for participants [Sample Interview Schedule]</td>
<td>Version 1</td>
<td>08 August 2017</td>
</tr>
<tr>
<td>IRAS Application Form [IRAS_Form_07082017]</td>
<td></td>
<td>07 August 2017</td>
</tr>
<tr>
<td>Letter from sponsor [Sponsorship Letter]</td>
<td>Version 1</td>
<td>04 August 2017</td>
</tr>
<tr>
<td>Non-validated questionnaire [Participant Questionnaire]</td>
<td>Version 3</td>
<td>18 September 2017</td>
</tr>
<tr>
<td>Participant consent form [Consent Form]</td>
<td>Version 3</td>
<td>20 September 2017</td>
</tr>
<tr>
<td>Participant information sheet (PIS) [Participant Information Sheet]</td>
<td>Version 3</td>
<td>20 September 2017</td>
</tr>
<tr>
<td>Research protocol or project proposal [Research Protocol]</td>
<td>Version 3</td>
<td>04 August 2017</td>
</tr>
<tr>
<td>Summary CV for Chief Investigator (CI) [CI CV]</td>
<td>Version 2</td>
<td>04 August 2017</td>
</tr>
<tr>
<td>Summary CV for supervisor (student research) [Research Supervisor CV]</td>
<td></td>
<td>04 August 2017</td>
</tr>
</tbody>
</table>

Appendix B - Summary of HRA Assessment

This appendix provides assurance to you, the sponsor and the NHS in England that the study, as reviewed for HRA Approval, is compliant with relevant standards. It also provides information and clarification, where appropriate, to participating NHS organisations in England to assist in assessing and arranging capacity and capability.

For information on how the sponsor should be working with participating NHS organisations in England, please refer to the, participating NHS organisations, capacity and capability and Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria) sections in this appendix.

The following person is the sponsor contact for the purpose of addressing participating organisation questions relating to the study:
HRA assessment criteria

<table>
<thead>
<tr>
<th>Section</th>
<th>HRA Assessment Criteria</th>
<th>Compliant with Standards</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>IRAS application completed correctly</td>
<td>Yes</td>
<td>The applicant has confirmed that there will be two site types recruited for this study. Research sites and Participant Identification Centres (PIC sites). The applicant confirmed that if new site types are added to this study, an amendment will be submitted.</td>
</tr>
<tr>
<td>2.1</td>
<td>Participant information/consent documents and consent process</td>
<td>Yes</td>
<td>For the purpose of HRA assessment revisions were necessary to the participant information sheet and consent form in order to bring them in line with HRA standards.</td>
</tr>
<tr>
<td>3.1</td>
<td>Protocol assessment</td>
<td>Yes</td>
<td>No comments</td>
</tr>
<tr>
<td>4.1</td>
<td>Allocation of responsibilities and rights are agreed and</td>
<td>Yes</td>
<td>There are two site types for this study.</td>
</tr>
<tr>
<td>Documented</td>
<td>Site type 1: PIC sites (display of posters only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A Statement of Activities has been submitted for the PIC sites. The applicant confirmed that this document will form the agreement between the Sponsor and the PIC sites.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>As PIC activity will be minimal (display of study posters), the Schedule of Events was not required.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Site type 2: Research sites</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Sponsor contact has confirmed that the Statement of Activities and the Schedule of Events will form the agreement between the Sponsor and the research sites.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minor changes were made to these documents to bring them in line with HRA Approval standards.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>Insurance/indemnity arrangements assessed</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The applicant has confirmed that the management and design of the study will be covered by Lancaster University legal liability. The conduct of the study will be covered by NHS indemnity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Where applicable, independent contractors (e.g. General Practitioners) should ensure that the professional indemnity provided by their medical defence organisation covers the activities expected of them for this research study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3</td>
<td>Financial arrangements assessed</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This study is not funded.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>HRA Assessment Criteria</td>
<td>Compliant with Standards</td>
<td>Comments</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>5.1</td>
<td>Compliance with the Data Protection Act and data security issues assessed</td>
<td>Yes</td>
<td>The applicant confirmed that participants’ names and consent forms will be stored at the University. The participants’ names will be stored separately from the study data.</td>
</tr>
<tr>
<td>5.2</td>
<td>CTIMPS – Arrangements for compliance with the Clinical Trials Regulations assessed</td>
<td>Not Applicable</td>
<td>No comments</td>
</tr>
<tr>
<td>5.3</td>
<td>Compliance with any applicable laws or regulations</td>
<td>Yes</td>
<td>No comments</td>
</tr>
<tr>
<td>6.1</td>
<td>NHS Research Ethics Committee favourable opinion received for applicable studies</td>
<td>Yes</td>
<td>The REC favourable Opinion letter has been issued.</td>
</tr>
<tr>
<td>6.2</td>
<td>CTIMPS – Clinical Trials Authorisation (CTA) letter received</td>
<td>Not Applicable</td>
<td>No comments</td>
</tr>
<tr>
<td>6.3</td>
<td>Devices – MHRA notice of no objection received</td>
<td>Not Applicable</td>
<td>No comments</td>
</tr>
<tr>
<td>6.4</td>
<td>Other regulatory approvals and authorisations received</td>
<td>Not Applicable</td>
<td>No comments</td>
</tr>
</tbody>
</table>

**Participating NHS Organisations in England**

*This provides detail on the types of participating NHS organisations in the study and a statement as to whether the activities at all organisations are the same or different.*
There are two site types for this study, PIC sites and research sites.

**Site type 1: PIC sites:** PIC sites are responsible for displaying study posters. **Please note** that the use of these sites have been approved in principal as the activities which will be undertaken by these sites are clear (display of a study poster only), however the details of these sites are currently unknown. It will be the Chief Investigator’s responsibility to inform these sites about the study when these sites have been confirmed.

**Site type 2: Research sites:** Responsible for activities as listed in the Protocol.

Study documents will not be shared with participating NHS organisations (PIC sites) in England because the only involvement of the PICs will be to display the study posters. No specific arrangements are expected to be put in place at each organisation to deliver the study.

The Chief Investigator or sponsor should share relevant study documents with participating NHS organisations (research sites) in England in order to put arrangements in place to deliver the study. The documents should be sent to both the local study team, where applicable, and the office providing the research management function at the participating organisation. For NIHR CRN Portfolio studies, the Local LCRN contact should also be copied into this correspondence. For further guidance on working with participating NHS organisations please see the HRA website.

If chief investigators, sponsors or principal investigators are asked to complete site level forms for participating NHS organisations in England which are not provided in IRAS or on the HRA website, the chief investigator, sponsor or principal investigator should notify the HRA immediately at hra.approval@nhs.net. The HRA will work with these organisations to achieve a consistent approach to information provision.

**Confirmation of Capacity and Capability**

This describes whether formal confirmation of capacity and capability is expected from participating NHS organisations in England.
Participating NHS organisations in England (Research sites) will be expected to formally confirm their capacity and capability to host this research.

- Following issue of this letter, participating NHS organisations in England may now confirm to the sponsor their capacity and capability to host this research, when ready to do so. How capacity and capability will be confirmed is detailed in the Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria) section of this appendix.
- The Assessing, Arranging, and Confirming document on the HRA website provides further information for the sponsor and NHS organisations on assessing, arranging and confirming capacity and capability.

The HRA has determined that participating NHS organisations in England (PIC sites) are not expected to formally confirm their capacity and capability to host this research, because the only involvement of the PICs will be to display the study posters.

- The HRA has not informed the relevant research management offices that you intend to undertake the research at their organisation. However, you should still support and liaise with these organisations as necessary.
- Following issue of the Letter of HRA Approval the sponsor may commence the study at these organisations when it is ready to do so.
- The document “Collaborative working between sponsors and NHS organisations in England for HRA Approval studies, where no formal confirmation of capacity and capability is expected” provides further information for the sponsor and NHS organisations on working with NHS organisations in England where no formal confirmation of capacity and capability is expected, and the processes involved in adding new organisations. Further study specific details are provided the Participating NHS Organisations and Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria) sections of this Appendix.

Principal Investigator Suitability

This confirms whether the sponsor position on whether a PI, LC or neither should be in place is correct for each type of participating NHS organisation in England and the minimum expectations for education, training and experience that PIs should meet (where applicable).
There are two site types for this study, PIC sites and research sites.

**Site type 1: PIC sites:** A key contact would be expected to display the study posters on site.

**Site type 2: Research sites:** A key contact would be expected to publicise the project to patients attending the weekly surgery for individuals experiencing homelessness. If an individual expresses interest in participating, the key contact will direct them to the external research team (who will be attending the weekly surgeries during the recruitment period) to schedule a session for data collection.

A Principal Investigator (PI) would not be expected as all study activities will be undertaken by the external research team.

A Local Collaborator (LC) would be expected at each participating NHS organisation to facilitate the access on site for the external team and access to a meeting room if required.

GCP training is not a generic training expectation, in line with the HRA statement on training expectations.

---

**HR Good Practice Resource Pack Expectations**

(*This confirms the HR Good Practice Resource Pack expectations for the study and the pre-engagement checks that should and should not be undertaken*).

Where arrangements are not already in place, external staff undertaking any of the research activities listed in A18 or A19 of the IRAS form, would be expected to obtain an honorary research contract. This would be on the basis of a Research Passport (if university employed) or an NHS to NHS confirmation of pre-engagement checks letter (if NHS employed). These should confirm standard DBS checks and occupational health clearance.

---

**Other Information to Aid Study Set-up**

(*This details any other information that may be helpful to sponsors and participating NHS organisations in England to aid study set-up.*)

The applicant has indicated that they do not intend to apply for inclusion on the NIHR CRN Portfolio.
Research Protocol

Title: An exploration of the neuropsychological needs of individuals experiencing homelessness

Applicant/Chief Investigator (CI): Cormac Duffy (trainee clinical psychologist – Lancaster University)

Supervisors: Dr Pete Greasley, (Researcher/lecturer - Lancaster University), Dr Ste Weatherhead (Clinical tutor – Liverpool University; Clinical Neuropsychologist - XXXX), Dr Martin Whiteford (Researcher – Liverpool University).

Contact Details:

c.duffy1@lancaster.ac.uk

p.greasley@lancaster.ac.uk

Stephen.weatherhead@liverpool.ac.uk

Martin.Whiteford@liverpool.ac.uk
Research Rationale

A growing body of research indicates a higher rate of cognitive impairment in those experiencing homelessness compared to the general population (Burra, Stergiopoulos, & Rourke, 2009) with some estimates being as high as 80% (Spence, Stevens, & Parks, 2004). In spite of this, relatively little is known about the cognitive functioning of those experiencing homelessness compared to the associated socioeconomic, psychiatric, and medical factors (Solliday-McRoy, Campbell, Melchert, et al., 2004). There are a variety of issues connected with experiencing homelessness which can contribute to cognitive deficits such as enduring mental health difficulties, substance misuse, and brain injury (BI) (Backer & Howard, 2007; Seidman, Caplan, Tlomiczenko et al., 1997). Studies indicate that BI in those experiencing homelessness is particularly common (Topolovec-Vranic et al., 2012). However, as with the level of cognitive impairment, a paucity of research coupled with methodological challenges in this area mean it is difficult to determine a precise figure for BI in this population. Two UK studies estimate that the prevalence of traumatic BI in those experiencing homelessness is 46% and 48% respectively (Bremner et al., 1996; Oddy et al., 2012); when alcohol or substance related BI and dementias are considered, this figure increases further.

Together this body of literature indicates that a substantial proportion of individuals experiencing homelessness also experience cognitive impairment (Burra, Stergiopoulos, & Rourke, 2009; Spence, Stevens, & Parks, 2004). Further investigation is now required to advise service providers how to meet the needs of this group. An exploration of cognitive functioning and homelessness needs to address the methodological challenges in terms of measurement and identification (Spence, Stevens, & Park, 2004; Topolovec-vranic et al., 2012).
Firstly, a reliable tool for assessing cognitive functioning is key. Currently, the most common measure of functioning used while researching cognition and homelessness has been the Mini Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975). The MMSE is a brief tool commonly used to screen for dementia. It was not developed to provide a detailed account of a person’s cognitive abilities and has limited faculty in identifying focal cognitive difficulties (Fichter, Koniarczyk, & Greifenhagen, 1996). Furthermore, in one study the MMSE failed to detect over a half of individuals considered to have a cognitive impairment by a battery of neuropsychological assessments (Bremner, Duke, & Nelson, et al., 1996). When a more thorough cognitive assessment such as the Repeatable Battery for the Assessment of Neurological Status (RBANS) (Randolph, Tierney, Mohr, & Chase, 1998) is employed, it is possible to highlight the areas of functioning in which a person may experience difficulty. This information can then be used to tailor specific support for the individual, which could involve the development of individual strategies to compensate for these impairments and inform the approach of service-providers.

The second issue relates to the reliance of single self-report questions to determine whether an individual has experienced a BI (e.g. have you ever experienced a head injury?). Research indicates that this approach can underreport BIs by up to 20% (Diamond, Harzke, Magaletta, Cummins, & Frankowski, 2007). Validated screening tools such as the Brain Injury Screening Index (BISI) provide a structured approach for eliciting a person’s brain injury history and have a better chance at identifying whether they are likely to have experienced one. However, while validated tools are more reliable than a single question, their identification of a possible BI should be objectively supported by information from an individual’s health records which is not subject to recall biases.
Thirdly, another significant methodological weakness present in research is limited samples, with participants often recruited from single sites that are not representative of the diversity of those experiencing homelessness (Topolovec-vranic et al., 2012; Andersen et al., 2014).

This study seeks to build and improve upon existing research by gathering detailed data from people experiencing homelessness. Data will be collected via a validated brain injury screening tool (Brain Injury Screening Index - BISI) and neurocognitive assessment (RBANS), a questionnaire exploring health behaviours and service use, and participant health records. The aim is to provide a detailed account of the neuropsychological needs of a sample of individuals experiencing homelessness.

**Community Consultation**

To inform the procedure and materials used in the project the CI twice met with a local service-user group made up of individuals with lived-experience of homelessness and other related issues. Some professionals working in the field including a commissioner from the Liverpool clinical commissioning group were also in attendance. They reviewed the participant materials advising that they were appropriate for the individuals the study is hoping to recruit. They advised that it will be challenging to recruit this sample and that there needs to be minimal barriers in place for individuals to participate. They advised promoting the project and completing data collection sessions in several services that support those experiencing homelessness. In particular they recommended services in which people are based throughout the day such as those conducting training courses. Two services have already agreed to support the study and the research supervision team are in discussions with other services. These are all non-
NHS services provided by charities or independent organisations. The same approach to data collection including risk management would be applied across all settings.

**Method**

**Design**

The study will adopt a cross-sectional quantitative design to develop a neuropsychological profile of individuals experiencing homelessness. All data (apart from that gathered from health records) will be collected during a single assessment session with the participant.

**Setting**

The project will be conducted at services for individuals experiencing homelessness in XXXXXXX. The research supervision team have already made agreements with two services to provide facilities and support for data collection. These are XXXXXXXX, which is an accommodation and support service, and XXXXXXX, which is a GP practice in XXXXX. In line with the community consultation the project is in discussions with other similar services to invite their service-users to participate.

**Participants**

The study is aiming to recruit 30-40 participants during the data collection period which is expected to last for approximately two months. The only other study (Andersen et al., 2014) that employed the RBANS with this population had a sample size of 34 participants. As such this sample size is considered by the research supervision team to be appropriate to provide an insight into the neuropsychological functioning of a cross-section of people experiencing homelessness. Previous research and the lack of studies investigating cognitive functioning,
brain injury, and homelessness indicate that 30-40 participants will be sufficient. Also from a time and resource perspective this is the maximum sample from whom data could be collected in the CI’s role as a trainee clinical psychologist completing a doctoral thesis.

Participants will be recruited from services supporting individuals experiencing homelessness in Liverpool. Previous research indicates that recruitment can be challenging due to a variety of issues including participants’ lack of a permanent address. To maximise the potential to recruit the above sample size the study will recruit from multiple services. This will also support a representative sample as it is not reliant on a single referral source. Recruiting from accommodation services such as XXXXXXXX can support the building of relationships with residents who may be interested in participating. By recruiting from XXXXXXXX the project will support the participation of individuals who are not currently housed. Other services will similarly support a diverse sample.

XXXX is a 100 bed accommodation and support service. All those accommodated by the XXXX will be invited to participate in the project. XXXXXXXX GP Practice has a dedicated weekly surgery for individuals experiencing homelessness with whom the research supervision team have links. Approximately 750 individuals are registered as homeless at the practice (this may include some of those accommodated by XXXXXXXX). Participants will need to be registered with the practice in order to provide consent to access their health records. If individuals want to participate who are not registered they will be supported to register with XXXXXXXX. Participants recruited from XXXXXXXX Health will need to have attended the dedicated surgery during the recruitment period (individuals will not be contacted unless explicit consent to do so has been provided). If unmet needs are identified during data collection, the
A participant can be referred (with consent) to an appropriate service (liaising with the participant’s GP as appropriate).

**Inclusion Criteria**

Participants must be currently experiencing homelessness and aged 18 years or older; there will be no upper age limit for participation. In line with previous research, participants will be considered homeless if they have been living at a hostel within the last seven days and do not have a home of their own (Hwang et al., 2008). Individuals not housed by any accommodation service (e.g. sleeping outdoors) will also be considered to be experiencing homelessness. These will be recruited if they attend the Homeless Surgery.

**Exclusion Criteria**

If an individual does not have the capacity to consent to participation or continue in the assessment they will be excluded from the research. If capacity is in question, it will be assessed by the CI, a trainee clinical psychologist, who has experience supporting individuals experiencing homelessness and cognitive difficulties. This assessment will be informed by guidance provided by the British Psychological Society (2006) and the framework developed by Church and Watts (2007). The CI has assessed and monitored capacity during interviews in previous research. At the start of the session capacity will be assessed using the participant information sheet, consent form, and clinical judgement. The CI will continue to monitor the participant’s capacity throughout data collection. Should the participant be considered to lose capacity during data collection the CI will discuss stopping the interview with them. The CI will consult a member of the supervisory team and proceed appropriately.
Recruitment Strategy

The project poster will be advertised in appropriate services throughout Liverpool city. It will direct potential participants to drop-in sessions at the XXXXXXXX, XXXXXXXX or another relevant service. This will support individuals experiencing homelessness accessing a variety of different services to participate.

The CI will meet with staff at recruitment venues to explain the project, answer questions, and provide them with participant information sheets and sample consent forms to allow them to publicise the project to their respective service-users. The CI will seek to host an information event in each venue inviting both staff and service-users to attend. All interested parties particularly potential participants will be invited to learn about the project and ask any questions they may have. The recruitment procedure for each recruitment centre is as follows:

XXXXXXX. Staff will discuss the project directly with new and existing service-users as they come into contact with them during the recruitment period. There will also be information sheets and posters in the common areas of the XXXXXXXX advertising the project. If an individual expresses an interest in participating they can inform staff who can then support them to choose a scheduled time-slot to participate. A number of slots will be set up across a number of days. The CI will also have dedicated “drop-in” sessions whereby they will be available onsite to discuss the project with service-users wherein they can also express interest in participating and choose a time-slot. The benefit of recruiting from the XXXXXXXX is that service-users will be living at the service which can support participation.

XXXXXXX. Staff will publicise the project directly to patients attending the weekly surgery for individuals experiencing homelessness. If an individual expresses interest in participating, staff will direct them to the CI (who will be attending the weekly surgeries during
the recruitment period) to schedule a session for data collection. The study will also be advertised via posters in the common areas of the service.

XXX is a community interest company that will be providing neuropsychological support to service-users at the two recruitment venues. It is run by a member of the study’s supervision team (Dr Weatherhead) and the CI is on placement with the service. The study’s assessment tools are also used by the service. As such XXXX team members will make their service-users aware of the study (using the information sheet) so that they can choose if they want to make their data available to the study. If service-users choose to participate the CI or a member of the supervision team will support them to complete the consent form.

As outlined above the CI is following the recommendations of the community consultation and discussing with other service providers as to whether they could facilitate the participation of their service-users. This would need to meet the same criteria as the above venues. This includes a quiet room for data collection and on-site staff who can support risk management procedures.

**Data Collection**

Data collection will take place in a private room at either X, X, Liverpool University, or another appropriate service. Data will be collected by the CI of the project. All self-report data will be collected in a single session lasting approximately one hour. Data will be collected via the Brain Injury Screening Index (BISI), the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), a health & service-use questionnaire, and participant health records (with consent from the participants and the GP practice). A test for premorbid functioning will also be employed.
**Cognitive Functioning.**

The RBANS cognitive assessment assesses immediate, and delayed memory, attention, language, and visuospatial/constructional skills (Randolph et al., 1998). Participants receive scores in the form of percentile ranks for each of these subscales as well as an overall percentile rank. Scores can be compared to normed percentiles indicating how participants’ scores compare to the general population. If a person performs significantly low compared to the norm, this would indicate further assessment and possibly neuropsychological support would be needed. The RBANS has been chosen as it can be applied in a single session, is not excessively time-demanding (approximately 35 minutes) and is a measure of neurocognitive functioning used widely in neuropsychological services.

**Brain Injury History**

The adapted Brain Injury Screening Index (BISI) is a structured tool which screens for brain injury using a number of questions. It has been adapted to include questions regarding dementia and alcohol/substance related BI. Higher scores are associated with a higher likelihood of the individual having experienced a severe BI. Scores are divided into the following descriptive categories: no BI, mild BI, moderate BI, severe BI, very severe BI, and extremely severe BI. It has been validated with a number of different populations such as prisoners who are vulnerable to experiencing both a brain injury and homelessness. However, it has yet to be validated specifically for use with individuals who are homeless. To be conservative in our estimate, and in line with previous research in this area, participants identified as having no brain injury or a mild brain injury will be considered a negative screen for brain injury. Those identified as having a moderate or more severe brain injury, will be considered a positive screen.
As such only those with a strong indicator of a BI will be considered as having experienced a BI. This will reduce the potential for false positives. With participants’ consent, the screening for mild BI would be shared with their GP. The BISI takes 10 mins to administer. Consent will also be requested to access participants’ health records via their GP (XXXXXXX Health) to identify any admissions for a BI. This will add independent verification to the self-report data and can identify BIs that participants may have forgotten about. It will also provide an accurate timeline in terms of whether the participant experienced their injury pre/post experiencing homelessness. XXXXXXXX Health are providing the CI with a computer and desk in a secure room at their practice to access this data.

**Health/Wellbeing/Service Use.**

The self-report questionnaire participants will be supported to complete will be an adapted form of an outcome measure used by the Healthy Futures initiative. This is an award winning project that supports individuals experiencing homelessness to secure accommodation following discharge from hospital (http://www.derventiohousing.com/what_we_do/healthy-futures.html). The three page questionnaire requests information on the following areas relating to the past year: attendance at different health services (including A&E, GP), interaction with police (arrests, prison), use of mental health services, alcohol and substance use, duration of homelessness, mental health difficulties, disabilities, and employment details. It also includes the OxCAP-MH (Simon et al., 2013) which is a multi-dimensional measure of capability devised and operationalised for assessing outcomes in mental health research. It is a 16 item tool completed by the person alone or with a clinician/researcher with higher scores indicating better capabilities.
Analysis

The primary aim of the analysis will be to provide a neuropsychological profile of a cross-section of people experiencing homelessness and their interaction with services. Cognitive functioning will be described in terms of percentile scores across the five domains of the RBANS as well an overall score (interval data). BI status will be described via nominal data: a positive or negative indication of a BI (derived from the BISI and health records) as well as a categorical classification of likely type of BI (traumatic brain injury, dementia, or alcohol/substance related). The questionnaire will provide ratio data regarding the previous year of the participants’ life. This includes their interaction with physical and mental health services, the police, alcohol/substance use, sleeping circumstances, and health-related quality of life. Additionally the profile will include age and demographic information (nominal data).

The study will also seek to explore whether relationships exist between the different elements making up the profile. It will be explored whether cognitive scores are related to or associated with level of interaction with different services, alcohol/substance use, nights spent in different sleeping situations (for example rough-sleeping/hostels), duration of homelessness, and health-related quality of life. Depending on whether the criteria are met for parametric tests correlations will be conducted using Pearson’s correlation coefficient or Spearman’s rho. Chi square analysis may be used to explore relationships involving nominal data in the questionnaires, or potential categorisation of ordinal/interval data.

A sample of the RBANS and BISI data will be scored by one or more of the study’s supervisors for quality assurance purposes. All analysis will be conducted using the Statistical Package for Social Sciences (SPSS).
Data Management Plan (DMP)

The data are collected on paper and then transferred to a spreadsheet on the CI’s password protected university account which is in an encrypted environment maintained by the university. This will be completed using Lancaster University’s Virtual Private Network (VPN) which is a secure system for remotely accessing university accounts. This will be completed either at the recruitment venues or the CI’s home as soon as possible after interview. Hard copies of the data will be anonymised using participant numbers and no paper documents will have a participant’s name on them. A password protected word document containing the names and corresponding participant numbers will be stored on this secure account, to which only the CI has access. Prior to this they will be stored in a secure cabinet on the premises of the recruitment venue. Only the CI will have full access to all materials. The supervisors will have access to the data for quality purposes.

Long-Term Storage of Data

Following completion of the study the data will be stored securely by the doctorate in clinical psychology programme at the University of Lancaster for a period of at least ten years. All data will be saved electronically. Paper copies of all documents will then be securely destroyed. All data will be saved in password-protected file space on the university server in an encrypted environment. Following the researcher's completion of the doctorate access to the data will be transferred to the research coordinator in the division of clinical psychology who will have access to the information.

Ethical concerns

To ensure the safety of the CI during data collection all data will be collected onsite at the recruitment centres. The CI will follow the local lone working and risk management procedures.
Staff at the recruitment venues will be aware of the time-slot for each participant. If a slot runs over staff can check if there are any issues.

Capacity will need to be assessed and carefully monitored, particularly if there is a query whether the participant is under the influence of alcohol/substances at the time of assessment. The CI will assess whether the individual has capacity to consent to participation and this will be monitored throughout the session. It is the ethos of this project that if an individual has consumed alcohol but is able to demonstrate capacity to consent this offers the opportunity to include individuals who would not normally participate in research. If the participant is being assessed under conditions representative of their usual cognitive functioning then this data serves as an appropriate baseline.

It is important that the participants gain something for their time rather than just being assessed. As such the CI will offer an accessible summary of their results which could be shared with their GP. For those with a head injury we will also offer to facilitate their obtainment of a Brain Injury ID card which is provided by the brain injury charity Headway. In the case of the assessment identifying any unmet needs for which the person needs support the CI will seek consent to liaise with the participant’s GP for an appropriate referral to be made.

Timescale for Research

<table>
<thead>
<tr>
<th>Date Range</th>
<th>Activity</th>
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<tr>
<td>Sept 2017- Dec 2017</td>
<td>Data collection and analysis.</td>
</tr>
<tr>
<td>Dec 2017</td>
<td>Literature review and method – 1st draft</td>
</tr>
<tr>
<td>Nov-Feb 2018</td>
<td>Analyse data</td>
</tr>
<tr>
<td>Feb 2018</td>
<td>First full draft including results and discussion</td>
</tr>
<tr>
<td>April 2018</td>
<td>Research paper 2nd draft</td>
</tr>
<tr>
<td>April 2018</td>
<td>Critical appraisal 1st draft</td>
</tr>
<tr>
<td>Time Period</td>
<td>Activity Description</td>
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<td>---------------------</td>
<td>-----------------------------------------------</td>
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<tr>
<td>May 2018</td>
<td>Critical appraisal 2nd draft</td>
</tr>
<tr>
<td>June-July 2018</td>
<td>Viva</td>
</tr>
<tr>
<td>July – Sept 2018</td>
<td>Prepare papers for submission to journals</td>
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References


Screening for traumatic brain injury in an offender sample: a first look at the reliability and validity of the Traumatic Brain Injury Questionnaire. *The Journal of head trauma rehabilitation, 22*(6), 330. DOI: 10.1097/01.HTR.0000300228.05867.5c


https://doi.org/10.1016/0022-3956(75)90026-6


doi:10.1089/neu.2014.3387


doi:10.1076/jcen.20.3.310.8230


capability approach for outcome measurement in mental health research. *Social Science & Medicine, 98*, 187-196. DOI: https://doi.org/10.1016/j.socscimed.2013.09.019


Appendices

Appendix A: Poster

Lancaster University

Homelessness Research Project:

How are your thinking skills?

I am Cormac Duffy. I am training to become a psychologist.

I want to find out if homelessness affects a person’s thinking skills, like remembering and paying attention to things. I am meeting with people affected by homelessness at different services in the city.

Your experience is important and I would like to meet with you.

Want to take part or know more?

- Come to XXXXXXXX GP’s Homeless Clinic (Thurs 12.30-2.30pm)
• Tell a member of staff who will let me know you’re interested.
• Contact me directly or with someone’s help:
  Call me: _______________; Email me: c.duffy1@lancaster.ac.uk
Appendix B: Participant Information Sheet

Participant Information Sheet

Exploring Homelessness & Thinking Skills

What is this project about?

I want to find out if homelessness affects a person’s thinking skills, like remembering and paying attention to things. This project will help services to support people experiencing homelessness better.

Do I have to take part?

You don’t have to talk to me if you don’t want to. If you do decide to take part, the information you provide will be anonymous, your name will not appear anywhere. Your decision will not affect the care you receive.

What would I have to do?

You would meet with me about an hour and we will complete an assessment relating to thinking skills, and two short questionnaires relating to health, service-use, and history of head injuries. I will also ask
permission to check your health records to see if you have ever been treated for a head injury.

**Where would this happen?**

We would speak in a private room at a Liverpool city service supporting individuals who have experience of homelessness. A number of different services are taking part.

**What happens after I take part?**

I will write a report about the project. This will be read by some University teachers. It might also be in a psychology article, so that other people can read it. The university will keep the anonymous information from the project safely stored for 10 years.

**Who will know the results of my assessment?**

I will score all the assessments so only I will know your personal results. My supervisors will have access to some of the results but your name will not be on them only your assigned number. I will offer to share the results with you and your GP.

**Can anything bad happen if I take part?**
Usually people find different parts of the assessment challenging. The results of the assessments may also indicate details about your thinking skills of which you were unaware. This can be upsetting. When we meet together we will think of the best way to support you if this happens.

**Are there any benefits to taking part?**

You can choose to receive the results of the assessment we complete, I can also share them with your GP. If you may benefit from one I can also help you to get a Brain Injury ID card from Headway. The results of the study can inform how best to support people experiencing homelessness.

**Can I change my mind about taking part?**

Yes, you can end our session at any time. You can also choose to remove your data from the study for one month after we meet. If the report gets published I will not be able to delete anything printed but there will be no names and no individual scores printed so no one will know your personal results.

**What do I do if I want to take part?**
You can tell a member of staff at XXXXXXXX Health or the Liverpool XXXXXXXX that you are interested in taking part and they can provide you with a time-slot for us to meet that suits you.

OR

You can approach me directly during the drop-in times advertised at Liverpool XXXXXXXX or during the homeless surgery at XXXXXXXX which is every XXXXX.

OR

Contact me directly or with the help of someone:

Phone: __________________

Email: c.duffy1@lancaster.ac.uk
Post: Clinical Psychology Programme, Division of Health Research, Furness College, Lancaster University, Lancaster, LA1 4YG

Who can I contact if I get upset following taking part in the project?
You can contact Lancaster University who are sponsoring the project. A useful person to speak to is Roger Pickup. Roger has lots of experience in research and will listen to what you have to say. You can email or ring Roger using the details below.
E-mail: r.pickup@lancaster.ac.uk  Phone: 01524 59 3746
Research title: Exploring Homelessness & Cognition
Participant consent form
Please put your initials in the box if you agree

I have read the information sheet for this project and understand what it says.

I know that the information I provide will be used for research and will be saved in a safe location to which only the researcher has access. I know that my name will not appear on any of my results only my participant number.

I know that this involves accessing my health records. I know that this will be completed securely and sensitively. Only information relevant to the research will be accessed.

I know that what I say in the interview will be kept anonymous, unless I tell the researcher (Cormac) that somebody, including me, might be at risk of getting hurt.
I know that the researcher (Cormac) might publish the information provided but that all my details will be kept anonymous.

I know that I can change my mind about taking part at any point, and that this won’t affect my care. I know that some of the information already provided may still be used in the research.

I would like a member of the XXX team to contact me to discuss possible support needs highlighted during my participation.

For XXX service-users only:
I would like my relevant assessment data stored by XXXX to be used as part of this study.

I agree to take part in the study.

Participant
Signed____________________________________________
Date______________________________________________

Researcher
Signed____________________________________________
Date______________________________________________
Appendix D Debriefing sheet

DEBRIEFING SHEET

This project wants to find out about homelessness and thinking skills. Thinking skills include paying attention, language and memory. It wants to find out if there is a relationship between these skills and experiencing homelessness. It will also explore whether these skills are linked with having a head injury or other health issues.

I, Cormac, will offer to share the results of the assessments with you and your GP. Together we can arrange a time that suits you to do this. This will take place at ________________________________.

If you feel upset after taking part please speak with your chosen person who is ________________, a member of staff at the service, or your GP.

Cormac will come back to the service when the project is finished and invite people to hear about what the project found out.

If you want to complain or speak to someone from Lancaster University about the research you can contact Roger Pickup, Associate Dean for Research at Lancaster University.

E-mail: r.pickup@lancaster.ac.uk Phone: 0152 4593 746

Thank you for taking part in the study.
Appendix E Participant Questionnaire

### Service Use & Health Questionnaire
(to be completed by chief investigator)

**PART A – SERVICE USER INFORMATION**

<table>
<thead>
<tr>
<th>Date interviewed:</th>
<th>Date of birth:</th>
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**Gender:** Male □ Female □ Transgender □ Other

**Where were you born?**
- In the UK □
- North America & Oceania □
- Western Europe (non UK) □
- Eastern Europe □
- Central Europe □
- Sub Saharan Africa □
- North Africa □
- Latin America & Caribbean □
- East Mediterranean □
- East Asia & Pacific □
- South East Asia □
- South Asia □

**Ethnicity:**
- White □
- Black – Caribbean □
- Black – African □
- Black – other □
- Indian □
- Pakistani □
- Bangladeshi □
- Chinese □
- Mixed/other □

**Sexual Orientation**
- Lesbian □
- Gay □
- Bisexual □
- Heterosexual □
- Prefer not to say □
- Other __________

**Registered with GP:**
- No □
- Yes local GP □
- Yes not local GP □

**In the last year,** how many times has the individual received the following assistance?

<table>
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<th></th>
<th>None</th>
<th>1</th>
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<td>Hospital outpatient clinic</td>
<td>None</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalisation</td>
<td>None</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GP visits</td>
<td>None</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Prison: in the last year have you ever:**

**Been in prison?**
- Yes □
- No □

**How many times has the person had contact with the following police/crime services?**

<table>
<thead>
<tr>
<th></th>
<th>None</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrests by police</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nights in prison</td>
<td>None</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magistrate court attendance</td>
<td>None</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crown court attendance</td>
<td>None</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nights in police custody</td>
<td>None</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If more please specify:
### Mental Health: in the last year, how many times has the person received the following assistance?

<table>
<thead>
<tr>
<th>Service</th>
<th>None</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental health hospital admissions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental health community provision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local authority funded care home for people with mental health problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local authority funded day care for people with mental health problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support from a brain injury service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total number of nights**

- None
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10+

### Drug use: has the person ever:

**Injected heroin?**

- No
- Yes (< 1 yr)
- Yes (> 10 yrs)

**Injected crack/cocaine?**

- No
- Yes (< 1 yr)
- Yes (> 10 yrs)

**Smoked heroin?**

- No
- Yes (< 1 yr)
- Yes (> 10 yrs)

**Smoked crack/cocaine?**

- No
- Yes (< 1 yr)
- Yes (> 10 yrs)

**Shared needles?**

- No
- Yes

**Cannabis**

- No
- Yes (< 1 yr)
- Yes (> 10 yrs)

**Mephedrone**

- No
- Yes (< 1 yr)
- Yes (> 10 yrs)

### IN THE PAST 30 DAYS

**How many days in the past 30 days have you consumed alcohol?**

**In the last year,**

**Has the individual been receiving opioid substitute prescriptions (e.g. methadone)?**

- No
- Yes (wks):
- More:

**How many one-to-one contacts has the person had with a drug/alcohol treatment team?**

- No
- Yes:
- More:

**How many group sessions has the person had with a drug/alcohol treatment team?**

- No
- Yes:
- More:

**How many nights has the person spent in detox and rehab centre?**

- No
- Yes:
- More:
**Social care:** in the last year, how many times has the person received the following assistance?

<table>
<thead>
<tr>
<th>Service</th>
<th>No</th>
<th>Yes</th>
<th>No. of times</th>
</tr>
</thead>
<tbody>
<tr>
<td>A social care assessment</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>A consultation with a social worker</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Care Home</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

**Housing:** Please indicate the number of nights that in the last year the person has spent in the following accommodation types:

<table>
<thead>
<tr>
<th>Accommodation Type</th>
<th>No</th>
<th>Yes</th>
<th>No. of nights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slept rough</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Lived in a hostel</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Lived in a squat or on someone’s floor or sofa?</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Own social tenancy</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Own private rented sector tenancy</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Room in shared private rented sector property</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
Duration of Homelessness

How long has your current episode of homelessness lasted? ________________

In total how long have you considered yourself homeless throughout your life?

________________________________________________________________________

At what age did you first experience homelessness? ________________

Mental Health

Would you consider yourself to experience any mental health difficulties?

Yes ☐  No ☐

If yes, how would you describe your difficulties

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Disabilities

Would you consider yourself to experience any disabilities (physical or otherwise)?

Yes ☐  No ☐

If yes, how would you describe these disabilities

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
PART B – Employment

In the past year which best describes your employment status:

Unemployed □

Part-time employed □

Full-time employed □

Do you receive any state benefits? Yes □  No □

If yes, which benefits?

...........................................................................................................................................
# PART C – QUALITY OF LIFE

**OxCAP-MH**

This questionnaire asks about your overall quality of life.

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Does your health in any way limit your daily activities, compared to most people of your age?</td>
<td>□ Always  □ Most of the time  □ Some of the time  □ Hardly ever  □ Never</td>
</tr>
<tr>
<td></td>
<td>[Please tick one]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Are you able to meet socially with friends or relatives?</td>
<td>□ Always  □ Most of the time  □ Some of the time  □ Hardly ever  □ Never</td>
</tr>
<tr>
<td></td>
<td>[Please tick one]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>In the past 4 weeks, how often have you lost sleep over worry?</td>
<td>□ Always  □ Most of the time  □ Some of the time  □ Hardly ever  □ Never</td>
</tr>
<tr>
<td></td>
<td>[Please tick one]</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>In the past 4 weeks, how often have you been able to enjoy your recreational activities?</td>
<td>□ Always  □ Most of the time  □ Some of the time  □ Hardly ever  □ Never</td>
</tr>
<tr>
<td></td>
<td>[Please tick one]</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>How suitable or unsuitable is your accommodation for your current needs?</td>
<td>□ Very suitable  □ Fairly suitable  □ Neither suitable nor unsuitable  □ Fairly unsuitable  □ Very unsuitable</td>
</tr>
<tr>
<td></td>
<td>[Please tick one]</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>------</td>
<td></td>
</tr>
</tbody>
</table>
| 6        | Please indicate how safe you feel walking alone in the area near your home:  
[Please tick one] |
|          | □ Very safe  
□ Fairly safe  
□ Neither safe nor unsafe  
□ Fairly unsafe  
□ Very unsafe |
| 7        | Please indicate how likely you believe it to be that you will be assaulted in the future (including sexual and domestic assault):  
[Please tick one] |
|          | □ Very likely  
□ Fairly likely  
□ Neither likely nor unlikely  
□ Fairly unlikely  
□ Very unlikely |
| 8        | How likely do you think it is that you will experience discrimination?  
[Please tick one] |
|          | □ Very likely (Go to Q8a)  
□ Fairly likely (Go to Q8a)  
□ Neither likely nor unlikely (Go to Q9)  
□ Fairly unlikely (Go to Q9)  
□ Very unlikely (Go to Q9) |
| 8a       | On what grounds do you think it is likely that you will be discriminated against?  
[Please tick up to three] |
|          | □ Race/ethnicity  
□ Gender  
□ Religion  
□ Sexual orientation □ Age  
□ Health or disability (incl. mental health) |
| 9        | Please indicate how strongly you agree or disagree with the following statements:  
[Please tick one] |
|          | □  
□ Neither  
□  
□ |
<p>| 9a       | I am able to influence decisions affecting my local area. |</p>
<table>
<thead>
<tr>
<th>9b</th>
<th>I am free to express my views, including political and religious views.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9c</td>
<td>I am able to appreciate and value plants, animals and the world of nature.</td>
</tr>
<tr>
<td>9d</td>
<td>I respect, value and appreciate people around me.</td>
</tr>
<tr>
<td>9e</td>
<td>I find it easy to enjoy the love, care and support of my family and friends.</td>
</tr>
<tr>
<td>9f</td>
<td>I am free to decide for myself how to live my life.</td>
</tr>
<tr>
<td>9g</td>
<td>I am free to use my imagination and to express myself creatively (e.g. through art, literature, music, etc.).</td>
</tr>
<tr>
<td>9h</td>
<td>I have access to interesting forms of activity (or employment).</td>
</tr>
</tbody>
</table>
Amendment Approval Letter & Application

Mr Cormac Duffy  
Trainee Clinical Psychologist  
Lancashire Care NHS Foundation Trust  
Clinical Psychology Department  
Division of Health Research  
Lancaster University  
LA1 4YG

04 October 2017

Dear Mr Duffy

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

The committee found no ethical issues with this amendment.

Approved Documents

The documents reviewed and approved at the meeting were:

<table>
<thead>
<tr>
<th>Document</th>
<th>Version</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notice of Substantial Amendment (non-CTIMP)</td>
<td>1</td>
<td>17 October 2017</td>
</tr>
<tr>
<td>Research protocol or project proposal</td>
<td>4</td>
<td>17 October 2017</td>
</tr>
<tr>
<td>Validated questionnaire [OxCAP-MH English]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

Working with NHS Care Organisations
Sponsors should ensure that they notify the R&D office for the relevant NHS care organisation of this amendment in line with the terms detailed in the categorisation email issued by the lead nation for the study.

Mrs Julie Brake Chair, NHS Liverpool Central Research Ethics Committee

E-mail: nrescommittee.northwest-liverpoolcentral@nhs.net

*Enclosures: List of names and professions of members who took part in the review*

*Copy to: Mr Cormac Duffy*
Welcome to the Integrated Research Application System

The integrated dataset required for your project will be created from the answers you give to the following questions. The system will generate only those questions and sections which (a) apply to your study type and (b) are required by the bodies reviewing your study. Please ensure you answer all the questions before proceeding with your applications.

Please complete the questions in order. If you change the response to a question, please select ‘Save’ and review all the questions as your choice may have affected subsequent questions.

Please enter a short title for this project (maximum 70 characters)
The neuropsychological needs of individuals experiencing homelessness

1. Is your project research?
- Yes
- No

2. Select one category from the list below:
- Clinical trial of an investigational medicinal product
- Clinical investigation or other study of a medical device
- Combined trial of an investigational medicinal product and an investigational medical device
- Other clinical trial to study a novel intervention or randomised clinical trial to compare interventions in clinical practice
- Basic science study involving procedures with human participants
- Study administering questionnaires/interviews for quantitative analysis, or using mixed quantitative/qualitative methodology
- Study involving qualitative methods only
- Study limited to working with human tissue samples (or other human biological samples) and data (specific project only)
- Study limited to working with data (specific project only)
- Research tissue bank
- Research database

If your work does not fit any of these categories, select the option below:
- Other study

2a. Please answer the following question(s):
   a) Does the study involve the use of any ionising radiation?
   - Yes
   - No
   b) Will you be taking new human tissue samples (or other human biological samples)?
   - Yes
   - No
   c) Will you be using existing human tissue samples (or other human biological samples)?
   - Yes
   - No

3. In which countries of the UK will the research sites be located? (Tick all that apply)
   - England
   - Scotland
3a. In which country of the UK will the lead NHS R&D office be located:

- England
- Scotland
- Wales
- Northern Ireland
- This study does not involve the NHS

4. Which applications do you require?

**IMPORTANT:** If your project is taking place in the NHS and is led from England select 'IRAS Form'. If your project is led from Northern Ireland, Scotland or Wales select ‘NHS/HSC Research and Development Offices’ and/or relevant Research Ethics Committee applications, as appropriate.

- IRAS Form
- Confidentiality Advisory Group (CAG)
- Her Majesty's Prison and Probation Service (HMPPS)

For NHS/HSC R&D Offices in Northern Ireland, Scotland and Wales the CI must create NHS/HSC Site Specific Information forms, for each site, in addition to the study wide forms, and transfer them to the PIs or local collaborators.

For participating NHS organisations in England different arrangements apply for the provision of site specific information. Refer to IRAS Help for more information.

Most research projects require review by a REC within the UK Health Departments’ Research Ethics Service. Is your study exempt from REC review?

- Yes
- No

5. Will any research sites in this study be NHS organisations?

- Yes
- No

5a. Are all the research costs and infrastructure costs (funding for the support and facilities needed to carry out research e.g. NHS Support costs) for this study provided by a NIHR Biomedical Research Centre, NIHR Biomedical Research Unit, NIHR Collaboration for Leadership in Health Research and Care (CLAHRC), NIHR Patient Safety Translational Research Centre or a Diagnostic Evidence Co-operative in all study sites?

Please see information button for further details.

- Yes
- No

Please see information button for further details.

5b. Do you wish to make an application for the study to be considered for NIHR Clinical Research Network (CRN) Support and inclusion in the NIHR Clinical Research Network Portfolio?

Please see information button for further details.

- Yes
- No
The NIHR Clinical Research Network provides researchers with the practical support they need to make clinical studies happen in the NHS e.g. by providing access to the people and facilities needed to carry out research “on the ground”.

If you select yes to this question, you must complete a NIHR Clinical Research Network (CRN) Portfolio Application Form (PAF) immediately after completing this project fitter question and before submitting other applications. Failing to complete the PAF ahead of other applications e.g. HRA Approval, may mean that you will be unable to access NIHR CRN Support for your study.

6. Do you plan to include any participants who are children?
   - Yes
   - No

7. Do you plan at any stage of the project to undertake intrusive research involving adults lacking capacity to consent for themselves?
   - Yes
   - No

   Answer: Yes if you plan to recruit living participants aged 16 or over who lack capacity, or to retain them in the study following loss of capacity. Intrusive research means any research with the living requiring consent in law. This includes use of identifiable tissue samples or personal information, except where application is being made to the Confidentiality Advisory Group to set aside the common law duty of confidentiality in England and Wales. Please consult the guidance notes for further information on the legal frameworks for research involving adults lacking capacity in the UK.

8. Do you plan to include any participants who are prisoners or young offenders in the custody of HM Prison Service or who are offenders supervised by the probation service in England or Wales?
   - Yes
   - No

9. Is the study or any part of it being undertaken as an educational project?
   - Yes
   - No

   Please describe briefly the involvement of the student(s):
   The student is completing the study as part of his doctorate in clinical psychology. They will be the Chief Investigator.

9a. Is the project being undertaken in part fulfilment of a PhD or other doctorate?
   - Yes
   - No

10. Will this research be financially supported by the United States Department of Health and Human Services or any of its divisions, agencies or programs?
    - Yes
    - No

11. Will identifiable patient data be accessed outside the care team without prior consent at any stage of the project (including identification of potential participants)?
    - Yes
    - No
### Full title of study:
An exploration of the neuropsychological needs of individuals experiencing homelessness

### Lead sponsor:
University of Lancaster

### Name of REC:
Northwest Liverpool Central

### REC reference number:
17/NW/0509

### Additional reference number(s):
<table>
<thead>
<tr>
<th>Ref. Number</th>
<th>Description</th>
<th>Reference Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>17/NW/0509</td>
</tr>
</tbody>
</table>

### Date study commenced:
04/10/17

### Protocol reference (if applicable), current version and date:
IRAS Project ID: 230238 - Version 3 - 04/08/2017

### Amendment number and date:
First amendment to this study - 17/10/17

### Type of amendment
(a) Amendment to information previously given in IRAS
- [ ] Yes  
- [ ] No
If yes, please refer to relevant sections of IRAS in the “summary of changes” below.
Please see below.

(b) Amendment to the protocol
   • Yes  ○ No

   If yes, please submit either the revised protocol with a new version number and date, highlighting changes in bold, or a document listing the changes and giving both the previous and revised text.
   Revised protocol with new version number and date, with changes highlighted in yellow attached.

(c) Amendment to the information sheet(s) and consent form(s) for participants, or to any other supporting documentation for the study
   • Yes  ○ No

   If yes, please submit all revised documents with new version numbers and dates, highlighting new text in bold.
   No amendments required to any PIS or CF documents. The OxCAP-MH measure is replacing the EQSD measure (which formed section 3 of the non-validated questionnaire). I have removed the EQSD from the questionnaire and attached the OxCAP (due to formatting it is not possible to put them all in the same word document but they will be one document when presented to the participant).

Is this a modified version of an amendment previously notified and not approved?
   • Yes  ○ No

Summary of changes

Briefly summarise the main changes proposed in this amendment. Explain the purpose of the changes and their significance for the study.
If this is a modified amendment, please explain how the modifications address the concerns raised previously by the ethics committee.

If the amendment significantly alters the research design or methodology, or could otherwise affect the scientific value of the study, supporting scientific information should be given (or enclosed separately) indicate whether or not additional scientific critique has been obtained.

The amendment proposed involves replacing the EQSD (in section 3 of the non-validated questionnaire) with the OxCAP-MH. Following discussion with the research support team, other senior clinicians and neuropsychologists in the field as well as appropriate literature, it has come to the attention of the CI that the OxCAP-MH is a more relevant measure of participants’ quality of life compared to the EQSD. It is used widely in research and has substantial supporting research.

I have updated the protocol to reflect this amendment and attached the OxCAP-MH for your review.

Any other relevant information

Applicants may indicate any specific issues relating to the amendment, on which the opinion of a reviewing body is sought.

To date no participants have been recruited so the EQSD has not been used at all in the conduct of the study.
However, recruitment is due to start very soon (next week) and the window for completing it will close in November as this study is part of a thesis being completed for a doctorate in clinical psychology. Due to this time pressure we would appreciate (be hugely grateful) for your support with making this amendment - thanking you in advance!

List of enclosed documents

<table>
<thead>
<tr>
<th>Document</th>
<th>Version</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>Version 4</td>
<td>17/10/2017</td>
</tr>
<tr>
<td>Non-validated Questionnaire</td>
<td>Version 4</td>
<td>17/10/2017</td>
</tr>
</tbody>
</table>
Appendices

Appendix A

Author Guidelines for Journal of Intellectual Disability Research

Content of Author Guidelines:
1. Editorial and Content Considerations
2. Ethical Guidelines
3. Manuscript Types Accepted
4. Preparation of Your Manuscript
5. Submitting Your Manuscript
6. Copyright, Licensing and Online Open
7. Post Acceptance
8. Post Publication

1. EDITORIAL AND CONTENT CONSIDERATIONS

Journal of Intellectual Disability Research is devoted exclusively to the scientific study of intellectual disability and publishes papers reporting original observations in this field. The subject matter is broad and includes, but is not restricted to, findings from biological, educational, genetic, medical, psychiatric, psychological and sociological studies, and ethical, philosophical, and legal contributions that increase knowledge on the treatment and prevention of intellectual disability and of associated impairments and disabilities, and/or inform public policy and practice.

The journal publishes Full Reports, Brief Reports and Systematic Reviews. Mental Health Special Editions are published quarterly. Narrative reviews and hypothesis papers are encouraged but authors should discuss the focus of their review with the Editor in Chief prior to submission to ensure it is appropriate for the journal. Submissions for Book Reviews are also welcomed. Case studies are not published by JIDR.

Journal of Intellectual Disability Research will feature four Annotation articles each year covering a variety of topics of relevance to the main aims of the journal or topics. Senior researchers, academics and clinicians of recognised standing in their field will be invited to write an Annotation for the journal covering an area that will be negotiated with the Editor in Chief, Prof. Chris Oliver, on behalf of the Editorial Team.

Peer Review Process

The acceptance criteria for all papers are the quality and originality of the research and its significance to our readership. Except where otherwise stated, manuscripts are double-blind peer reviewed by two anonymous reviewers and the editor.
Journal of Intellectual Disability Research attempts to keep the review process as short as possible to enable rapid publication of new scientific data. In order to facilitate this process, submitting authors are asked to suggest the names and current e-mail addresses of two potential reviewers whom you consider capable of reviewing your manuscript. In addition to your choice the journal editor will choose one or two reviewers as well. Suggestions will be requested via the submission system.

Authors who wish to appeal the decision on their submitted paper may do so by e-mailing the Editorial Office with a detailed explanation for why they find reasons to appeal the decision.

Plagiarism detection

- The journal employs a plagiarism detection system. By submitting your manuscript to this journal you accept that your manuscript may be screened for plagiarism against previously published works.

- Individual authors and researchers can now check their work for plagiarism before submission - please click here for details.

2. ETHICAL GUIDELINES

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