

A systematic review of cognition in homeless children and adolescents

Randolph W Parks Richard J Stevens Sean A Spence

J R Soc Med 2007;100:46–50

SUMMARY

Objectives The cognitive function of homeless children and adolescents may be overlooked, albeit understandably, when societal interventions focus on their immediate housing needs. Nevertheless, homelessness might be hypothesized to carry many risks for the developing mind and brain. We wanted to discover whether this hypothesis had been tested previously.

Design A systematic review to examine whether cognitive impairments were reported in homeless children and adolescents.

Setting Objective, systematic review of standard databases, examined by key word searches.

Participants Children and adolescents.

Main outcome measures Formal assessments of cognition.

Results We found that in spite of there being many homeless children in the world, fewer than 2000 have been assessed cognitively and reported in the literature. Yet when compared with those who are domiciled, these children tend to have lower intellectual functioning and decreased academic achievement. Furthermore, adolescents evince cognitive impairments in the contexts of drug, physical, and sexual abuse.

Conclusions We suggest that cognitive and mental health screening be incorporated into those intervention programs deployed to facilitate societal reintegration of homeless children and adolescents.

INTRODUCTION

The global prevalence of homeless families has dramatically increased in recent years. For instance, each night up to 100 000 children are accommodated in temporary facilities in the USA.¹ There has been a perceived ‘democratization of homelessness’: more families, more women and children are affected and, in Western countries, people from ‘visible’ ethnic minorities are disproportionately represented.²

What are the causes of homelessness? *More Than a Roof*,³ the UK government’s report on the problem, which laid the ground for the Homelessness Act 2002,^{4,5} observes that homelessness is attributable to ‘structural’ and personal factors. Structural factors include the reduced supply of affordable housing in many areas; dramatic reductions in the stock of social housing; and, more recently, the growing need to accommodate asylum seekers (in Europe). Personal factors include mortgage and rent arrears; the breakdown of relationships; families or friends withdrawing their support; and the termination of assured short-hold tenancies. However, there are likely to be antecedents to such ‘personal factors’, not least personality difficulties, the onset of mental illness or cognitive impairment, addiction or forensic activity. Some psychiatric studies have suggested that cognitive impairment might impact upon the ability to find shelter (or to relocate to more permanent accommodation)^{6,7} but such findings have emerged *post hoc*.

The UK government’s report readily admits that ‘we know relatively little about the personal, social and economic circumstances of homeless families and other vulnerable people accepted by local authorities for housing’.³ Nevertheless, it points out that those moving into and out of prisons, hospitals and psychiatric facilities, and young people leaving ‘care’, are vulnerable to social exclusion, which can precipitate (and perhaps perpetuate) homelessness. Similarly, in the USA, ‘transient’ families with children and adolescents lose their community support systems, adversely affecting school participation,⁸ their ability to access ‘stress’ related mental health services,⁹ and health care.¹⁰

Recent studies^{6,11,12,13} have indicated that the literature on cognitive function in the young homeless is not extensive. No review of cognitive function and homelessness was found in the Cochrane Library, the NHS National Research Register or the EBM Reviews–ACP Journal Club. Nor was any such study currently registered as being in progress. Preliminary searches for the current review also indicated that the relevant literature might be rather scarce. Recent bibliographies of homelessness research^{14,15} do not refer to any data-sets of cognitive function among those affected, and none is provided by the OPCS survey of psychiatric morbidity.¹⁶

Nevertheless, we sought to address the following questions:

Academic Clinical Psychiatry, University of Sheffield School of Medicine, The Longley Centre, Norwood Grange Drive, Sheffield, England S5 7JT

Correspondence to Dr Randolph W Parks

E-mail: r.parks@sheffield.ac.uk

(1) Do homeless children and adolescents exhibit cognitive impairments?

(2) Are homeless children and adolescents more cognitively impaired than disadvantaged, domiciled children from comparable backgrounds?

METHODS

We followed the same procedures as those indicated in our previous review of cognition in homeless adults.¹³ A systematic review of published sources was undertaken with guidance from recognized standard texts.^{17,18,19} Searches of bibliographic databases were supplemented by identification of relevant references cited in included papers. Other resources included the Cochrane library, NHS National Research Register, EBM Reviews—ACP Journal Club. Finally, a general Internet search was conducted.

As cited in our previous review,¹³ the following electronic resources were searched: PsycINFO, MEDLINE, EMBASE, Social Science Citation Index, Science Citation Index, CINAHL, Biological Abstracts, ASSIA, INSPEC, HMIC/DH Data, British Nursing Index, SPORT Discus, AMED, Econlit, Index to Theses and International Bibliography of the Social Sciences. All searches were conducted back to inception of each journal's electronic databases (e.g. Medline from 1966; all others were later). The search strategy was the same for all databases accessed except for slight changes of syntax where necessary. The following search was performed, searching the title, abstract and any subject heading fields in each database: (homeless* or roofless* or fixed abode* or hostel* or 'bed and breakfast*' or night shelter* or hotel* or housing benefit* or street dwell* or tramp or tramps or vagran* or vagabond*) AND (cognit* or executive function*).

Index to Theses was searched for *homeless** or *roofless** etc and the resulting hits were trawled manually to find relevant dissertations. Almost all the records were found in PsycINFO, Medline, Citation Indexes, EMBASE and CINAHL. All studies published in journals were selected that involved homelessness and cognitive function, irrespective of whether the current research questions were addressed directly. Our two research questions required cognitive test data to be reported. Hence, in the final review we included only those studies where cognitive assessments had been performed among a cohort of children or adolescents in the context of homelessness. Data collected from each source comprised: where the data were obtained (including organizational setting, city, country); methods of cognitive assessment; population characteristics (whether child/adolescent or combinations of these, sex; ethnicity and number of subjects); method of selection of subjects; presence of a control group or other comparison data; and study conclusions.

An initial screening of abstracts (where available) identified those studies potentially relevant to the review. Here, the inclusion criterion was the possibility that some assessment of cognitive function had occurred among a cohort of at least three persons. A more detailed screen of the full-text of these papers produced a subset of studies for inclusion in the final review. At this latter stage, we included only those studies where cognitive testing had actually occurred among the homeless. Since statistical combination of studies should not form a prominent component in a synthesis of observational studies,¹⁷ no attempt was made at meta-analysis of the data found in the included studies. All studies were reviewed by the authors (neuropsychologist, public health researcher, and psychiatrist) and no studies were eliminated from this review if they met the aforementioned criteria.

RESULTS

Initial computer searches produced a crude total of 488 records (taking no account of duplication). However, after 'adult' studies were eliminated, only 10 papers remained that referred to studies of children and adolescents. While a very large number are likely to be homeless across the world,²⁰ the total number for whom cognitive assessments were reported was found to be surprisingly small. Less than 2,000 homeless children and adolescents were clearly described in those papers reviewed (most of them living in shelters in the USA, with one study from South Africa). Therefore, any generalization to homeless children, internationally, is likely to be premature. All the studies reported in detail are cross-sectional in design; there were no prospective studies of cognitive function in homeless children. The variety of age groups incorporated across studies means that few are directly comparable and, while a plethora of different measures of cognitive function has been applied to those children studied, not all the tests applied can be regarded as probing specific cognitive domains (e.g. attention). Hence, various scales are used to assess general levels of intelligence (IQ, below) while other, 'projective', tests are used to infer social cognition²¹ or levels of 'aspiration'.²²

All but one of these studies were conducted in the USA, which, numerically, contributed approximately 98% of those children for whom cognitive measures were readily discernible. Definitions of 'homelessness' varied across studies, incorporating those who were literally 'roofless' (e.g. street children in Johannesburg) and those for whom accommodation was inherently unreliable or temporary (e.g. many of the USA studies). Numerically, most studies concerned shelter residents and the majority of children studied were male (54%, where gender is clearly reported). In American studies of children that report ethnicity, most

reveal a preponderance of those from 'visible' ethnic minorities (especially in the New York,^{22,23,24} Philadelphia²¹ and Baltimore^{25,26} samples). While most studies of homeless adults do not include control groups or comparison data (i.e. from 'non-homeless' samples),¹³ several of the 'child' studies include such a comparator.

Homeless children compared to domiciled children

To be fair, few of the studies identified in our search set out to detect specific cognitive impairments *per se*. However, in those studies incorporating a control group of similarly disadvantaged, but domiciled, children,^{21,23,24,27} there seemed to be evidence that the homeless exhibited relative deficits, the severity of which increased with age. There was a pattern of broadly-defined developmentally staged cognitive problems in the following studies.

In one study of homeless infants and toddlers (just over a year old), conducted in Worcester, Massachusetts and incorporating a control group, no differences were evident in cognitive and motor skills but older homeless children obtained lower scores on most measures of developmental status (for instance, Bayley mental scale).²⁷ In another study, Rescorla *et al.* specifically matched poor families from Philadelphia with homeless families on several demographic variables.²¹ They found receptive vocabulary to be significantly lower in homeless preschool children (ages 3 to 5). Expressive vocabulary performance was also one standard deviation below the domiciled mean and there was a trend for less proficient visuomotor ability.²¹ As part of the same study, an older group of homeless school-aged children (ages 6 to 12) achieved significantly lower vocabulary scores and exhibited a trend toward decreased reading ability, while no differences were evident in visual integration tasks involving manual dexterity. In contrast, New York City studies by Rubin and co-workers²³ and San Agustin and colleagues²⁴ found no differences between homeless and domiciled children on general cognitive measures among similar age groups. Instead, their differences were evident in academic achievement (i.e. significantly lower reading, spelling and arithmetic in the homeless). In these latter studies,^{23,24} deficits in reading were related to school changes and those of spelling to grade (class) repetition but academic performance was unrelated to the number of school days missed or the length of time homeless.

Homeless adolescents

Adolescents were the least studied cohort among the homeless (compared to children and adults). Buckner and associates²⁸ suggested that they are particularly difficult to engage since many unaccompanied adolescents have run away from home or outgrown the foster care system,

ending up on the streets of large cities. Only two studies addressed cognitive factors in homeless adolescents. In one study, 'street children' living in shelters in Johannesburg, South Africa were compared to glue sniffers in the same shelter.²⁹ Both groups displayed visuomotor and problem solving difficulties, poor judgement, weak logical thinking strategies (on standardized measures) and slow performance on timed tasks. No significant differences between glue-sniffing and non-glue-sniffing homeless street children were evident on cognitive tests; however, both groups of homeless scored below 'normal'. Some areas of performance could have reflected a prolonged period of street-living, away from school, but some aspects reflected impaired cognitive functioning. The remaining study (sampling from drop-in centres in Seattle/King County, Washington) was primarily concerned with the late effects of earlier childhood abuse among homeless adolescents.³⁰ Those who reported past physical and sexual abuse evidenced more cognitive problems associated with attention. The same group also exhibited more depression, more severe symptomatology and greater risk of re-victimization (compared with those who were solely either physically or sexually abused). These findings suggest that abuse is associated with persistent cognitive, behavioral and emotional sequelae in homeless adolescents. Both of the adolescent studies clearly indicate that psychosocial impairments and abuse histories are evident among the homeless. These studies did not incorporate the administration of intelligence and academic achievement tests but, as a whole, their homeless adolescents appeared cognitively impaired in comparison to age-related norms obtained from the appropriate test manuals.

Studies of intelligence in the homeless

Studies of homeless children have found receptive vocabulary (as measured by the Peabody Picture Vocabulary Test [PPVT]) to be generally in the 'moderately low' to 'extremely low' range.^{21,31} In one study in Philadelphia, Pennsylvania, preschool homeless children's standard scores were two standard deviations below the expected average.²¹ Stretch and Kreuger³¹ found that 80% of young homeless children in St Louis, Missouri, fell at the 50th percentile or lower (i.e. their sample had 'shifted to the left' in terms of statistical distribution), suggesting '... significant language deprivation...' and '... difficulties in learning situations...' In the same study, the Slosson Intelligence Test – Revised score was in the average range. A sub-analysis of this same test revealed that approximately 11% of children were in the 'mildly retarded' range and 35% were in the 'slow-learner' borderline range. These authors concluded that the 'homeless children tested had three times the cognitive and developmental problems that would be expected among children in general.' Similarly,

Whitman and colleagues³² (p 517) found that ‘. . . homeless children [also in St Louis] had test results in the mentally retarded or borderline range at three times the expected rate. An even greater number demonstrated serious delay in their capacity to produce and use language.’ Unfortunately, none of the studies of homeless adolescents incorporated such intelligence testing.

DISCUSSION

To date, most studies available for review, whether of young children or adolescents, have tended to utilize cross-sectional designs to sample subjects in specific settings (e.g. hostels or clinics). Most studies have taken place in the USA and their demographic features may reflect local conditions. The evidence for cognitive impairment in homeless children is currently derived from relatively few studies, using test instruments mostly designed to measure global intelligence. Though their findings imply a degree of generalized cognitive impairment (i.e. low IQ), the current data are rather sparse. Thus, the evidence for an association between cognitive dysfunction and the state of homelessness is conditional and not necessarily applicable to non-Western settings. Some authors have found developmental retardation,^{27,32} reduced academic performance²³ and ‘aspiration’²² to be linked to duration of homelessness. However, these studies are all retrospective in design.

Given the number of homeless children and adolescents in the world, it is perhaps surprising that so few studies have examined their cognitive function. We posited that homelessness would probably impact upon cognitive development and function, not least through such proximal causes as malnutrition, trauma, alcohol and substance misuse, neurological and psychiatric disorder. However, the database located in our current review is rather small, and has proven informative mostly in respect to the first of our research questions: Do homeless children and adolescents exhibit cognitive impairments?

The answer to the latter would appear to be ‘yes’, but with certain reservations. The data assayed are mostly derived from the USA and, hence, nearly all papers are from the ‘first world’ (the possible exception being the study of street children in Johannesburg).²⁹ Also, our electronic searches were conducted in the English language. This has the potential limitation of biasing towards researchers who in general publish in English. All identified studies are cross-sectional in design, and few have been primarily concerned with detecting cognitive dysfunction. In those that have studied the latter, most have relied upon global measures of function (compared with neuropsychological probes of specific cognitive domains such as attention).

There is some evidence to suggest that homeless children are more cognitively impaired than disadvantaged

domiciled children from comparable backgrounds.^{21,23,24} In these comparison studies, homeless children exhibited intact functions in early childhood (as infants and toddlers),²⁷ which were followed by motor and receptive vocabulary impairments during preschool years.²¹ Subsequently, school-aged homeless children demonstrated deficits primarily in the area of scholastic achievement.^{23,24} The homeless may also exhibit more behavioural and emotional disturbance than the domiciled²¹ and may have more educational difficulties.^{21,23,24} Some studies suggest that duration of homelessness may be related to such difficulties^{23,27,32} and that appropriate schooling may ameliorate educational delay.^{21,24}

Research on homeless adolescents, however, has been even more limited. Those with or without a history of drug abuse scored lower on cognitive measures in comparison to respective test manuals’ normal data (obtained from a domiciled population).²⁹ In those homeless individuals with a history of physical and sexual abuse there was evidence of cognitive impairments in the domain of attention.³⁰ The trauma of abuse may compound the cognitive problems of adolescent youths. Our clinical experience, with late adolescent homeless youth, suggests that a large number have significant mental health concerns, which, if left untreated, might progress to serious psychopathology. For example, in our community-based homeless intervention program (Sheffield Homeless Assessment and Support Team) we have found that those adult homeless who reported physical and/or sexual abuse in childhood were more likely to self-harm.³³

If the findings of our review are borne out in future research, then intervention programs aimed at the homeless are needed to address their cognitive difficulties as well as providing shelter and nutrition. In addition to social work assessments, cognitive evaluation with brief intelligence screening (e.g. PPVT) is recommended. Psychiatric or psychological screening is also advised for the homeless adolescents, if the clinician suspects the possibility of prior physical, sexual, or substance abuse.

Competing interests None declared.

Funding This research was funded by a grant from the Sheffield Care Trust NHS.

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