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Psychopathology among young homeless people: longitudinal mental health outcomes for different subgroups

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Abstract:	Background: Homeless young people are recognised as a very vulnerable group in terms of mental health; however, few studies in the UK have examined this. Furthermore, homeless young people represent a heterogeneous group in terms of their mental health and greater characterisation could improve intervention work. Objectives: The aims of the study were to examine prevalence and subtypes of psychopathology among a British sample of young homeless people; to investigate potential associations between identified typologies and a priori specified current and past experiences. In addition, the study intended to explore physical health, mental health and housing outcomes for the different mental health subgroups. Design: A prospective longitudinal design was used. Methods: Structured interviews including a mental health assessment were conducted with 90 young homeless people aged 16-23 years. Follow-up interviews were conducted ~10 and ~20 months later. Cluster analysis at baseline was used to identify groups based on lifetime mental health problems. Results: The current and lifetime incidence of mental health problems was high (88% and 93%, respectively). Three subgroups of homeless young people were identified: 1. Minimal mental health issues; 2. Mood, substance and conduct disorder; 3. Post-Traumatic Stress Disorder, mood and anxiety issues. These groups differed with respect to follow-up indicators of change and stability of mental health status, service use, and suicide risk, but not housing outcome. Other characteristics (gender ratio, past experiences) also distinguished the subgroups. Conclusions: Typologies of young homeless people based on psychopathology reveal differences in lifetime and future experiences including mental health at follow up. Identified groups could be used to tailor interventions towards differing needs.

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Thank you for submitting your revised manuscript to the British Journal of Clinical Psychology. I can see you have made the suggested amendments however on a final thorough reading of your paper I found some further details that detract from the polished quality of the paper. Could you please attend to the following minor points and submit a revision of your manuscript.

Abstract - second sentence: there's a word missing between...mental health "and" great? - "and" added
p. 7 ...in the past week (full stop missing) The...
- Full stop added
p. 8 reference van den Bree, Shelton. et al - remove the full stop and check the font -Full stop removed and font size changed
p. 9 full stop missing after (Shelter, 2013) in the last paragraph
- Full stop added
p. 10 numbered aims - put : before 1 and ; before 3 and "and" before
4 - These have been added
p. 10 Participants were aged
- Changed
p. 11 Measures - put ; before 3
- Added
p. 20 psychosis and substance dependence (not dependent)
- Changed
p. 21 remove the double line spacing before the paragraph beginning
"Cluster..." - Space removed
p. 22 Housing first models of intervention for people with complex (the word "needs" is missing)
- 'needs' added
Check that all references within the text are ordered alphabetically by first authors' surname.

- Checked

Check that all references in parentheses in the text have a , between the authors name and the date.

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Psychopathology among young homeless people: longitudinal mental health outcomes for different subgroups

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Abstract

Background: Homeless young people are recognised as a very vulnerable group in terms of mental health; however, few studies in the UK have examined this. Furthermore, homeless young people represent a heterogeneous group in terms of their mental health and greater characterisation could improve intervention work. **Objectives:** The aims of the study were to examine prevalence and subtypes of psychopathology among a British sample of young homeless people; to investigate potential associations between identified typologies and *a priori* specified current and past experiences. In addition, the study intended to explore physical health, mental health and housing outcomes for the different mental health subgroups. **Design:** A prospective longitudinal design was used. **Methods:** Structured interviews including a mental health assessment were conducted with 90 young homeless people aged 16-23 years. Follow-up interviews were conducted ~10 and ~20 months later. Cluster analysis at baseline was used to identify groups based on lifetime mental health problems. **Results:** The current and lifetime incidence of mental health problems was high (88% and 93%, respectively). Three subgroups of homeless young people were identified: 1. Minimal mental health issues; 2. Mood, substance and conduct disorder; 3. Post-Traumatic Stress Disorder, mood and anxiety issues. These groups differed with respect to follow-up indicators of change and stability of mental health status, service use, and suicide risk, but not housing outcome. Other characteristics (gender ratio, past experiences) also distinguished the subgroups. **Conclusions:** Typologies of young homeless people based on psychopathology reveal differences in lifetime and future experiences including mental health at follow up. Identified groups could be used to tailor interventions towards differing needs.

Practitioner Points

- Low mood, anxiety, PTSD and psychosis are common mental health issues among young homeless people in the UK.

- Subgroups of young homeless people with differing needs can be identified and these groups can be used to predict outcomes.

- Tailoring support provision towards specific needs has the potential to improve mental health and other outcomes for vulnerable young homeless people.

- Young homeless people often do not access the support to which they are entitled. Services need to be adapted to improve access for this group.

Key Limitations

- Few among the sample had experienced street homelessness.

- The relatively low incidence of some mental health conditions means that predictions of mental health outcomes should be interpreted with caution.

Psychopathology among young homeless people: longitudinal mental health outcomes for different subgroups

Young homeless people represent one of the most vulnerable groups in society. High rates of psychopathology, involvement in drug or alcohol misuse, lack of social support, involvement in criminal activity, lack of education and/or employment and experiences of physical, sexual or emotional maltreatment appear to combine in multiple ways, resulting in difficulties in obtaining and maintaining stable housing (Hammersley & Pearl, 1996; Marpsat, Firdion & Meron, 2000; Philippot, Lecocq, Sempoloux, Nachtergael & Galand, 2007; Hodgson, Shelton, van den Bree & Los, 2013). The heterogeneity of this group with respect to their past experiences and reasons for becoming homeless, as well as the issues faced whilst homeless and moving on from homelessness, hampers intervention efforts (Savelsberg & Martin-Giles, 2008). For example, a number of studies have identified risk factors that relate to homelessness for some subgroups but not others.

Research examining prevalence of psychopathology has found almost universally high levels of mental health issues among young homeless samples, with reported rates ranging from 48% (Kamienieki, 2001) to as high as 98% (Mersham, Van Leewen & McGuire, 2009). This compares to research conducted by the National Centre for Social Research, (2007) that found a prevalence of 32.3% for any psychiatric disorder in a UK community sample of housed young people aged 16-24 years old in the past week. The most commonly identified mental health problems among young homeless people are conduct disorder, post-traumatic stress disorder (PTSD), depression, alcohol and drug misuse and suicidal thoughts and behaviours (Hodgson *et al.,* 2013). Other disorders including psychosis, attention deficit hyperactivity disorder (ADHD), mania and hypomania are also more prevalent among this population (Taylor, Stuttaford, Broad & Vostanis, 2006; Mersham *et al.,* 2009) compared to studies examining stably housed young people (e.g. Kessler,

Berglund, Demler, Jin, Merikangas & Walters, 2005; National Centre for Social Research, 2008). Much of this research has been conducted in the United States and only a couple of studies have examined prevalence of mental health issues among UK samples (Craig & Hodson, 2000; Taylor *et al.,* 2006). Poor mental health can impact on an individual's problem-solving skills, negatively affecting the ability to move out of homelessness (Barrett, Green, Morris, Giles & Croft, 1996; Muir-Cochrane, Fereday, Jureidini, Drummond & Darbyshire, 2006).

Late adolescence and young adulthood is the peak age of onset for many mental health difficulties among the general population (Burke, Burke, Reiger & Rae, 1990). Young homeless people represent a group who have amplified risk due to both their age and the stress, risk behaviours and associated trauma that often accompany becoming/being homeless (Mersham *et al.,* 2009). van den Bree, Shelton, Bonner, Moss, Thomas and Taylor (2009) studying risk of homelessness in a large population-based sample identified experiences of victimisation as an important predictor of homelessness six years later. A retrospective study of young homeless people with a small sample (n=35) by Martijn and Sharpe (2006) identified five pathways into homelessness, two of which were related to trauma. In the present study, cluster three was characterised by PTSD whilst the other groups had very low rates of this condition, despite including members with past maltreatment experiences.

Some research outside of the UK has begun to identify different subgroups within the youth homeless population (Bucher, 2008; Adlaf & Zdanowicz, 1999; Tsai, Edens & Rosenheck, 2011; Shelton, Mackie, van den Bree, Taylor & Evans, 2012). For some young homeless people, behavioural difficulties such as criminal activity, early exit from education and illicit drug use are key factors in homelessness (Shelton *et al*., 2012), while for others experiences of trauma/maltreatment and the absence of social support are crucial to the development and maintenance of homelessness and concurrent mental illness (Fowler, Toro

& Miles, 2006; Kidd, 2006; Martijn & Sharpe, 2006; van den Bree, Shelton, Bonner, Moss, Thomas & Taylor, 2009). These typologies indicate that young homeless people are a heterogeneous group with respect to their reasons for becoming homeless, experiences whilst homeless and their support needs during and following a period of homelessness. However, to our knowledge, no study has examined whether subgroups of young homeless people can be distinguished based on their profile of mental health. This is a major oversight as the presence of mental health difficulties is likely to affect the efficacy of interventions (Buckner 1993).

There is a growing body of evidence that suggests that social isolation impacts upon health and wellbeing. Social identification with a group can be protective for a number of mental health issues (Cruwys, Dingle, Hornsey, Jetten, Oei & Walter, 2014). Homelessness is a form of social exclusion that is likely to lead to the development of social isolation schema which could increase risk for mental health problems (Cruwys e*t al.,* 2014). Perceived control over one's decisions in life has also strongly been linked to mental health (Pearlin, Lieberman, Menaghan & Mullen, 1981). Homelessness represents a situation where by much of people's control over their lives is removed (Greenwood, Schaefer-McDaniel, Winkel & Tsemberis, 2005). The present study examined the relationship between mental health profiles and loneliness and mastery.

For the purposes of this study an experience of homelessness is defined as an incident of living on the street, living in temporary accommodation such as a hostel, shelter or bed and breakfast. Living temporarily with friends or 'sofa surfing' is also included. This is consistent with culturally agreed definitions of homelessness (Shelter, 2013). It is notoriously difficult to follow young homeless people over time, due to the transient and often chaotic nature of their lives. However, a longitudinal design is crucial for the validation of any typology, allowing establishment of the longer-term links between group membership and crucial

factors impacting on risk to remain homeless at follow-up. We are aware of only one small qualitative retrospective longitudinal study of young homeless people (n = 35) (Martijn & Sharpe, 2006).

The aims of the current study were to: 1. identify the prevalence of different mental health problems among a British sample of young homeless people; 2. identify subgroups of young homeless people based on patterns of mental health experienced across their lifetime established using research diagnostic criteria; 3. further characterise these subgroups in terms of *a priori* specified current and past experiences associated with increased risk of homelessness and 4. examine any longitudinal group differences in psychological functioning (future mental health, loneliness, mastery), health-related factors (suicide risk, service use), and housing at follow up.

Method

Sample: The data derive from a three wave longitudinal study examining the experiences and individual characteristics of young homeless people living in the country of Wales, UK. Data were available for 116 young people at initial interview. At two follow up periods (mean gap time 1 to 2 10 months, range 8-12 months; and time 2 to 3 20 months, range 18-24 months), 74% of the sample were re-interviewed (n = 90) forming the sample for this study. Participant aged were 16-23 years old (mean = 17.74 years; *SD* = 1.54). Thirty nine (43.1%) participants were male. At initial interview all participants were residing in temporary supported accommodation with the youth homelessness charity Llamau in cities and rural towns in South Wales. The sample was recruited via support workers and great effort was made to gain a sample representative of the young homeless population living in Wales. This was achieved by consulting staff and advertising across housing projects. The majority of the young people who took part in the study had been homeless for at least one

month (81.1%, n = 73). The remaining (n = 17) had been homeless for at least one week. The most commonly self-reported reason for becoming homeless was family relationship breakdown. This is consistent with findings of other studies examining UK youth homeless populations (Bines, 1994).

Every effort was made to trace the participants at follow up. This included visiting new addresses, prisons, contacting other service providers and maintaining contact with participants via phone, text and post. Several factors accounted for sample attrition. Ten participants refused to take part a second time. Refusals were due to lack of time to take part (n=4) and lack of interest in taking part (n = 6). We were unable to organise interviews for seven participants despite a minimum of four attempts. Nine participants had moved away and not passed on new contact details.

Procedure: Structured interviews were carried out by trained researchers and lasted approximately two hours. Participants were fully informed of the nature of the study and were able to withdraw at any time. All questions were read to the participants to avoid issues linked to poor literacy levels. If participants became distressed the researchers suggested a break and ensured that the participant still wanted to continue. A gift voucher was given in return for participation. The procedure remained the same at each follow up.

Measures: The interviews included a number of measures including questions exploring biographical information and information on key past experiences: 1. age at interview; 2. age left school; 3. the presence (1 = Yes) or absence (0 = No) of any of the following was recorded: any experience of physical, sexual or emotional maltreatment or neglect; 4. any use of physical health services in the past 6 months; 5. currently receiving mental health services; 6. ever suspended or expelled from school; 7. ever run away from

home; 8. ever spent time in state care; 9. any family history of mental health problems including alcohol or drug misuse and 10. ever committed a crime.

Mental health: was assessed at initial interview and follow up using the MINI PLUS Neuropsychiatric Interview 5.0 (Sheehan & Lecrubier, 2006) an internationally recognised and validated diagnostic assessment (van Vliet & de Beurs, 2007) of DSM-1V (American Psychiatric Association, 2000) and ICD-10 (World Health Organisation, 1992) diagnoses. Suicide risk was also assessed using a points-based system contained in this measure. The risk of suicide measure consisted of 11 items including items on history of past suicide attempts, suicide planning, suicidal ideation and intent. Interviewers were PhD students and research assistants formally trained in conducting this assessment. All interviews were recorded and monthly supervision with a Psychiatrist was also provided to ensure the accuracy of research diagnoses. Post-Traumatic Stress Disorder was measured using the Impact of Events Scale Revised (IES-R) (Weiss & Marmar, 1997). The measures had high levels of internal consistency ($\alpha=.82$ at initial interview and .90 at time 3 follow up). Test-retest reliability, collected across a 6-month interval, ranged from α time 1=.89 to time 3 = .94 indicating stability of symptoms measured where no new traumatic events occurred (Weiss & Marmar, 1997). Conduct disorder was assessed using the Personality Diagnostic Questionnaire (PDQ-4) (Hyler, 1994). Good internal consistency was identified ($\alpha=.90$ at initial interview and .91 at follow up, time 3). The identification of psychiatric disorder was validated by consultation with a Psychiatrist. Comorbidity was calculated by summing the total number of baseline mental health issues identified.

Stability and change in mental health status: Change and stability of the different psychiatric disorders was assessed from initial interview to second follow up to allow the maximum amount of time for change. Participants were categorised according to whether

they had remained stable without the disorder, developed the disorder between initial interview and final follow up, recovered from the disorder between initial interview and final follow up or remained stable with the disorder across course of the study.

Psychological functioning at follow-up: In addition, a number of psychological functioning variables were assessed at second follow up. Loneliness was assessed using the UCLA Loneliness Scale (Russell, 1996; α =.89); the Mastery Scale (Pearlin *et al.,*, 1981; α time 3 =.76) was used to assesses a participant's sense of control over events in their lives; finally the Self-Control Scale (Tangeny, Baumeister & Boone, 2004; α =.77) was also used.

Housing at follow-up: This information was provided by service users and confirmed by records. Housing instability was measured by occurrence of any of the following events since the last interview: eviction, abandonment of tenancy, moving house more than once or being made homeless again. Housing outcome was also measured by whether the participant had spent time in their own privately rented or local authority owned property.

Statistical analysis: The data were analysed using cluster analysis, chi-square, ANOVA and MANOVA techniques. Cluster analysis draws boundaries in a data set by considering the similarity of the observations across a predetermined set of variables, in this study lifetime experience of mental health problems (Clatworthy, Buick, Hankins, Weinman & Horne, 2005). The method allows the identification of mutually exclusive groups. Members of the derived groups are as similar as possible to other members of the group and as different as possible to members of other groups. A two-step cluster analysis was selected, because it can analyse categorical variables. This method also enables development of clusters without the bias that can be introduced by creating categories or ordering variables. In order to achieve accurate and useful clusters the disorders examined via the interview were initially grouped according to the DSM-IV (APA 2000) diagnostic categories: mood,

psychotic and substance dependence disorders. Anxiety disorders were grouped exclusively of post-traumatic stress disorder (PTSD) (grouped by the DSM –IV with Anxiety disorders, APA 2000). PTSD was examined separately due to the key role of trauma in its development, which is a particularly common experience within this population. Past conduct disorder was also included as a separate variable. Adult ADHD and eating disorders were excluded due to their very low prevalence in the sample (n = 3, n = 5 respectively).

The clustering criterion was Schwartz's Bayesian Criterion and the distance measure was Log-Likelihood (Clatworthy *et al.,* 2005; Everitt, Landau & Leese, 2009). The derived clusters were then used to assess whether group membership was associated with a number of past experiences, baseline comorbidity, housing, suicide risk and the participant's use of health and mental health services at short term follow up ~10 months later (time 2) as well as with mental health and psychological functioning outcomes at ~20 months (time 3).

Results

The results of the mental health assessment are shown in Table 1. Seventy -nine (87.8%) of participants met criteria for one or more current mental health problem and 84 (93.3%) for one or more lifetime mental health problem. Rates of current issues varied from PTSD (35.5%) to adulthood ADHD (3.3%). Table 1 contains comparative data for 16-24 year olds from the National UK Adult Psychiatric Morbidity Survey (National Centre for Social Research, 2007). Comparison between the two samples reveals considerably higher rates of almost all mental health problems among young homeless people.

Insert Table 1 here

Cluster Analysis: The analysis revealed three distinct groups based on lifetime mental health disorders (see Table 2). Young homeless people in cluster 1 had 'Minimal mental

health issues' in comparison to the other clusters (particularly no psychosis, 0% or PTSD, 5%). Cluster 2 'Mood, substance and conduct disorders' included high numbers of young people who had experienced substance dependence (83%), mood disorder (91%) and conduct disorder (83%) as well as all other mental health problems including psychosis (65%), with the exception of PTSD (0%). Cluster 3 'PTSD, mood and anxiety issues' was characterised by high rates of all mental health problems, particularly PTSD (100%) mood disorders (100%) and anxiety disorders (73%).

Insert Table 2 here

In Table 3, the cluster groups are compared on a number of dimensions that have been associated with increased risk of homelessness among young people, including gender, early exit from education, criminality and maltreatment (Quilgars, Johnsen & Pleace, 2008; Shelton *et al.,* 2011; van den Bree *et al.,* 2009). The results of the analysis of psychological functioning, service use and housing at follow up are also included.

Insert Table 3 here

1) Minimal mental health issues: This group had approximately the same number of males (46%) and females (54%). Levels of childhood experiences of maltreatment were lower compared to the two other groups (emotional abuse 49%, neglect 38%, sexual abuse 5%). At follow-up this group had lower levels of loneliness and higher levels of mastery. Although the number of comorbid conditions at baseline was lower, the majority of this subgroup still met criteria for at least two conditions (51.4%). Similarly, although lower compared to the other two clusters, baseline (30%) as well as follow-up (41%) rates of suicide risk were high.

2) Mood Substance and conduct disorder: This group had more males (n = 14, 61%), and a greater number reported first becoming homeless before their 16th birthday (39%, compared to ~13% in the two other groups). The highest level of school suspension or expulsion (83%) was observed in this group.

At follow up, this group were most likely to have accessed drug and alcohol services (26%, compared to 5% in cluster 1 and 3% in cluster 3). However, given the high level of substance use problems (69.6% for drug abuse and 56.5% for alcohol abuse) level of access to this type of service was still relatively low. Members of this group had an average of three comorbid psychiatric disorders and over half (52%) were at risk of suicide at baseline, a figure which had increased to 65% 10 months later. At follow-up this subgroup reported a high rate of general practitioner visits (74%).

3) PTSD, mood and anxiety issues: All members of this cluster had PTSD as well as a lifetime mood disorder, while the rate of anxiety disorder was also high. This group were mainly female (73%). Experiences of past maltreatment were common; emotional, physical ,sexual maltreatment and neglect were prevalent (87%, 63%, 23% and 80% respectively). Members of this group were also most likely to have multiple comorbid conditions at baseline. This group was at particularly high risk of suicide (77% at baseline and 67% at follow-up). MANOVA analysis revealed high levels of loneliness and low self-mastery at ~20 month follow-up were associated with membership of cluster three.

No associations were found between cluster membership and either housing instability since initial interview or living in private property at follow up (Table 3). Table 5 provides an overall summary of the distinguishing characteristics by cluster relative to other clusters. There were no differences in those receiving mental health care despite the variation in levels of mental health between the groups.

Table 4 presents the results of the analysis of cluster membership and change/stability in mental health status over time. Participants fell into one of four categories for each mental health issue with regard to their mental health status over the course of the study: stable no disorder, improved, developed disorder or stable disorder. The analysis of the relationship between these change groups and cluster membership revealed that at follow up ~20 months later cluster one were most likely to remain stable without disorder across all the disorder categories. However, 13% this group went on to develop a mood disorder over the course of the study (n = 7). Cluster two members were more likely to still have a substance dependence disorder ~20 months later and were most likely of the clusters to develop PTSD. A large number of participants had experienced mood disorders in their lifetime although these individuals were not more likely to have re-experienced the disorder across the study period. In addition, several individuals (n = 10) had improved anxiety issues during the study period. Finally, cluster three members were most likely to have experienced persistent mental health problems that lasted across the course of the study. They were most likely to have persistent PTSD, mood disorders and anxiety. In addition, they were most likely to develop psychosis and substance dependence by the final follow up. Table 5 clearly displays all the defining characteristics of each cluster group in comparison to the other clusters.

Insert table 4 here

Insert table 5 here

Discussion

This is the first study to identify groups of homeless young people based on lifetime incidence of mental health difficulties and to validate the groups by assessing their relationship with psychological functioning and service use at follow up. Furthermore, it is one of only three studies to measure the prevalence of mental health problems among young

homeless people in the UK. Three groups of young homeless people were identified and further differentiated by their associations with past experiences such as childhood maltreatment. Longitudinal studies of homeless people are rare. Availability of follow-up data obtained ~10 and again ~20 months after the initial assessment of mental health problems allowed us to examine these clusters in relation to factors associated with risk of continued homelessness and to evaluate evidence of varying levels and types of need between the groups.

The current and lifetime incidence of mental health problems was high (87.8% and 93.3%). The rates of mental health issues we found far exceed those among young people in the general population.. The occurrence of specific disorders was also markedly higher than has been observed among the general population for all disorders except ADHD and eating disorders (Kessler *et al*., 2005; National Centre for Social Research, 2007). The results of this study are consistent with previous research exploring the prevalence of mental health problems among homeless youth (Hodgson *et al*., 2013) but underscore the high level of need in the UK.

The three cluster groups identified were: 1) *Minimal mental health issues:* This group was characterised by lower levels of mental health issues than the other two clusters. However, levels of certain conditions were still elevated in comparison to the general population (National Centre for Social Research, 2007, Kessler *et al.,* 2005). At follow-up this group had higher levels of mastery and lower levels of loneliness, suggesting they were faring better than the two other clusters. Similarly, members of this group were least likely to have a persistent mental health condition over the course of the study. However, although the number of comorbid conditions at baseline was lower, the majority of this subgroup still had a comorbid disorder. Similarly, although lower compared to the other two clusters, rates of

suicide risk were high. These findings indicate this group are functioning better than the two other groups but still require careful monitoring based on their profile of mental health needs.

2) Mood, substance and conduct disorder: This predominantly male group were characterised by difficulties related to behaviour (school expulsion/suspension and history of conduct disorder) indicating a need for education and training. However, despite the high rate of conduct disorder for this group, the reported rate of crime was comparable to cluster 3, suggesting perhaps the measure of crime was not sensitive enough.

Very few members of cluster 2 were accessing the alcohol and drug or mental health support they required at follow up. The analysis of future mental health status revealed members of this group were likely to have a persistent substance dependence disorder and were most likely of the three clusters to develop PTSD. This indicates that this group remained vulnerable at follow-up, which is possibly linked to their substance use. However, this group were not likely to re-develop mood disorder and several appeared to have recovered from anxiety issues. This group had the highest levels of psychosis at baseline this could be seen as consistent with the fact that young men typically develop psychosis earlier than women (Burke *et al.,* 1990). However, the high rates observed here have major implications for intervention work. Recognition of early symptoms of psychosis has strong implications for management of the condition including appropriate treatment, psychosocial intervention and adequate housing (Jackson & McGorry, 2009).

3) PTSD, mood and anxiety issues: This mainly female group had most commonly experienced past maltreatment, the rates of which were very high compared to the general population (NSPCC, 2011). This group were also very socially isolated. Loneliness has strong negative implications for mental health (Rew, 2002) and this is supported by our finding of high levels of suicide risk and multiple comorbidity in this group. This group also

had a low perception of the control over their lives (Pearlin et al., 1981). The low levels of mastery seen here indicate this group may not perceive they are able to change their circumstances. Furthermore, the members of this group were shown to be most likely to have experienced persistent disorders or to have developed further mental health problems across the course of the study. Identifying persons who may fall into this highly vulnerable category is important for service providers. Perhaps most seriously, psychosis and substance dependence were developed by a number of the members of this cluster. This is in line with women developing psychosis later than men (Burke *et al.,* 1990). The implications for treatment of cluster 3 and 2 include coordination of multiple agencies in order to provide a holistic package of care that has been shown to be most effective (Jackson & McGorry, 2009)

Some previous research has also tried to categorise young homeless people according to their needs, difficulties and past experiences (Adlaf & Zdanowicz, 1999; Tsai *et al.,* 2001; Martijn & Sharpe, 2006; Bucher, 2008; Shelton *et al.,* 2012). However, these studies were cross-sectional in nature and typologies were not based on mental health diagnoses. Shelton *et al.,* (2011) identified a 'young offenders' group who were more likely to have been expelled from school, be involved in crime and have problems with addiction. Bucher (2008) similarly identified a subgroup of young people whose main support need was behaviour management and drug use. These groups share some common features with cluster two 'Mood, substance and conduct disorder'. However, Bucher and Shelton did not use well validated and comprehensive mental health measures. In contrast to these studies, the clusters identified in the present study differed in their experiences of trauma and PTSD. One group (cluster 3) appeared to be particularly marked by their experiences of trauma. The notion that cluster 3 was particularly vulnerable is further supported by the negative mental health outcomes associated with this group. Taken alongside findings that trauma is an important predictor of homelessness (Van den Bree *et al.,* 2009) and plays a key role in homeless

trajectories (Martijn and Sharpe, 2006) these findings highlight that trauma appears a key characteristic for a proportion of young people with experiences of homelessness with potentially important links to their profile of mental health. Background as a 'looked after child' is a common experience of young people who become homeless. The early adversity and unstable placements that this situation is characterised by is known to contribute to development of mental health issues linked to trauma (Blower, Addo, Hodgson, Lamington & Towson, 2004). Furthermore, a number of the sample reported having experienced extreme examples of early adversity but had not been taken into state care. This situation led to prolonged exposure to abuse, neglect and an unstable home environment throughout development.

Cluster membership was evaluated with regards to housing stability at follow-up. Previous research exploring subgroups of young homeless people has not examined links to housing status. No associations were found between cluster membership and housing outcomes. This is likely due to the impact of external structural factors. Young people are given priority status for housing by local authorities in England and Wales. They are therefore more likely to be in temporary accommodation or local authority housing irrespective of their mental health or behavioural difficulties. Charities and local authorities provide support to young people to help them to find and maintain accommodation which removes the effects of many individual factors on housing status (Mackie, Thomas & Hodgson, 2012). Overall, therefore, because the bar set by charities and support organisations for asking a young person to leave supported accommodation may be high, the relationship between psychopathology and short term assessments of housing stability may be attenuated.

Limitations

The young people were all initially interviewed while living in temporary accommodation. While all had been homeless, very few (n = 3) had ever spent time on the streets. This limits our ability to compare the findings with those derived from samples of homeless youth which have included large numbers of street homeless. Despite this difference, the rates of mental illness are very similar to studies including young people who have spent time on the streets (Hodgson *et al*., 2013).

We noted that suicide risk rose in the minimal mental health issues group and the mood, substance and conduct disorder group but not the PTSD, mood and anxiety group during the study period. This may be because rates of suicide risk were already high in group three and were unlikely to rise further. Furthermore, group three had the highest level of access to mental health care (although not significantly) and this may have had some effect on suicidality.

A final limitation relates to the analysis of change in mental health status. Some of the change/stability groups contained very small numbers of participants. It is therefore important to treat some of the findings with care, particularly those for psychosis where there were very few participants who met criteria for disorder.

Implications

Most interventions currently available to young homeless people focus primarily on the immediate housing crisis by providing temporary accommodation. Later intervention work is often focused around finding and maintaining stable accommodation. Mental health support is not often at the centre of intervention efforts, even though psychopathology may hamper the ability of young people to successfully maintain tenancy agreements and lead independent lives. Housing first models of intervention for people with complex needs suggests that housing is a key element of recovery from mental illness (Johnson & Teixeira,

2010). However, little research has examined the efficacy of this model for young homeless people. Young people may not have the necessary skills for independent living and a stepped approach to resettlement may be considered more appropriate (Johnson & Teixeira, 2010).

The high prevalence of mental health difficulties we found indicates providing appropriate support that includes mental health intervention is essential. The cluster analysis revealed three groups with different support needs. Identifying groups such as these could help service providers target resources more effectively. Screening for mental health problems early on in support provision could highlight the types of support required.

Providers need to be mindful of the fact that despite the obvious need for mental health services, young homeless people rarely access the support that they require (Reilly, Herrman, Clarke, Neil & McNamara, 1994; Bines, 1994). In this sample, very few of those young people with a baseline mental health condition were receiving any form of mental health care. Mental health screening programmes for youth in shelters and other temporary accommodation, followed by assertive outreach programmes providing targeted services, tailored to address potential comorbid psychopathology, may go some way to addressing this issue. Services need to be adapted to fit the multiple needs and the chaotic nature of this underserved group. In particular, the high levels of trauma observed in cluster 3 must be taken into account when treatment planning. Trauma informed care practises should be implemented when working with this very vulnerable group (Hopper, Bassuk & Olivet, 2010). The findings of the cluster analysis also revealed that some young people appear to be managing their mental health relatively well and may require less intensive support (e.g., signposting to services). Screening young people in the first stages of intervention work may reduce inefficiency resulting from providing unsuitable or unnecessary support. The research has informed practise at the youth homelessness charity 'Llamau' where it was conducted.

Mental health screening has been made a priority and is used to inform the type of support provided to individual service users.

This study revealed a picture of poor mental health among young homeless people. A typology of young homeless people, which has predictive value over one and half years later was identified and could be used to screen and target specific support needs. Tailoring support provision has the potential to improve mental health and other outcomes for this vulnerable group.

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Table 1: Prevalence of current and lifetime mental health problems in the young homeless sample under study (n=81) and prevalence among the general population from the UK Adult Psychiatric Morbidity Survey 2007 (n=560) (National Centre for Social Research, 2007).

Psychiatric Disorder	Current disorder at initial interview		Lifetime incidence of disorder		Prevalence among general population †
	n	**%**	**n**	**%**	**%**
Any diagnosis	79	87.8	84	93.3	32.3%
Suicide risk	46	51.1	NA	NA	7(Suicidal thoughts past year)
					1.7 (Suicide attempts)
PTSD	32	35.6	NA	NA	4.7%
Alcohol dependence	26	28.9	29	32.2	11.2 (Past 6 months)
Drug dependence	26	28.9	31	38.3	10.2 (Past year)
GAD	17	18.9	NA	NA	3.6
Alcohol abuse	21	23.3	22	24.4	6.8 (Past year)
Personality disorder	17	18.9	NA	NA	NA
Major depression	16	17.8.	39	43.3	2.2
Specific phobia	16	17.8	NA	NA	1.5
Social phobia	14	15.6	NA	NA	NA
Agoraphobia	13	14.4	16	17.8	NA
OCD	8	8.9	NA	NA	2.3
Panic disorder	8	8.9	13	14.4	1.1
Drug abuse	8	8.9	6	7.4	NA

Psychiatric Disorder	Current disorder at initial interview		Lifetime incidence of disorder		Prevalence among general population
	n	%	n	%	%
Mania	3	3.3	13	14.4	NA
Bulimia	5	5.6	NA	NA	13.1 (Any eating disorder BMI not accounted for)
Bipolar disorder	2	2.2	5	5.6	NA
Adult ADHD	3	3.3	NA	NA	13.7 (Diagnosis did not require childhood ADHD)
Hypomania	0	0	34	37.8	NA
Dysthymia	0	0	2	2.2	NA
Anorexia	0	0	NA	NA	13.1 (Any eating disorder BMI not accounted for)
Comorbidity	66	73.3	NA	NA	12.4

Note: NA – Not applicable, disorder only assessed for current prevalence or not assessed. PTSD = Post traumatic stress disorder, GAD = Generalised anxiety disorder, OCD = Obsessive compulsive disorder, ADHD = Attention deficit hyperactivity disorder.

†Prevalence among the general population taken from the Adult Psychiatric Morbidity Survey, (2007). Prevalence of psychiatric disorder in past week among housed 16-24 year olds UK.

Table 2: Results of cluster analysis of lifetime mental health issues.

	1. Minimal mental health issues	2. Mood, substance and conduct disorder	3. PTSD, mood and anxiety issues
	n=37	n=23	n=30
Diagnostic Category			
1.PTSD	5.4%	0%	100%
2.Conduct disorder	37.8%	82.6%	56.7%
3.Mood disorder	24.3%	91.3%	100%
4.Anxiety disorders	29.7%	65.2%	73.3%
5.Psychosis	0%	65.2%	36.7%
6.Substance dependence	32.4%	82.6%	36.7%

Table 3: Frequencies and chi-square values for study variables with clusters.

	Cluster 1 Minimal mental health issues (n=37)	Cluster 2 Mood, substance and conduct disorder (n=23)	Cluster 3 PTSD, mood and anxiety issues (n= 30)	Chi-Squared Associations
Time 1 variables	n (%)	n (%)	n (%)	χ^2
1.Gender (proportion female)	20(54.1)	9 (39.1)	22 (73.3)	6.38*
2.Ever run away	18(48.6)	11 (47.8)	20 (66.7)	2.71
3.Ever suspended or expelled	20(54.1)	19 (82.6)	13 (43.3)	8.59*
4.Ever been in care (foster or residential)	13(35.1)	5 (21.7)	8 (26.7)	2.85
5.Age first homeless:				10.05*
Under 16	5 (13.5)	9 (39.1)	4 (13.3)	
16-18	26(70.3)	13 (56.5)	18 (60.0)	
Over 18	6 (16.2)	1 (4.3)	8 (26.6)	
6.Maltreatment:				
Emotional	18(48.6)	10 (43.5)	26 (86.7)	15.30**
Neglect	14(37.8)	11 (47.8)	24 (80.0)	11.59**
Physical	15(40.5)	12 (52.2)	19 (63.3)	4.06
Sexual	2(5.4)	2 (8.7)	7 (23.3)	5.66*
Witness of abuse	19(51.4)	13 (56.5)	19 (63.3)	.97
Abuse from partner	6 (16.2)	6 (26.1)	8 (26.7)	1.31
7.Family History of:				
Psychological problems	19(51.4)	14 (60.9)	22 (59.5)	3.37
Drug abuse	27(73.0)	12 (52.2)	20 (87.0)	2.74
Alcohol abuse	19(51.4)	17 (73.9)	20 (66.7)	3.45
8.Ever committed a crime	10(27.0)	12 (52.2)	15 (50.0)	5.17
9. Baseline suicide risk	11(29.7)	12 (52.2)	23 (76.7)	16.83**
Continuous variables	(SD)	(SD)	(SD)	f
1.Number of baseline comorbid conditions	1.78 (1.78)	3.04 (1.87)	5.23 (2.84)	20.34**

	Cluster 1 Minimal mental health issues (n=37)	Cluster 2 Mood, substance and conduct disorder (n=23)	Cluster 3 PTSD, mood and anxiety issues (n= 30)	Chi-Squared Associations
Follow up variables	n (%)	n (%)	n (%)	χ^2
1.Emergency department use	6 (16.21)	5 (21.7)	11 (36.6)	3.87
2.Hospital service use	12(32.4)	9 (39.1)	17 (36.7)	4.11
3.Mental health service use (including medication)	9 (24.3)	8 (34.7)	11 (36.7)	1.37
4.General practitioner use	15(40.5)	17 (73.9)	22 (73.3)	9.92**
5.Drug and alcohol service use	2(5.4)	6 (26.1)	1 (3.3)	8.96*
6.Suicide risk at follow up	15(40.5)	15 (65.2)	20 (66.7)	5.75*
7.Housing instability since initial interview	5 (13.5)	6 (26.1)	8 (26.7)	1.09
8.Time in own accommodation since initial interview	20(54.1)	12 (52.2)	17 (56.6)	.110
Continuous variables at follow up	(*SD*)	(*SD*)	(*SD*)	*f*
1.Loneliness	38.43 (*8.30*)	38.80 (*9.05*)	44.33 (*10.16*)	3.95*
2.Mastery	26.41 (*4.26*)	24.96 (*3.70*)	23.50 (*4.45*)	3.75*
3.Self-control	37.44 (*6.06*)	36.58 (*8.76*)	38.13 (*7.97*)	1.36

*Critical value for Chi-squared or f exceeded 0.05, ** Chi-squared or f value exceeded 0.001*

Table 4: Change/stability of mental health by cluster group

Disorder	Disorder stability	Cluster group n(%)			X^2
		Minimal mental health issues	Mood, substance and conduct disorder	PTSD, mood and anxiety issues	
Mood disorder	Stable no disorder	30(81.1)	19(82.6)	15(50.0)	27.69**
	Recovered	0(0)	1(4.4)	3(10.0)	
	Developed disorder	7(18.9)	1(4.4)	1(3.3)	
	Stable disorder	0(0)	2(8.7)	11(36.7)	
Anxiety disorder	Stable no disorder	24(64.9)	8(34.8)	8(26.7)	18.56**
	Recovered	4(10.8)	10(43.5)	7(23.3)	
	Developed disorder	2(5.4)	2(8.7)	2(6.7)	
	Stable disorder	7(18.9)	3(13.1)	13(43.3)	
Psychosis	Stable no disorder	37(100)	18(78.3)	20(66.7)	17.51**
	Recovered	0(0)	1(4.3)	4(13.3)	
	Developed disorder	0(0)	3(13.1)	6(20.0)	
	Stable disorder	0(0)	1(4.4)	0(0)	
Substance dependence	Stable no disorder	23(62.1)	4(17.4)	15(50)	16.56*
	Recovered	4(10.8)	6(26.1)	6(20)	
	Developed disorder	3(8.1)	2(8.7)	5(16.7)	
	Stable disorder	7(18.9)	11(47.8)	4(13.3)	
PTSD	Stable no disorder	30(81.1)	15(65.2)	0(0)	78.38**
	Recovered	2(5.4)	1(4.4)	13(43.3)	
	Developed disorder	5(13.5)	7(30.4)	0(0)	
	Stable disorder	0(0)	0(0)	17(56.7)	

*Note: * significant at <0.05 level; ** significant at the <0.01.*

Table 5: Summary of distinguishing characteristics by cluster relative to other clusters

Cluster 1: Minimal mental health issues	Cluster 2: Mood, substance and conduct disorder	Cluster 3: PTSD, mood and anxiety issues
54% Female	61% Male	73% Female
Less childhood adversity	*Childhood adversity characterised by early exit from education, early homelessness and involvement in criminality.*	*High levels of childhood adversity*
• More likely to first experience homeless between age 16 and 18, 70%.		• Emotional abuse, 87%
• 54% suspended or expelled from school	• 83% suspended or expelled from school	• Neglect, 80%
• Lower levels of childhood maltreatment	• More likely to have first experienced homelessness before age 16, 39%.	• Physical abuse, 63%
• Physical abuse, 41%	• Lower levels of emotional abuse, 44%.	• Sexual abuse, 23%
• Sexual abuse, 5.4%	• Physical abuse, 52%	• Abuse from partner, 27%
• Neglect, 38%	• Higher levels of crime, 52%	*First homeless at older age*
• Lower levels of crime, 27%	*Family history*	• 27% over 18
Family History	• Higher levels of familial psychological problems, 61%	Less likely to have been suspended or expelled
• Lower levels of familial mental health, 51%	*Higher levels of suicide risk*	• 43%
Lower rate of suicide risk	• Time 1, 52%	*Family history*
• Suicide risk at Time 1, 30% and follow up, 41%.	• Follow up, 65%	• Familial Drug abuse, 87%
Low levels of psychiatric comorbidity	Moderate levels of psychiatric comorbidity	*Highest suicide risk*
• Mean number of disorders = 1.8	• Mean number of disorders= 3.0	• 77% Time 1
Lower health service use at follow up	*High service use at follow up*	• 67% follow up
• Lower levels of GP service use at follow up, 41%	• GP service use, 74%	High levels of psychiatric comorbidity
• Lower levels of drug and alcohol service use at follow up, 5.4%	• Drug and alcohol service use , 26%	• Mean number of disorders = 5.2
Better psychological functioning at follow up	*Changing mental health from initial interview to follow up.*	*High service use at follow up*
• Lowest levels of loneliness	• Most likely to recover from Anxiety disorders.	• Emergency department, 37%
• Greatest levels of self-mastery	• Most likely to develop PTSD	• GP service use, 73%
Stable mental health from initial interview to follow up.	• Experience of Mood disorders did not often reoccur	• Low drug and alcohol service use, 3.3%
• Most likely to be stable without disorder for mood disorders, anxiety disorders, psychosis, substance dependence & PTSD	• Most likely to have stable substance dependence disorder.	*Poor psychological functioning at follow up*
		• Highest levels of loneliness
		• Lowest level of self-mastery
		Persistent and worsening mental illness from initial interview to follow up.
		• Most likely to have persistent mood disorders, anxiety disorders & PTSD
		• Most likely to develop psychosis and substance dependence.

Supplementary Table: Change in mental health status from initial interview to second follow up ~20 months later by disorder category.

Disorder category	Change group n(%)			
	Stable no disorder	Improved	Developed disorder	Stable disorder
1.Mood disorder	64(71.1)	4(4.4)	9(10.0)	13(14.4)
2.Anxiety disorder	40(44.4)	21(23.3)	6(6.7)	23(25.6)
3.Psychosis	75 (83.3)	5(5.6)	9(10.0)	1(1.1)
4.Substance abuse	60(66.7)	19(21.1)	8(8.9)	3(3.3)
5.Substance dependence	42(46.7)	16(17.8)	10(11.1)	22(24.4)
6.PTSD	46(51.1)	16(17.8)	12(13.3)	16(17.8)