Title: Factors associated with access to care and healthcare utilisation in the homeless population of England.

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Acknowledgements: We are grateful to all the participants who gave up their time to take part in this research as well as the staff working in homeless services who conducted the surveys and agreed to share the data which has been used to in this paper.

Word count: 2,996

Tables: 4

Abstract

Introduction

People experiencing homelessness are known to have complex health needs which are often compounded by poor access to healthcare. This study investigates the individual-level factors associated with access to care and healthcare utilisation among homeless people in England.

Methods

A cross-sectional sample of 2,505 homeless people from 19 areas of England was used to investigate associations with access to care and healthcare utilisation.

Results

Rough sleepers were much less likely to be registered with a GP (OR 0.45, CI 0.30-0.66) than single homeless in accommodation (reference group) or the hidden homeless (OR 1.48 CI 0.88-2.50). Those who had recently been refused registration by a GP or dentist also had lower odds of being admitted to hospital (OR 0.67, CI 0.49-0.91) or using an ambulance (OR 0.73, CI 0.54-0.99).

Conclusions

The most vulnerable homeless people appear to face the greatest barriers to utilising healthcare. Rough sleepers have particularly low rates of GP registration and this appears to have a knock-on effect on admission to hospital. Improving primary care access for the homeless population could ensure that some of the most vulnerable people in society are able to access vital services which they are currently missing out on.

Abstract word count: 197

Introduction

Homeless health has been described as an example of "extreme health inequalities"(Geddes & Fazel, 2011). People experiencing homelessness are commonly affected by "tri-morbidity" (Hewett & Halligan, 2010), with the effects of physical illness, mental illness and substance misuse combining to produce very complex healthcare needs. The health problems of homeless people are often compounded by a lack of access to healthcare, though relatively little is known at present about the factors which affect access to healthcare for homeless people.

Although the term 'homeless' is often applied to people who sleep rough, the legal definition is much broader, encompassing anyone who has no home in the UK or elsewhere (Shelter, 2015) . This includes not only people who sleep on the streets but people whose accommodation is insecure e.g. those living in temporary accommodation or squatting (Feantsa, 2015).

Homelessness, then, exists in many forms. This paper is focused on the "non-statutory homeless", that is, people who are experiencing homelessness but do not meet the "priority need" criteria which would entitle them to be housed by their local authority under homelessness legislation (Homeless Link, 2015; Jones & Pleace, 2010). Even within this group, however, people experiencing different types of homelessness may have differing health issues and healthcare needs.

Like most high income countries, England has a sizeable homeless population (Fazel, Khosla, Doll, & Geddes, 2008). Official government estimates put the number of rough sleepers in England at 2,744 on a single night in Autumn 2014 (Department of Communities and Local Government, 2013), though this is thought to be a significant underestimate. In particular, it

does not include people living in night shelters and other homeless accommodation services. There are currently around 37,000 bed spaces available in accommodation for single homeless people in the England (Homeless Link, 2015) with around 100,000 people going through the system each year (Office of the Chief Analyst, 2010).

Mortality estimates for homeless people vary but standardised mortality ratios are commonly 2 – 5 times higher than for the general population (Fazel, Geddes, & Kushel, 2014). The risk of death from causes related to alcohol and infectious disease is particularly high (Hwang, Wilkins, Tjepkema, O'Campo, & Dunn, 2009; Morrison, 2009). Evidence from the United States suggests that deaths in homeless people are largely due to treatable illnesses and it is likely that the situation is similar in the England (Cabinet Office, 2010). In addition to the high risk of mortality, homeless people often experience multiple long-term health conditions. Substance misuse problems are common and this is often combined with mental health problems (Bramley et al., 2015).

Although their health needs are great, homeless people face multiple barriers to accessing healthcare (Canavan et al., 2012; Hill & Rimington, 2011; Riley, Harding, Underwood, & Carter, 2003).

In a sample of 2,505 homeless people from 19 areas in England, we investigated whether different types of homelessness were associated with different access to primary care (GPs registration) or GP utilisation. We also considered whether different types of homelessness and GP registration/utilisation were associated with secondary care utilisation (hospital admission, Accident and Emergency (A&E) use, and ambulance use). Finally, we examined whether GP registration mediates the association between different types of homelessness and use of secondary care.

Methods

Data and sampling

Data were obtained from surveys carried out by homeless service providers with support from Homeless Link, a national membership charity for organisations working directly with homeless people in England. The survey was developed through funding from the Department of Health in 2010 and designed in consultation with health and homelessness practitioners and policy makers. The final questions were signed off by the Department of Health.

The surveys were carried out in 19 areas across England between January 2012 and March 2014. Participants were recruited through homeless services including homeless accommodation projects, night shelters and day centres. The surveys were carried out by service providers and conducted through face-to-face interviews with homeless people using a standardised questionnaire.

The sample was not randomly selected as random sampling is not possible in the homeless population. Participants were asked to give verbal consent. Participants were excluded from this analysis if any of the following basic demographic information was missing: age, gender, sleeping status. Most of those excluded on this basis had completed very few of the survey questions.

For comparative purposes, data on GP registration rates in the general population were extracted from the Health Survey for England (NatCen Social Research and University College London, 2015), which includes a nationally representative sample of the population.

Measures

In England, Local Authorities have a statutory duty to provide accommodation for households deemed to be homeless and in 'priority need'. Participants in this study were all non-statutory homeless people (i.e. single homeless people who did not fit the definition of being in 'priority need'). They were grouped into three categories: "single homeless in accommodation", including those in hostels and night shelters; "rough sleepers"; and the "hidden homeless", including 'sofa surfers' and those who were squatting.

This study addresses access to primary care, as well as primary care and secondary care utilisation. We included two measures of access to primary care (GP registration and refusal of GP/dental registration in the last 6 months) as well as two measures of primary care utilisation (any GP utilisation in the last 6 months and any use of homeless health services in the past 6 months). Homeless health services are specialist services for people experiencing homelessness. These can include, for example, GPs and nurses located in homeless accommodation projects and day centres, or GP practices specifically for homeless people.

We also included three measures of secondary care utilisation in the last 6 months (any hospital admissions, any A&E use, and any ambulance use) as well as a composite measure: "hospital care use", which combined hospital admission with A&E utilisation over the last 6 months. The survey did not distinguish between emergency and elective hospital admissions and all outcome variables were binary (yes/no).

The primary exposure (independent) variables used were: housing status (single homeless in accommodation, hidden homeless, rough sleepers); GP registration (yes/no), used as an exposure variable in the analysis of access to secondary care; refusal of GP/dentist registration in the last 6 months; any use of homeless health services in the last 6 months.

A number of covariates were included in regression models to control for potential confounding effects. These included: age; sex; current smoker; current mental health problems (at least one symptom of mental health difficulties); current physical health problems (no, yes for less than 12 months, yes for more than 12 months); currently have/recovering from a drug problem; currently have/recovering from alcohol problem.

Statistical analysis

The basic characteristics of the sample have been described. We analysed the factors associated with access to primary and secondary care using logistic regression models giving results as odds ratios with 95% confidence intervals. Goodness of fit for logistic regression models was assessed using the Hosmer-Lemeshow test and specification tests were also applied.

A mediation model was applied to test the hypothesis that associations between sleeping status and secondary care outcomes are mediated by GP registration or refusal of GP/dentist registration. Results are shown as the percentage of total effects mediated, with confidence intervals. The *medeff* function in STATA 14 was used to apply this analysis (StataCorp, 2015).

GP registration rates for the general population were calculated from Health Survey for England data using appropriate weighting (NatCen Social Research and University College London, 2015).

Results

A total of 2,505 individuals participated in the survey. The characteristics of participants are shown in Table 1. The majority of participants were young (55.4% aged 35 years or younger)

and male (69.2%). Most were single homeless in accommodation (76.9). Mental health problems were particularly common: 85.5% of participants reported having current mental health problems, and 42.1% reported that they had been formally diagnosed with a mental health disorder. Over the previous 6 months, 26% of participants had been refused registration with either a GP or a dental service.

Table 2 shows that rough sleepers had low rates of GP registration (66.5%) compared to the single homeless in accommodation and the hidden homeless (83.1% and 88.4% respectively). By contrast, in a representative sample of the general population, in the Health Survey for England, 98.0% of adults were registered with a GP (NatCen Social Research and University College London, 2015). Table 2 also shows that rough sleepers had worse physical health and higher rates of drug and alcohol misuse than others.

The results of our analysis of the association between sleeping status and measures of primary care access are shown in

Table 3. There was an association between rough sleeping and GP registration which remained after adjusting for measures of health status (OR 0.45, CI 0.30-0.66), although no association was found between rough sleeping and GP utilisation (OR 0.71, CI 0.49-1.02).

Table 4 shows the results for factors associated with secondary care utilisation. Sleeping status was not associated with any of the secondary care outcome measures. In fully adjusted models refusal of GP/dental registration was negatively associated with ambulance use (OR 0.73, CI 0.54-0.99) and hospital admissions (OR 0.67, CI 0.49-0.91), whilst homeless health service use was positively associated with ambulance use (OR 1.62, 1.14-2.31). The results of model diagnostic tests indicated that all models with significant results showed adequacy of fit and good specification.

Table 5 summarises the results of the mediation analysis. No significant mediating effects were found. The full results (data available from the authors) also showed no direct association between sleeping status and secondary care use.

Discussion

Main finding of this study

Whilst 98.0% of the English general population are registered with a GP (NatCen Social Research and University College London, 2015), in our study 83.3% of single homeless in accommodation, 89.0% of hidden homeless people and just 65.5% of rough sleepers were registered. When we controlled for other factors, rough sleepers had less than half the odds of being registered with a GP compared to single homeless people in accommodation.

Secondary care utilisation seems to be influenced by different factors. In our study, the best predictor of secondary care utilisation was actually recent refusal of GP/dentist registration.

We had expected to find that poor access to primary care would be associated with higher rates of secondary care utilisation. There was some suggestion that this was the case for A&E attendance, as refusal of GP/dentist registration was associated with high rates of A&E attendance. This association was attenuated by adjustment for health status, though it may be that our study was under-powered to detect a difference here.

Clear associations were found, however, for hospital admission, though not in the expected direction. Previous studies have found that rates of hospital admission are higher in the homeless population than the general population. Our study compared admission rates within the homeless population and found that those who had recently been refused GP/dentist registration had significantly lower odds of being admitted to hospital (OR 0.67, CI 0.49 – 0.91). This was the reverse of what we had expected to find and may be explained by the gatekeeping role played by GPs in England.

Another unexpected finding was that homeless health service utilisation was associated with increased rates of ambulance utilisation (OR 1.62, CI 1.14 – 2.31). This finding requires further investigation but it may be that homeless health services tend to be used by the most needy homeless people, who are most likely to require emergency care.

The role of GPs as a gatekeeper was tested using a mediation model to determine whether GP registration or refusal of GP/dental registration mediated an association between sleeping status and secondary care use. No significant mediating effects could be detected. This could be due to unmeasured confounding or a lack of power to detect such effects. It may also be that no such effect exists but this needs to be confirmed by further, large-scale studies in the homeless population.

What is already known on this topic

The healthcare utilisation of homeless people in Western countries is commonly described as being characterised by high utilisation of emergency or unplanned care resulting (at least in part) from poor access to primary care services (Story, Aldridge, Gray, Burridge, & Hayward, 2014). It is has been estimated, for example, that homeless people in England use Accident and Emergency 5 – 7 times more often than the general population (NHS North West London, 2013; Office of the Chief Analyst, 2010).

The difficulties which homeless people have in accessing primary care in the UK have been described previously including: difficulty registering with a GP as they move between areas frequently and have no fixed address; problems with keeping appointments due to chaotic lifestyles; and lack of transport making it difficult to access services which are further than walking distance away (Canavan et al., 2012; Hill & Rimington, 2011; Riley et al., 2003). However, little is known about how different types of homelessness can influence healthcare utilisation patterns, or what other factors influence healthcare utilisation amongst homeless people.

A study from Canada (Hwang et al., 2010), which, like England, has universal health coverage, found that younger people, those who had been a victim of physical assault in the last 12 months, and those with lower mental and physical health scores had greater unmet need for health care but similar studies have not been carried out in Europe until now.

What this paper adds

This study adds to existing evidence that many homeless people have poor access to primary care. Importantly, it also shows that access to primary care appears to be influenced by the type of homelessness which people are experiencing, with rough sleepers

having the worst access and lowest rates of utilisation. It demonstrates, therefore, that even within the homeless population, some are more disadvantaged than others.

Contrary to previous descriptions of homeless healthcare utilisation, we found evidence that those homeless people who have most difficulty in accessing primary care may also face the greatest barriers to utilising secondary care; rough sleepers, who have especially low rates of registration with GPs were least likely to be admitted to hospital for treatment. Although the data do not allow us to make normative judgements about the absolute level of secondary care utilisation (that is, we cannot tell whether these people are receiving 'sufficient' hospital care), nevertheless the pattern observed suggests that problems in accessing primary care may mean that some people experiencing homelessness, who are in greatest need, do not receive important inpatient treatment.

Limitations of this study

Homeless people are one of the hardest population groups for health researchers to reach. By working with a range of homeless service providers, Homeless Link has been able to gather a remarkably large sample using a standardised and pre-tested questionnaire. Nevertheless, there are important limitations to the study. In particular, the sampling was not random. The survey was carried out amongst those who have contact with homeless services and importantly the data do not include information on how many people refused to participate. However, a high proportion of single homeless people are likely to be in contact with such services and the demographics of the sample reflect other research conducted on single homelessness (Homeless Link, 2015). High participation rates were also reported anecdotally by the service providers conducting the survey.

As non-statutory homeless people are not included in any routine statistics (such as the census) a formal assessment of the representativeness of our sample was not possible though a study from the US found that samples taken from homeless shelters can provide good approximations of the homeless population as a whole (Koegel, Burnam, & Morton, 1996). Unfortunately, similar evidence does not exist for the UK. The inferential statistical methods used to analyse our data assume a random sample. As this assumption cannot be verified, there is a risk that the results were biased by having a non-representative sample.

Our study relied on self-reported information on all variables including measures of healthcare utilisation. This might have made it vulnerable to recall bias. A study of the accuracy of self-reports in homeless adults in the United States (Gelberg & Siecke, 1997) found that they reported ambulatory visits quite accurately, though reports of the number of such visits were less accurate.

A limitation of the survey design was that it did not allow a distinction to be made between refusal of GP and dentist registration. However, this variable was used as a proxy indicator of access to primary care and the nature of the registration refusal does not invalidate its use in this way. Finally, this was a cross-sectional study, which makes causal inference risky though temporal relations make it unlikely that the observed associations were brought about by reverse causality.

Conclusion

The extreme health needs of people experiencing homelessness combined with the difficulties they have in accessing health care are an example of the inverse care law at work. Not only do homeless people have greater difficulty in accessing healthcare than the

general population, we have found evidence that even within the homeless population, the most vulnerable are particularly disadvantaged when it comes to accessing healthcare.

It is often assumed that giving homeless people better access to primary care would reduce their use of secondary care. This may well be true for Accident and Emergency services, though our results are somewhat inconclusive on this point. Our study suggests, however, that the relationship between primary and secondary care access for homeless people is more complex. It is possible that better access to primary care for homeless people might give some better access to vital hospital inpatient services for people who would otherwise miss out.

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Tables

Table 1. Demographic characteristics of 2,505 homeless participants

Variable	% (number)
All	
Age Group	2505
<25	34.8% (871)
26-35	20.6% (515)
36-45	22.6% (566)
46-55	15.0% (375)
56-65	5.5%(138)
>66	1.6% (40)
Gender	2,498
Male	69.2% (1731)
Female	30.7% (767)
Sleeping Status	1,713
Single Homeless in accommodation	76.9% (1321)
Hidden homeless	11.1% (190)
Rough Sleepers	12.0% (206)
GP/Dental Refusal	1,546
yes	26.0% (402)
Homeless Health Service Registered	708
no	62.6% (443)
yes, permanent	26.3% (186)
yes, temporary	11.2% (79)
Current smoker	1,798
Yes	78.8% (1416)
Current or Recovering Drug Problem	1,689
Yes	38.9% (657)
Current or Recovering Alcohol Problem	1,726
Yes	30.2% (521)
Combined Drug Problem and Alcohol Problem	1,448
Yes	11.3% (163)
Any Reported Mental Health Difficulties	1,509
None	14.5% (218)
Yes, 12 months or less	46.1% (695)
Yes, 12 months or greater	39.5% (596)
Diagnosed Mental Health Disorder	1,543
Don't Know/Prefer Not to Say	7.6% (117)
None	50.4% (777)
Yes	42.1% (649)
Any Reported Physical Health Problems	1,460
Yes	76.4% (1,116)
Long Term Self-Reported Physical Health Problems (> 12 months)	1,460
Yes	35.5% (519)

Table 2. Characteristics of 1,717 homeless individuals by sleeping status

Variable	Single Homeless* (n=1321)	Hidden Homeless (n=190)	Rough Sleepers (n=206)	P**
Age Group	**N=1304**	**N=188**	**N=205**	
<25	42.8% (558)	28.7% (54)	17.6% (36)	
26-35	18.3% (239)	32.0% (60)	24.4% (50)	
36-45	18.2% (238)	25.5% (48)	30.7% (63)	<0.001
46-55	13.1% (171)	10.1% (19)	20.0% (41)	
56-65	5.8% (75)	3.2% (6)	6.8% (14)	
>66	1.8% (23)	0.5% (1)	0.5% (1)	
Gender				
Male	69.2% (897)	33.3% (62)	14.2% (29)	
Female	30.7% (398)	66.7% (124)	85.8% (175)	<0.001
GP Registration				
No	16.9% (217)	11.6% (21)	33.5% (65)	<0.001
Yes	83.1% (1066)	88.4% (160)	66.5% (129)	
GP/Dental Refusal				
No	74.3% (887)	69.4% (120)	79.1% (155)	
yes	25.8% (307)	30.6% (53)	20.9% (41)	0.11
Homeless Health Service Registered				
No	69.1% (326)	54.5% (55)	61.6% (45)	
yes, permanent	21.4% (101)	31.7% (32)	19.2% (14)	<0.001
yes, temporary	9.5% (45)	13.9% (14)	19.2% (14)	
Smoking Status				
No	21.8% (258)	19.3% (33)	17.4% (34)	
Yes	78.2% (926)	80.7% (138)	82.6% (161)	0.134
Drug use (Past month)				
No	63.6% (720)	58.0%(94)	47.6% (88)	0.002
Yes	36.4% (412)	42.0% (68)	52.4% (97)	
Current or Recovering Alcohol Problem				
No	75.5% (876)	76.5% (127)	58.1% (108)	<0.001
Yes	24.5% (285)	23.5% (39)	41.9% (78)	
Any Reported Mental Health Difficulties				
None	15.7% (197)	14.8% (27)	8.7% (16)	
Yes, 12 months or less	45.1% (565)	42.6% (78)	52.2% (96)	0.09
Yes, 12 months or greater	39.1% (490)	42.6% (78)	39.1% (72)	
Diagnosed Mental Health Disorder				
Don't Know/Prefer Not to Say	15.3% (197)	11.0% (20)	9.3% (18)	
None	44.0% (565)	52.7% (96)	45.9% (89)	0.180
Yes	38.1% (490)	36.3% (66)	44.8% (87)	
Any Reported Physical Health Problems				
No	27.0% (326)	22.5% (38)	13.0% (23)	0.001
Yes	73.0% (883)	77.5% (131)	87.0% (154)	

Table 3. Multivariable logistic regression analysis of the association of sleeping status with GP registration and GP utilisation

	GP Registration		GP Utilisation	
	Model 1* (n=1,459)	**Model 2** (n=1,291)**	**Model 1* (n=1,459)**	**Model 2** (n=1,307)**
Variable Sleeping Status	**OR (CI)**	**OR (CI)**	**OR (CI)**	**OR (CI)**
Single Homeless	1	1	1	1
Hidden Homeless	1.62 (0.96-2.70)	1.48 (0.88-2.50)	1.18 (0.81-1.72)	1.22 (0.83-1.83)
Rough Sleepers	**0.40 (0.28-0.58)**	**0.45 (0.30-0.66)**	**0.62 (0.45-0.87)**	0.71 (0.49-1.02)

***Model 1 – adjusted for age and sex**

****Model 2 - adjusted for age, sex, smoking status, reported physical status, reported mental status, current or recovering from a drug addiction and current or recovering from an alcohol addiction**

Table 4. Multivariable logistic regression analysis of factors associated with hospital utilisation in homeless people

	Hospital Care Use *		A&E Use		Hospital Admissions		Ambulance Use	
	Model 1** (n=1,454)	Model 2*** (n=1,310)	Model 1** (n=1,454)	Model 2*** (n=1,310)	Model 1** (n=1,445)	Model 2*** (n=1,309)	Model 1** (n=1,454)	Model 2*** (n=1,316)
Variable	**OR (CI)**	**OR (CI)**	**OR (CI)**	**OR (CI)**	**OR (CI)**	**OR (CI)**	**OR (CI)**	**OR (CI)**
Sleeping Status								
Single Homeless	1	1	1	1	1	1	1	1
Hidden Homeless	0.89 (0.56-1.41)	0.81 (0.50-1.30)	0.84 (0.58-1.21)	0.77 (0.52-1.13)	1.13 (0.79-1.64)	1.18 (0.79-1.77)	0.88 (0.59-1.29)	0.96 (0.63-1.48)
Rough Sleepers	0.76 (0.49-1.18)	0.8 (0.49-1.30)	1.00 (0.69-1.44)	1.04 (0.69-1.56)	0.91 (0.62-1.33)	0.86 (0.56-1.31)	1.17 (0.82-1.67)	1.10 (0.74-1.64)
GP Registration								
Yes	1	1	1	1	1	1	1	1
No	1.09 (0.74-1.60)	1.11 (0.73-1.67)	0.98 (0.73-1.32)	0.97 (0.70-1.33)	0.85 (0.62-1.16)	0.86 (0.61-1.21)	0.98 (0.72-1.32)	1.02 (0.73-1.41)
GP or Dental Refusal								
No	1	1	1	1	1	1	1	1
Yes	1.05 (0.76-1.46)	1.00 (0.70-1.41)	**1.32 (1.01-1.73)**	1.31 (0.90-1.61)	**0.63 (0.48-0.84)**	**0.67 (0.49-0.91)**	0.77 (0.58-1.01)	**0.73 (0.54-0.99)**
Homeless Health Service Use								
No	1	1	1	1	1	1	1	1
Yes	0.88 (0.58-1.35)	0.91 (0.58-1.42)	0.95 (0.68-1.33)	1.03 (0.71-1.48)	**1.46 (1.06-2.02)**	1.37 (0.96-1.97)	**1.59 (1.15-2.21)**	**1.62 (1.14-2.31)**

Abbreviations: OR, Odds Ratio; CI, 95% confidence interval

* Hospital Care Use is a combined analysis of both AE access and Hospital Access in the past 6 months

**Model adjusted for age and sex

*** Model adjusted for age, sex, smoking status, reported physical status, reported mental status, current or recovering from a drug addiction and current or recovering from an alcohol addiction

Table 5. Percentage of association between sleeping status and secondary care use mediated by GP registration and refusal of GP/dental registration in mediation analysis

Exposure	Mediator	Adjustment	Percentage of Total Effect Mediated											
			Hospital care use			A&E use			Hospital admission			Ambulance use		
			Mean	*95% CI*		*Mean*	*95% CI*		*Mean*	*95% CI*		*Mean*	*95% CI*	
Sleeping status	GP Registration	Minimal[a]	7.15%	(-141.8%,	153.3%)	-1.29%	(-27.7%,	30.3%)	2.95%	(-64.5%,	42.9%)	5.13%	(-55.8%,	51.6%)
		Full[b]	-2.30%	(-85.9%,	115.4%)	0.42%	(-12.4%,	9.7%)	4.91%	(-85.5%,	67.5%)	3.49%	(-107.6%,	109.4%)
	Refusal of GP/Dental registration in last 6 months	Minimal[a]	-0.75%	(-31.0%,	14.3%)	0.003%	(-0.05%,	0.1%)	0.90%	(-12.4%,	12.3%)	0.09%	(-1.6%,	1.4%)
		Full[b]	1.05%	(-35.3%,	17.8%)	-0.86%	(-13.2%,	8.3%)	-1.38%	(-28.2%,	24.2%)	0.42%	(-12.4%,	9.7%)

[a] Adjusted for age, sex.

[b] Adjusted for age, sex, smoking status, any physical health problem, any mental health problem, drug use, alcohol problem