Psychiatry Research xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Frequent users of Mental Health Liaison Services within Emergency Departments

Alison Beck[a,*], Emma Sanchez-Walker[a], Lauren J. Evans[a], Victoria Harris[b], Ruth Pegler[a], Sean Cross[c]

[a] Department of Psychology, Maudsley Hospital, Denmark Hill, London SE5 8AZ, UK
[b] Department of Biostatistics, Institute of Psychiatry, Psychology and Neuroscience, London SE5 8AF, UK
[c] Department of Psychological Medicine, Kings College Hospital, Denmark Hill, London SE5 9RS, UK

ARTICLE INFO

Keywords:
Mental Health Liaison Service
Emergency Department
Frequent attender

ABSTRACT

This study aimed to use nuanced statistical methods in a large UK sample to identify and explore the factors associated with different types of frequent user of Emergency Departments (EDs) who are referred to Mental Health Liaison Services (MHLS). A retrospective 5-year longitudinal study was conducted of all attenders (n = 23,718) of four London EDs who were referred to their MHLS. Longitudinal group-based trajectory analysis of monthly MHLS referrals enabled identification of factors which may contribute to membership of the resulting groups. Analysis revealed six clusters representing distinct attendance patterns; three clusters of these were identified as frequent attender groups (occasional, intermediate, heavy) containing 1119 people (4.7%). This 4.7% of the sample accounted for 24.2% of all admissions. Factors significantly related to membership of each of these groups were: having been involuntarily detained under the Mental Health Act, a higher number of care coordinators, and a diagnosis of substance abuse. The study revealed three clusters of frequent ED users with a MHLS referral who were more likely to have certain clinical and social care needs. A small proportion of clients identified as frequent users (4.7%) were responsible for nearly a quarter of all admissions (24.2%) during this timeframe.

1. Introduction

Mental Health Liaison Services (MHLS) are located within the Emergency Department (ED) and staffed 24 h a day by a team of mental health professionals, including psychiatric liaison nurses and psychiatrists. People are referred to the MHLS by ED doctors and nurses at any stage of their time in the ED if they are assessed as needing mental health input and management, with the MHLS managing all psychiatric emergencies in the ED. Previous research has found that people who frequently present at MHLS through the ED or psychiatric emergency rooms are a small group of individuals who use a disproportionately large proportion of resources (Arfken et al., 2004; Chaput and Lebel, 2007a, 2007b; Ledoux and Minner, 2006; Pasic et al., 2005).

Learning from the available research is currently limited by the different definitions of frequent attenders, though most studies have used arbitrary cut-offs ranging from four (Hansagi et al., 2008) to twelve attendances a year (Chan and Ovens, 2002). Relatively few papers have attempted to statistically define frequent attendance at EDs; however of those which exist the majority have defined frequent attenders as having four or more attendances over a one-year period. Murphy et al. (1999) monitored attendances to the ED over a year and found that of the near 35,000 attenders, 2.7% attended more than 4 times and accounted for 11.2% of all admissions during the same year. Hunt et al. (2006) chose to use the same cut off of four or more attendances as it represented the top 25% of general ED attendances and created a group that was a clinically useful in both size and impact. Though these two studies both used the same cut-off, the proportion of clients falling into the 'frequent' attender group varied dramatically (from 2.7% to 25%) and may reflect that Hunt et al. (2006) used a retrospective survey method to assess ED visits which may not have been as reliable as recording the visits as they happened. That being said, Locker et al. (2007) arrived at the same cut-off using a Poisson distribution, which is also supported by Moore et al. (2009) who found that a change in patients' personal profiles first appeared at the fourth annual attendance and the change became more pronounced as attendances increased. The aforementioned papers had samples in excess of

Abbreviations: ED, Emergency Departments; MHLS, Mental Health Liaison Service

* Correspondence to: Maudsley Hospital, M/4/1/0240 First Floor Administration Building, Denmark Hill, London SE5 8AZ, UK.
E-mail address: alison.beck@slam.nhs.uk (A. Beck).

http://dx.doi.org/10.1016/j.psychres.2017.08.006
Received 13 June 2016; Received in revised form 31 May 2017; Accepted 8 August 2017

20,000 patients and begin to show some consistency; however all of these studies are derived from general ED populations and not mental health patients in particular who may show different attendance patterns.

Studies which have attempted to identify and explore the characteristics of frequent attenders specifically within mental health populations have varied in size with the two largest studies (Chaput and Lebel, 2007a, 2007b; Pasic et al., 2005) based at US and Canadian hospitals. These studies used simple statistical methods such as a cut-off of two standard deviations, or grouping attenders based on 1, 2, 3–10, and eleven or more attendances. Smaller studies (less than 2500 patients) of psychiatric ED attendees have also relied on similar statistical methods such as isolating outliers (Ledoux and Minner, 2006) or using clinical custom and practice (Arfken et al., 2004). Again, these smaller studies were based outside the UK making comparisons difficult and reducing the applicability to a UK sample. Though there have been previous large UK studies, these have all focused on general ED attendees rather than psychiatric patients, though one small UK study was conducted on psychiatric ED patients by Da Cruz et al. (2011) who used a cut-off of four or more admissions based on the findings from previous general ED studies (Hansagi et al., 2008; Murphy et al., 1999).

Moore et al. (2009) found an ongoing change in patients' general demographic and clinical factors from the fourth attendance, suggesting that these changes may continue as attendances increase. Using more nuanced statistical methods could allow the identification and investigation of any further sub-populations, rather than relying on the dichotomy of frequent compared to non-frequent attenders. Simply splitting the patients into two groups would not discriminate these ongoing changes, and cannot detect any further groups that may appear at later stages (e.g from 10, 12 or more attendances).

Though some of the larger frequent attender studies have been conducted in the UK, they have either been based on a general (rather than psychiatric) population, or used simple statistical methods which may not capture any other possible types of attender. The present study is unique as it uses more nuanced statistical analyses to identify underlying psychiatric ED frequent attenders from a large UK dataset spanning four EDs. The aims of this study therefore were to explore whether distinct groups of frequent attenders requiring referral to MHLS could be identified by statistical method, and to explore characteristics associated with membership of these groups.

2. Methods

2.1. Study design and setting

This is a five year longitudinal study of people attending MHLS located within four busy urban EDs. The service evaluation was approved by the local Audit Committee, with all data remaining secure, anonymous and confidential.

The four EDs and their associated MHLS used in this study are all part of the same London Mental Health National Health Service (NHS) Trust. The trust covers four boroughs, comprising a population of 1.2 million people (Office of National Statistics, 2012). The catchment area is geographically large as well as being ethnically and socially diverse. 55% are White and 24.7% Black/African/Caribbean/Black British, compared to 85.3% and 3.5% in England (Office of National Statistics, 2013). There is also higher than average unemployment (7.5%) than the UK (6.5%) or London (7.1%) (Office of National Statistics, 2014). The average index of multiple deprivation (IMD) score is 28.7, which is 7 points higher than England, indicating a more deprived area (Department for Communities and Local Government, 2010).

2.2. Data collection

Attendance data for patients presenting at ED with a mental health problem resulting in a subsequent referral to MHLS between 1st January 2009 and 31st December 2013 were collected using the local mental health trust electronic patient records. These records are an anonymised copy of the NHS Trust's paperless electronic records, including clinical and administrative data and free-text data, maintained by the local Biomedical Research Centre. Patients can be referred from the ED to the MHLS by doctors and nurses at any stage of their time in the ED. The variables investigated included social situation information (housing, employment, relationship status), clinical diagnosis (ICD-10 code) and details of mental health care received (involuntarily detained under the Mental Health Act, number of care coordinators). This data was collected from patients and is either self- or clinician-rated. The dataset consisted of details of each MHLS referral over the 5 year study period, including the number of attendances per person (count data). Data were checked and cleaned for any inconsistencies. The service evaluation was approved by the local Audit Committee and the CRIS Oversight Committee (14-008).

2.3. Data analysis

To explore whether there were distinct groups of ED attenders with a MHLS referral and consider whether frequent attenders could be identified, group based trajectory analysis was used. This is a method for identifying clusters of individuals who follow certain trajectories over time (Nagin, 2005, 1999). MHLS referral data is skewed with high numbers of patients with single attendances per month, and fewer patients with higher numbers of admissions per month, warranting the use of a Poisson model. The first time point was taken to be the first month of attendances for an individual after a period of zero attendances (i.e. at least one month with no attendances).

These groups were chosen as they each have defining factors that would make their identification and focus clinically useful. Frequent user groups were chosen based on either a markedly high number of admissions or a maintained elevated number of admissions.

Following identification of groups using the above techniques, their characteristics were explored further using cross tabulations and multinomial logistic regression to identify factors associated with group membership, with odds ratios presented for those characteristics associated with frequent attender groups. The variables included relationship status, housing status, employment status, whether patients had been involuntarily detained under the Mental Health Act and number of care coordinators. Clinical diagnosis data was also investigated but the numbers were too low to analyse using this method, therefore the proportions of each are reported.

3. Results

3.1. Group based trajectory analysis

During the study time frame 23,718 people had at least one MHLS referral after attending the ED. A number of methods for generating a group trajectory model were explored. In order to combat the data skew a Zero-Inflated Poisson (ZIP) (Ridout et al., 1998) method was applied. The total number of groups was assessed using the Bayesian Information Criterion (BIC) and the Akaike Information Criterion (AIC) (Bozdogan, 1987; Burnham and Anderson, 2003; Vrieze, 2012). These models were fitted using a Stata plugin for grouped trajectory models (Jones et al., 2001; Jones and Nagin, 2012, 2013) in Stata 12 (StataCorp, 2011). Both the BIC and AIC identified the zero-inflated Poisson model with six clusters as the model of best fit, using the lowest absolute value due to the reversal of signs during analysis (Jones et al., 2001) (Table 1). Missing data were included in the analyses as categories within each variable, though it should be noted that there were high levels of missing data for employment and housing status (78.7% and 71.8% of the sample, respectively) therefore these results should be approached with caution. The BIC and AIC values for the 5, 6 and 7 class models are shown below (Table 1).