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DOI:

[10.1016/j.genhosppsy.2015.07.006](https://doi.org/10.1016/j.genhosppsy.2015.07.006)

Document Version

Peer reviewed version

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Citation for published version (APA):

Lally, J., Lun Wong, Y., Shetty, H., Patel, A., Srivastava, V., Broadbent, M. T. M., & Gaughran, F. P. (2015). Acute hospital service utilization by inpatients in psychiatric hospitals. *GENERAL HOSPITAL PSYCHIATRY*, 37(6), 577–580. <https://doi.org/10.1016/j.genhosppsy.2015.07.006>

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Title: Acute hospital service utilisation by inpatients in psychiatric hospitals

Abstract

Objective

Standardised mortality ratios are twice the population average in the year following a mental health admission, yet there is a relative paucity of research on uptake of general medical care in psychiatric inpatients.

Methods

A retrospective database analysis was performed to ascertain the frequency of acute medical care usage by psychiatric inpatients. Data was gathered through a static linkage between anonymised clinical records in a large UK Mental Health Provider and the national hospital activity database (Hospital Episode Statistics (HES)) over one year from 2010 to 2011.

Results

Over the year, 10.4% of the 8023 psychiatric admission episodes included at least one night in a general hospital during that psychiatric inpatient stay, while 12.0% of psychiatry admission episodes entailed an Emergency Department (ED) visit. Over the course of the full year, of the 4,674 people admitted to the Mental Health Provider at least once, 16.0% were admitted to a general hospital while registered as a mental

health inpatient and 18.0% were seen in the Emergency Department (ED). Patients were simultaneously registered as occupying beds in both general and psychiatric hospitals for a total of 5163 bed days at a cost of £2.4 million over the year.

Conclusion

This large population based linkage study indicates a high rate of general hospital utilisation by psychiatric inpatients in an independent mental health provider. The need for combined, flexible and practical approaches to the medical care of psychiatric inpatients is highlighted, to reduce unplanned care and provide treatment in the site best suited to the patient's needs.

Title: Acute hospital service utilisation by inpatients in psychiatric hospitals

People with severe mental illness (SMI) have high rates of physical co-morbidity [1]. Some of these may be regarded as complications of the psychiatric condition, such as self-injury or self-poisoning, but many derive from the high rates of common medical problems in people with SMI. Life expectancies in people with psychosis are shortened by 15-25 years[2], mainly through natural causes [3] ; a substance use diagnosis shortens life expectancy by 14-15 years [2], and personality disorder by 18-19 years[4].

Studies from across the globe highlight that patients with mental health diagnoses receive suboptimal acute medical care [5-7], and that preventative approaches such as screening for cardiovascular risk factors are inconsistently applied [8, 9]. Long-term physical conditions may only come to light upon admission to a mental health ward. The trend in the UK towards community management of mental health problems where possible may mean that any co-existing physical health conditions may be more complicated by the time the patient is admitted to a mental health unit.

The presence of medical comorbidities can impact negatively on the severity of psychiatric symptoms[10], psychiatric recovery[11], the length of psychiatric hospital admission[12] and the length of general hospital admission[13]. Yet the quality and

comprehensiveness of medical care for psychiatric inpatients remains highly variable. Training for general and mental health nursing is separated at a very early stage, while Cartesian dualism leads to a culture where psychiatrists look after illness of the mind and other doctors look after bodily problems. These attitudes are now actively being challenged and attempts to redefine psychiatry as caring for the whole person, body and mind, are being promulgated.

Psychiatric hospitalisation is the most expensive component of mental health care [14]. Any additional general hospital costs incurred during the course of a psychiatric admission stretch the budget further. Such activity has not been quantified in Europe, although a Californian survey over 30 months, found that 0.5% per annum of their psychiatric inpatients were hospitalised for medical treatment, [15].

In this study we sought to investigate acute hospital bed and Emergency Department (ED) usage by psychiatric inpatients and the associated economic costs.

Method

A retrospective database analysis was carried out using a linkage between the Clinical Record Interactive Search (CRIS) database[16] in the South London and Maudsley National Health Service (NHS) Foundation Trust (SLaM) and the UK Hospital Episode Statistics (HES) database over a one year period from 14 December 2010 to 13 December 2011 inclusive.

SLaM is one of Europe's largest providers of secondary mental healthcare and provides comprehensive secondary mental healthcare to approximately 1.2 million residents of four London boroughs, as well as a number of national specialist services. It has 68

psychiatric inpatient wards at four different hospital sites. One site is at a general hospital, but general medical care is not integrated with the psychiatric inpatient service. There are no embedded medical services to the general psychiatric inpatient wards.

From 2006 onwards, electronic psychiatric clinical records (EPCRs) have been used across all SLaM services. In 2008 the Clinical Record Interactive Search (CRIS) system, supported by the National Institute for Health Research (NIHR) Specialist Biomedical Research Centre for Mental Health, was developed to enable researchers to efficiently search EPCRs and retrieve anonymised clinical information. The protocol for this case register has been described in detail in an open-access publication[16] [17].

Psychiatric diagnoses were based on the 10th edition of the World Health Organization International Classification of Diseases (ICD-10) and reflected the clinical diagnoses recorded in the electronic notes. Multiple diagnoses may be recorded, but for the purposes of this study, only primary diagnoses are displayed here.

Hospital Episode Statistics (HES) is a data warehouse containing details of all admissions and Emergency Department attendances to National Health Service (NHS) hospitals in England (<http://www.hscic.gov.uk/hes>). The HES database is populated with clinical data recorded by specially trained clinical coders from patients' medical records at the time of hospital discharge. Primary ICD-10 medical diagnoses, relating to the general hospital admission were retrieved from HES. The primary diagnosis is defined by the Department of Health as the main condition treated or investigated during the relevant episode of health care[18].

An extract of the (HES) database for the relevant time period was linked with CRIS, through a secure and approved linkage carried out by the Health and Social Care Information Service (HSCIC) data linkage and extracts team. The fully anonymised linkage identified all admissions and ED care episodes at all UK NHS general hospitals and EDs of people simultaneously registered as a psychiatric inpatient in SLaM. CRIS was approved as a dataset for secondary analysis in this study by the Oxfordshire Research Ethics Committee C, reference 08/H0606/71.

The cohort consisted of individuals occupying SLaM psychiatric inpatient beds during the specified one-year observation period. We did not separately identify patients from Child and Adolescent services, and we excluded patients from the UK National Psychosis Service as that unit has a special interest in people with medical co-morbidities and so would potentially bias the sample.

This cohort was then cross referenced with HES to identify patients admitted to a general hospital or ED setting anywhere in England. As it is not uncommon for patients to be transferred between general hospitals and psychiatric inpatient settings on the day of mental health admission, the period of interest was defined from day 2 of a psychiatric admission until the day of discharge from the psychiatric inpatient setting.

The patient variables available were as follows, gender; age range; ethnicity; primary mental disorder ICD-10 diagnosis; date of psychiatric admission and discharge; a psychiatric admission under mental health act legislation (involuntary or compulsory commitment) ; primary HES ICD-10 diagnosis; date(s) of general hospital admission and discharge; date(s) of ED visit; admission type (general hospital or ED).

Main outcome measures

We sought to establish the number and primary diagnoses of general hospital admissions and ED presentations of psychiatric inpatients and the economic costs of the contacts over the 1 year study period

Costs of general hospital admissions and ED visits were estimated by multiplying total bed days and ED visits by their respective unit costs: £458 per bed day (average across all specialties) and £108 per ED attendance without hospital admission [19].

The frequency of ICD-10 diagnostic categories for general hospital admissions are presented by psychiatric service category where the patient was admitted (Acute and general adult psychiatry (e.g. psychiatric intensive care units, psychiatric general and triage wards; old age psychiatry services; forensic psychiatry settings)

We also recorded whether the patient was compulsory detained under mental health act legislation (involuntary commitment) at the time of the general hospital transfer or admission, as this has economic implications in terms of nursing escorts (sitters).

Results

Admissions to general hospitals

During the study period 4674 patients (53.1% male) were admitted to psychiatric inpatient beds, during 8023 psychiatric inpatient admission episodes, giving a total of 358,666 bed days (201,317 days used by males). Fifty five percent of psychiatric admission episodes (n=4417 admission episodes) were for patients admitted

involuntarily under the jurisdiction of the Mental Health Act (MHA) (1983, amended 2007) (involuntary commitment).

Eight hundred and thirty one (10.4%) of the 8023 psychiatric admission episodes incorporated at least one night in a general hospital as part of that psychiatric inpatient stay and 983 (12.0%) incorporated at least one trip to an ED. Of these general hospital admission episodes, 41.0% involved those hospitalised under mental health act legislation. Fifty percent of these general hospital admission episodes were of people admitted with diagnoses of psychotic or affective illnesses; (26.0% (n=218) with a diagnosis of schizophrenia, schizoaffective disorder, or delusional disorder and 24.0% (n=196) an affective disorder). This reflects the dominance of that diagnostic group in the mental health inpatient population.

Economic costs:

Of the psychiatric inpatients, 16.0% (740(350 male)) of psychiatry inpatients had a general hospital admission over the one-year study period over the course of one or more psychiatry admissions, 329 (44.0%) of whom were detained under mental health act legislation. Thirty percent of psychiatry inpatients (n=552) aged over 65 required a general hospital admission.

Over the year studied, 18.0% (N= 855) of psychiatric inpatients attended ED, with a total of 1318 ED attendances. By sex, 16.0% of male (N= 404) and 21.0% of female psychiatric inpatients (N=451) attended ED. Forty one percent (n=540) of ED attendances were of patients involuntarily detained under the mental health act legislation.

Overall, people registered as psychiatry inpatients occupied beds in general hospitals for a total of 5163 bed days over the year of study, in a total of 29 different hospitals. The mean duration of general hospital admission was 7 days (SD=1.3) per person admitted, over one or more mental health admissions. Female psychiatry inpatients occupied 3063 general hospital bed days with a mean length of stay (LOS) of 7.9 days, while males used 2100 general bed days with a mean LOS of 6 days.

Patients were simultaneously registered as occupying beds in both general and psychiatric hospitals for a total of 5163 bed days at a cost of £2.4 million. The cost of 1318 attendances at ED, assumed to be uncomplicated, was an additional £142,344. Data were not available to calculate costs for staff escorting patients to general hospital settings.

Reasons for General Hospital Admission

The most frequent general hospital discharge diagnoses for those transferred from a general adult psychiatric setting were poisoning (n=82); diseases of the respiratory system (n=52); injuries (n=39); general symptoms relating to the respiratory and circulatory systems (n=26) and diabetes mellitus (n=13).

Those admitted from addiction services were most commonly admitted for alcohol withdrawal (n=46) and medical complications relating to alcohol intoxication (n=23). The most common reason for a general hospital admission from a forensic setting was neoplasm (n=10/48).

From Mental Health of Older Adult settings, the most common reasons for a general hospital admission were diseases of the circulatory system (n=47), diseases of the

respiratory system (n=42), diseases of the renal or urinary systems (n=36) and general symptoms or abnormal clinical or laboratory findings with no diagnosis made (n=70).

Discussion

This is the largest study known to us evaluating the frequency of general hospital referrals and admissions from independent psychiatric inpatient facilities. The study's central finding was that a tenth of psychiatric admission episodes incorporate at least a night in a general hospital and 12.0% of psychiatric admission episodes incorporated an ED attendance.

The annual rate of admission of psychiatric inpatients of 16% is much higher than in other studies, both from North America, which reported that 6.8% [20] and 0.5% per annum respectively [15] of patients were transferred for general hospital admissions from standalone psychiatric hospital settings.

The 18.0% of psychiatric inpatients (N= 855) transferred to ED over the year however, is comparable to the 14.0% transferred to a general hospital setting from a psychiatric hospital over a one year period in one US study [20].

The £2.4 million cost of general hospital admission for people simultaneously registered as inpatients in both general and psychiatric settings over the one year study period is substantial, with an additional £142,344 for ED attendances. These figures did not include the additional costs of ambulance transport and nursing escorts as we did not have access to that information. However, we do know that 41.0% percent of general

hospital and ED admission episodes involved patients involuntarily detained under mental health act legislation. These patients require staff to escort them continuously for the duration of their general hospital attendance and/or admission – a significant further expenditure. Patients when admitted informally or voluntarily to hospital in the UK are escorted to general hospitals on the basis of clinical need. In practice, as the threshold for inpatient hospitalisation in the UK is high, a significant proportion of such patients are also accompanied by staff from the mental health unit.

Simultaneous registration in both psychiatric and general hospital beds is an inefficient use of resources. Moreover, the hospital transfer process is often distressing for people at a time when their mental health is poor.

Eight of the top ten diagnostic categories in terms of length of stay of National Health Service (NHS) hospital admissions are psychiatric disorders [21]. However, defining predictors of longer psychiatric hospital stays remains an elusive goal [22, 23]. One of the few studies on the subject found that the presence of medical comorbidity necessitating a general hospital referral was associated with a significantly increased length of psychiatric hospitalisation [12]. Given the high rates of general hospital admission in this study, it is likely that there are economic implications for both general medical and psychiatric services.

While the most common reason for medical admission from a general adult psychiatry setting were poisoning or external injury, which may arguably relate to the presenting psychiatric problem, 75% of general hospital admissions were due to primary medical conditions.

This high level of general hospital need in psychiatric inpatients partially reflects the extent of physical health co-morbidities in this population, but is likely to be amplified by system factors. Raising the threshold for inpatient psychiatric admission means that any co-existing physical health condition may deteriorate in line with an individual's mental health. In the UK, home treatment teams can see a patient up to twice a day seven days a week while they are acutely unwell, thus avoiding the need for psychiatric hospital admission. One criterion for admission may be inadequate management of physical health in the community setting.

Once a patient is admitted, the division between mental health and physical health becomes even more important. Mental health nursing training in the UK is no longer integrated with general nursing training, while psychiatrists may have lost clinical confidence over time in managing physical health problems. The infrastructure for physical examination and management on inpatient wards can be variable. Links to medical teams tend to be informal, based on goodwill with few centres, outside of Mental Health of Older Adult or Forensic settings, having formal embedded physical health care. This could contribute to delays in identifying and managing early stages of medical deterioration and increase the need for transfer to General Hospitals.

This study has a number of strengths. The population sample was large and inclusive of all patients admitted to NHS psychiatric inpatient units in a defined area, serving 1.2 million people over a 1-year study period. The mental health provider studied is a near-monopoly provider for its geographic catchment; hence these data should be representative of patients admitted to psychiatric facilities. In contrast to many other nations, the majority of mental health care within the UK is provided by state run

services, aiding completeness of the data. Our study thus provides the largest retrospective analysis of general hospital and ED usage by psychiatric inpatients.

Limitations to this study include the finite study period and the use of a single urban geographical setting. We were unable to access data on patients admitted to psychiatric inpatient settings in different geographical regions. Also, the data only included NHS bed occupancy and excluded private mental health hospital beds (bought for NHS patients when NHS beds are full). We have no reason to believe that rates of medical co-morbidity would be different in those NHS patients placed within the private sector for bed occupancy reasons. A small proportion of local patients in the boroughs served by SLAM choose private mental health inpatient care, either self- or insurance-funded. It is speculative as to whether this would have affected our findings: it is possible that those patients who self-fund their private psychiatric healthcare may have better than average physical health by virtue of their higher socio-economic status; however it is likely that the numbers in self-funded inpatient care would be too small to have influenced these figures.

Another potential problem is the use of HES diagnoses. By the very size of the large population coded, questions will arise about the reliability of diagnostic coding across different centres. However, a recent systematic review comparing HES data with medical case notes concluded that collected data are sufficiently robust to support their use for research [24]. A further limitation is that as classification systems group similar diagnoses together for the purpose of comparison, clinical detail may be lost in the coding process.

We have defined a general hospital admission on HES as an admission to a hospital where the provider does not also submit a mental health minimum data set (MHMDS) return. All major mental health providers, even if linked to a general hospital, submit to MHMDS. However it is theoretically possible that 'mixed providers' may exist; If that is the case then our figures would be underestimates.

These high rates of hospitalisation reinforce the pressing need to better integrate medical care provided to psychiatric inpatients. This area has not been widely studied [15, 25], with most research into integrated medical and psychiatric care to improve physical health outcomes occurring in community settings [26].

A general hospital admission while acutely mentally ill is likely to disrupt treatment for the mental illness - moving from one hospital setting to another, transferring care to different clinicians - with potential for distress in the patient and their family. Embedded and better integrated medical care in psychiatric inpatient settings would allow effective management of medical presentations within the psychiatric ward at an earlier stage, and be likely to reduce the need for ED attendance and /or general hospital admissions. Such approaches may also lessen the economic burden, by providing comprehensive and integrated care in the setting most suited to the patients' needs. Such services should be evaluated for their cost-effectiveness and clinical outcomes.

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