# **Variation in clinical care associated with weekend admission and discharge in psychiatric inpatient units.**

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## **ABSTRACT**

**BACKGROUND**: Questions have been raised regarding differences in the standards of care that patients receive when they are admitted to or discharged from inpatient units at weekends.

**AIMS**:

To compare the quality of care received by service users with anxiety and depressive disorders who were admitted to or discharged from psychiatric hospital at weekends, with those admitted or discharged during the ‘working week’.

**METHOD**: Retrospective case-note review of 3795 admissions to inpatient psychiatric wards in England. Quality of care received by people with depressive or anxiety disorders was compared using multivariable regression analyses.

**RESULTS**: 795 (20.9%) service users were admitted at weekends, and 157 (4.8%) were discharged at weekends. There were minimal differences in quality of care between service users admitted at weekends and those admitted during the week. Service users discharged at weekends were less likely to be given sufficient prior notification (48 hours) in advance of being discharged (OR= 0.55, 95% CI 0.39 to 0.78), to have a crisis plan in place (OR= 0.65, 95% CI 0.46 to 0.92), or to be given medication to take home (OR= 0.45, 95% CI 0.30 to 0.66). They were also less likely to have been assessed with a validated outcome measure (OR=0.70, 95% CI 0.50 to 0.97).

**CONCLUSION**: There is no evidence of a ‘weekend effect’ for service users admitted to psychiatric hospital at weekends, but the quality of care offered to service users who were discharged at weekends was relatively poor, highlighting the need for improvement in this area.

## **INTRODUCTION**

Concerns have been raised that the quality of inpatient care that people receive may vary according to the day of the week.1 Clinical outcomes may be worse among service users who are admitted to2–7 and discharged from8 acute hospitals at the weekend compared to those admitted and discharged during the ‘working week’.

Reasons for this ‘weekend effect’ are unclear. While it has been suggested that increased mortality may be the result of lower staffing levels, or poorer access to pathology, radiology and other services, others have noted that that the ‘threshold’ for hospital admission may be higher at weekends and argued that poorer outcomes among those admitted during the weekend may be because their health problems are more severe.9 However, a recent meta-analysis found evidence of a ‘weekend effect’ even after accounting for severity of disease.10

Studies to date have largely examined general hospitals providing acute medical, surgical and obstetric care: little research has been carried out in mental health hospitals, where there are over 100,000 inpatient admissions per year in England alone.11 The lack of research in this area is concerning, particularly as the periods immediately following admission and discharge have been identified as high-risk windows for adverse incidents in psychiatric inpatient units.12,13

One of the few studies of mental health services investigated mortality due to suicide, and found a ‘reverse’ weekend effect, whereby inpatients who died by suicide during an admission were less likely to have been admitted at the weekend.14 However suicide during admission is a rare event, and there are limitations to using this measure to evaluate quality of care.15 Another study reported shorter lengths of stay among those admitted at weekends16 but this was conducted within a single organisation, and the impact of weekend admission and discharge across a range of services has not been explored.

We therefore aimed to investigate whether weekend admission or discharge from psychiatric hospital was associated with worse clinical care for a specific patient cohort (those diagnosed with depressive illness, anxiety or stress-related disorders), using primary outcome measures based on NICE guidance for inpatient services17-19 and the Royal College of Psychiatrists’ ‘Standards for Inpatient Mental Health Services’.20

## **METHODS**

### **Setting and Participants**

Data were obtained from the National Clinical Audit of Anxiety and Depression (NCAAD) carried out by the Royal College of Psychiatrists (RCPsych) in England in 2017-2018. The methodology for the audit has already been published and is available online.21 All inpatient mental health facilities in England which receive funding from the NHS and provide services to adult service users diagnosed with anxiety and/or depressive disorders (54 Trusts in total) were asked to take part. Restricting the sample to service users with anxiety and depressive disorders reduced the impact of a potential confounder, in that service users admitted or discharged on weekends and weekdays may have different clinical characteristics.

All services which took part in the audit were asked to supply an anonymous register of eligible service users who had been admitted to hospital during a sampling period from 1st April 2017 to 30th September 2017. If a service user had been admitted to hospital more than once during this sampling period, only the first admission was examined for the audit.

Service users were considered eligible for inclusion if they fulfilled the following criteria:

* Age ≥ 16 years
* Recorded primary diagnosis of either an anxiety or a depressive disorder (as per ICD-10) at the point of discharge.

Service users were excluded if they had been given a primary diagnosis of bipolar affective disorder, cyclothymia, mania or any psychotic disorder during the admission. Service users who went on to be admitted to forensic or long-stay (e.g. rehab) wards were also excluded.

If a service’s register included >100 eligible cases, the RCPsych audit team selected 100 of these at random for inclusion in the audit.

### **Data Collection**

All organisations which had been invited to participate (representing services provided by 54 NHS Trusts) submitted data for the audit. Staff from the audit department of each organisation were asked to review the case notes for each of their eligible service users and complete an online data collection tool, using data from clinical records only. For each organisation, 5 of the sampled cases were selected at random for dual auditing (the tool was completed twice independently by separate auditors). For these cases, the two corresponding sets of results were then specifically examined by the RCPsych team to determine inter-rater reliability. Levels of inter-rater agreement were generally high, with 30% of items having complete agreement, 39% having substantial agreement and 31% having moderate to low agreement. In addition, three organisations were randomly selected for a quality assurance process which involved the RCPsych team visiting, auditing a random selection of cases directly, and comparing these to the data that had been submitted – thereby ensuring that the results which had been submitted were accurate.

The audit tool was designed using guidance for inpatient services produced by NICE17-19 as well as ‘Standards for Inpatient Mental Health Services’ produced by the RCPsych College Centre for Quality Improvement20. It was formulated using input from psychiatric service providers, and public, patient and carer involvement groups. It included items examining service user demographics, characteristics of admission (time and date of admission and discharge), assessment (including physical health assessment), care planning, medication management, psychological therapies, crisis planning, discharge, follow-up and re-admission. Before commencing the main audit, six volunteer Trusts were enlisted in a pilot programme and completed an abbreviated version of the audit. The tool was refined further with their feedback in order to guarantee that the audit process was easy to understand and practically achievable with the supporting information available.

The National Research Ethics Service and the Ethics and Confidentiality Committee of the National Information Governance Board were consulted, and recommended that the project could be completed without formal ethical approval/ written consent from participants because of the project’s status as an audit (rather than a research project), and because service user identifiable data were not being recorded. All procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

### **Exposure, outcome measures and covariates**

‘Weekend admission’ was defined as being admitted to hospital between 00:00 and 23:59 on a Saturday, Sunday, or UK public holiday. ‘Weekend discharge’ was defined as whether the end of a hospital admission took place within that same timeframe. The primary outcome measures were 23 items on quality of clinical care, based on national guidelines17-19,22 and ‘Standards for Inservice user Mental Health Services’ as defined by the RCPsych College Centre for Quality Improvement.20

These were:

1. Did the (initial) assessment include details about the service user’s past response to treatment?
2. Did the (initial) assessment consider whether the service user had a history of trauma?
3. Was there a documented current BMI?
4. Was there a documented current smoking status?
5. Was the identified family member, friend or carer provided with information about available support services and/or a support plan? (where an appropriate family member, friend or carer had been identified)
6. Was the identified family member, friend or carer offered a carer’s assessment? (where an appropriate family member, friend or carer had been identified)
7. Did the service user have a care plan?
8. Is there evidence that the care plan was jointly developed between the service user and clinician?
9. Was the service user given a copy of their care plan?
10. Was the service user referred to psychological therapy?
11. Was the service user given at least 24 hours’ notice of discharge?
12. Was the identified family member, friend or carer given at least 24 hours’ notice of discharge? (where an appropriate family member, friend or carer had been identified)
13. Was the service user being prescribed psychotropic medication at the point of discharge?
14. Was the service user given verbal and/ or written information about their medication prior to discharge?
15. Did a review of the service user’s medication(s) take place prior to discharge?
16. At discharge, was the service user given ‘to take home’ (TTO) medication?
17. Did the service user have a crisis plan at the point of discharge?
18. Was a discharge letter sent to the service user’s GP within 24 hours?
19. Was a care plan sent to a nominated person in an accepting service? (where an appropriate service had been identified)
20. Did the service user receive follow-up within 48 hours of discharge?
21. Did a review of the service user’s medication(s) take place between discharge and the end of the audit period?
22. Was an appropriately validated outcome measure completed?
23. Was the service user re-admitted to hospital between discharge and the end of the audit period?

Covariates were also recorded – primary and secondary diagnoses, age, gender, ethnicity, employment status, accommodation status, wait time for bed, length of admission and detention status (whether admitted subject to restrictions imposed under the UK Mental Health Act 1983). The audit tool has been published online at: https://www.rcpsych.ac.uk/improving-care/ccqi/national-clinical-audits/national-clinical-audit-of-anxiety-and-depression/resources-for-core-audit.

### **Statistical Methods**

We used SPSS23 to analyse study data. Initially, we calculated the proportion of service users who were admitted on each day of the week, and divided these into ‘weekend admissions’ and ‘weekday admissions’. This was repeated for discharges. Using univariate logistic regression, we examined the association of covariates (primary/ secondary diagnosis, age, gender, ethnicity, employment/ accommodation status, mode of admission) with weekend admission. We then used binomial logistic regression to examine the association of weekend admission with each primary outcome measure. This process was repeated for discharges, omitting two items which related only to initial assessment, as these were not judged to be relevant for weekend discharges.

As service users were clustered by service, (ie quality of care for service users treated at the same service may be more similar compared to those treated at other service) all analyses were adjusted using multilevel logistic regression. Initially, the association between weekend admission/ discharge and each quality of care variable was examined without accounting for any confounding variables. We them performed each analysis again, adjusting for the effects of service-level variation as well as any other variables which had been found to be significantly associated with the primary outcome measure (eg patient demographics such as age, gender etc).

## **RESULTS**

54 NHS Trusts participated in the audit, examining the case notes for 3795 service users in total. A total of 795 (20.9%) of admissions took place at weekends (including bank holidays), and 157 (4.8%) of discharges were at weekends (Figure 1).

Tables 1 and 2 (supplementary material) compare the demographic and clinical characteristics of service users who were admitted and discharged at weekends with those of service users admitted and discharged during the working week. Service users below the age of 18 were less likely than all other age groups to be admitted at weekends; homeless service users were more likely to be admitted and discharged at weekends.

Neither weekend admission nor discharge were associated with particular primary or secondary diagnoses. Univariate analysis indicated an association between weekend admission and employment status (those admitted at weekends had shorter admissions than those admitted during the week) but there was no evidence for these effects after adjustment for other factors.

Figure 2 (and table 3 – supplementary material) show the results of multivariate regression analyses - displaying the effect of weekend admission on the primary outcome measures. There were few differences in these measures between service users admitted during weekends and those admitted during the week. Service users who were admitted at weekends were less likely to receive a medication review during their admission (OR=0.71, 95% CI 0.56 to 0.91, P=0.005), but there were no significant differences between groups in any of the other outcome measures. Univariate analysis suggested that service users admitted at weekends were less likely to be provided with medication to take home following discharge, but this association did not persist after adjustment for demographic and clinical factors.

Figure 3 (and table 4 – supplementary material) summarises the multivariate regression analyses investigating the association between weekend discharge and the primary outcome measures. Service users who were discharged at weekends were less likely to have received sufficient (at least 48 hours) prior notification before being discharged (OR = 0.55, 95% CI 0.39 to 0.78, P=0.001), less likely to have had a crisis plan in place at discharge (OR = 0.65, 95% CI 0.46 to 0.92, P=0.014), and less likely to have been prescribed medication to take home with them (OR=0.45, 95% CI 0.30 to 0.66, P<0.0001). Service users discharged at weekends were also less likely to have been assessed with a validated outcome measure (OR = 0.70, 95% CI 0.50 to 0.97, P=0.032).

## **DISCUSSION**

Data from this study corroborate previous findings that patient turnover in psychiatric hospitals is reduced during weekends.16 Discharges are particularly affected with only 4.7% taking place at weekends, while 19.9% of admissions take place at weekends. These findings demonstrate some variation in practice over the course of the week.

Young people aged 16-17 were considerably less likely to be admitted to hospital at weekends, which may reflect a deliberate strategy to avoid admissions at weekends. Homeless service users were more likely to be admitted and discharged from psychiatric hospital at weekends, suggesting that mechanisms designed to prevent patient turnover at weekends are less effective when service users lack stable accommodation or possibly a consistent point of contact with mental health services. After adjusting for demographic and clinical characteristics, we did not replicate a previous finding16 that female and ethnic minority service users were more likely to be admitted at weekends, or that compulsory admission was less frequent at weekends. We also found no evidence that service users with specific diagnoses were more likely to be admitted or discharged on a weekend.

We found minimal variation in quality of care between service users admitted at weekends and those admitted during the working week. By contrast, there was clear evidence for diminished quality of care among service users who were discharged at weekends. Aspects that differed related largely to the discharge planning process: service users discharged at weekends were less likely to have received sufficient prior notification before being discharged, to have had a crisis plan in place at the point of their discharge, and to have been prescribed medication to take away at the point of discharge.

### **Strengths and limitations**

A large sample was obtained, encompassing data from services providing acute psychiatric inpatient care in every NHS Trust across England. We anticipate, therefore, that the sample is representative of the target population, and that the findings are generalisable to wider clinical practice relating to service users with anxiety and depressive disorders.

Prior to this investigation, the most comprehensive consideration of the ‘weekend effect’ in psychiatric services 16 was restricted to a single NHS trust, and used relatively rare serious events (inpatient mortality and violent incidents) to examine potential differences in care. By contrast, the primary outcome measures we used were based on NICE guidance17-19 and RCPsych standards20 , developed with input from an advisory group of providers, patient and carer representatives.

There are significant limitations. A retrospective case note audit is dependent upon accurate clinical records, which may fail to fully capture service user/carer experiences. By restricting the study to service users with diagnoses of anxiety and depressive disorders, we addressed a potential confounding effect identified in previous studies14,16 but the findings may not be generalisable to all people admitted to mental health units, in which the majority of psychiatric admissions relate to people with psychoses.

We were unable to gather information from individual services regarding staffing levels and operating procedures at weekends, as well as availability of community services (eg crisis/ home treatment teams) and housing/ social services. Finally, the cross-sectional design means we are unable to examine and characterise temporal associations between weekend admission/ discharge and standards of care: for example, whilst difficulties with the process of undertaking a discharge at the weekend might lead to poor care standards, equally poor care standards might lead to unplanned discharge during the weekend (eg by service user self-discharging).

### **Implications**

Strategies employed by the NHS in general hospitals to reduce or eliminate the weekend effect have focussed on improving staffing levels, as reduced weekend staffing has been repeatedly highlighted as a major contributory factor, despite limited evidence.24 Mental health services also tend to operate with reduced scheduled activity and lower staffing at weekends, including limited input from senior clinicians. Our findings provide little evidence for variation in quality of care for patients admitted to psychiatric hospitals at weekends. In this study, the absence of weekend variation relating to *admission* in this study may reflect that fact that some of the other possible causes of the ‘weekend effect’ in general hospitals- such as lack of access to specialist equipment or investigations25 - are less applicable to mental health settings.

We found some evidence that quality of care was worse for service users who were *discharged* from psychiatric hospital at weekends. A small minority of discharges took place at weekends, and it is hard to know whether quality of care was affected because of inherent difficulties with the discharge process at weekends (such as lack of access to pharmacy services, absence of input from senior clinicians, and reduced availability of community mental health and social services).

These findings merit further research in order to identify the exact reasons for the relatively poor quality of care for weekend discharges. Discharge planning is a crucial stage of any hospital admission, and a poorly planned or executed discharge may undermine the efficacy of a period of inpatient treatment. Research with service users has found that discharge is often experienced as chaotic and distressing,26 and rates of adverse incidents such as self-harm and suicide are particularly high in the period immediately following discharge from psychiatric hospital.27,28 Unplanned discharge has been associated with greater risk of suicide,29 while discharge planning interventions have been shown to be effective in improving outcomes including reducing rehospitalisation and improving adherence to aftercare.30

While we did not find differences in the quality of care of service users admitted to mental health units during the working week and at weekends, it is important to note that the quality of care that service users received (regardless of when they were admitted) fell short of national standards. As an example, <60% of service users had been followed up 48 hours after discharge, or had a discharge letter sent to their GP 24 hours after discharge, while <30% of carers were offered an assessment of their needs. These findings will be addressed in the NCAAD core audit report, suggested as potential targets for quality improvement activities by the RCPsych, and re-examined in future cycles of the national audit.

### **Conclusions**

We found minimal evidence for differences in quality of care between those admitted during weekends and those admitted during the week, but substantial evidence for differences in care between those discharged at the weekend and those discharged during the week. This association merits further research into the processes underlying weekend discharge in order to improve the effectiveness of in care.

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## **Declaration of Interest:**

LF and DB each received a consultancy fee (payable to the Universities of East London and Southampton respectively) from the RCPsych for their input to the NCAAD.

## **Funding:**

RW is supported by a UK National Institute for Health Research (NIHR) Academic Clinical Fellowship. The Imperial Biomedical Research Centre Facility which is also funded by the NIHR provided support for this project. The NCAAD was funded by the Royal College of Psychiatrists in conjunction with the McPin Foundation – an independent mental health research charity. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR, RCPsych or the Department of Health. The funders had no role in the design or conduct of the study; collection, management, analysis or interpretation of the data; preparation, review or approval of the manuscript; or decision to submit the manuscript for publishing.

## **Acknowledgements:**

The authors would like to thank all members of the NCAAD team at the Royal College of Psychiatrists for their support with this study.

## **Author Contribution:**

MC and RW formulated the presented research question and designed the study. MC supervised the work, RW performed the statistical analysis, drafted the manuscript and designed the figures. ER, NL, LF, AQ and DB were involved in gathering and processing the NCAAD data and commented on drafts of the manuscript.

## **Data Availability:**

All authors had access to the full study dataset. The dataset is held by the NCAAD team at the RCPsych Centre for Quality Improvement and could be made available on request.