The provision of seven day multidisciplinary staffing in Scottish acute medical units: a cross-sectional study.

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TITLE PAGE

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ABSTRACT

Background

Acute medical units (AMUs) are a central component of the admission pathway for the majority of medical patients presenting to hospital in the United Kingdom (UK) and other international settings. Detail on multidisciplinary staffing provision on weekdays and weekends is lacking. Equity of staffing across seven days is a strategic priority for national health services in the UK.

Aim

To evaluate weekday compared with weekend multidisciplinary staffing in a national set of AMUs.

Design

Cross-sectional survey.

Methods

Twenty-nine Scottish AMUs were identified and all were included in the study population. Data were collected by semi-structured interviews with nursing, pharmacy, therapy, non-consultant medical and consultant staff.

Staffing was quantified in staff hours. A correction factor of 0.5 was applied to non-dedicated staff. The percentage of weekend/weekday staffing was calculated for each unit and the mean of these percentages was calculated to give a summary measure for each professional group.

Results

As a percentage of weekday staffing levels, weekend staffing across the units was 93.8% for nursing staff; 2.2% for pharmacy staff; 13.1% for therapy staff; 69.6% for non-consultant staff and 65.0% for consultant staff.

Conclusions

There is a contrast between weekday and weekend staffing on the AMU, with reductions at weekends in total staff hours, the proportion of dedicated versus undedicated staff and the seniority of nursing staff. The weekday/weekend difference was far more pronounced for allied healthcare professional staff than any other group. These findings have potential implications for patient outcomes, quality of care, hospital flow and workforce planning.

INTRODUCTION

Acute medical units (AMUs) are a central component of the admission pathway for the majority of acute medical patients presenting to hospital in the United Kingdom (UK). This is increasingly the case in other international settings, including Ireland[1], Australasia[2,3], and some parts of Europe[4-6]. AMUs developed organically in the UK in the 1990s in response to criticism that the traditional model of admitting medical patients to multiple medical wards was not fit for purpose. The AMU model is still in evolution, and a detailed understanding of staffing provision is lacking. A fundamental component of quality healthcare provision is the availability of a workforce to deliver that care[7,8]. In addition, the equity of staffing across all seven days of the week is a strategic priority for the National Health Services (NHSs) in the UK[9]. Therefore, this study evaluated multidisciplinary staffing, including nursing, clinical pharmacy, therapy and medical staff, in a national set of AMUs in Scotland with the aim of comparing weekday and weekend staffing levels.

METHODS

Study design

A cross-sectional survey based upon interviews conducted during a two day visit to each AMU was undertaken.

Sample and setting

The aim of this study was to evaluate a national set of AMUs; this determined the sample size. AMUs were identified by a review of the services offered in each Scottish hospital through discussions with clinicians working in acute medicine in Scotland, government representatives and content experts. This information was cross-checked with information held by Information Services Division (ISD) Scotland. ISD is part of National Services Scotland, which is an NHS Scotland board that provides data, statistical and healthcare intelligence support. Through this process we identified 29 AMUs in Scotland. **Study period**

The study period was from 29th January 2014 to 20th February 2015.

Recruitment and participants

Representatives from each AMU were identified from participants of an acute medicine working group based at the Royal College of Physicians of Edinburgh. These representatives coordinated the research visits and identified and recruited interview participants. Interview participants were individuals fulfilling specific healthcare professional (HCP) roles: nursing, clinical pharmacy, occupational therapy (OT), physiotherapy (PT), non-consultant medical staff and consultant medical staff.

Data collection

Data were collected by semi-structured interviews. Written consent was obtained from each participant prior to the interview. The number of interviewees participating in each interview ranged from one to four. All interviews were conducted in accordance with Good Clinical Practice[10,11] by the same researcher. Interviews with nursing, non-consultant medical and consultant staff were audio-recorded with consent. Detailed field notes were taken during each interview. The interview topic guides are given in Supplementary Table 1. These were developed iteratively during three pilot visits undertaken prior to commencing formal data collection. Data were recorded in the form of a report that was generated for each unit from the field notes taken during the interviews.

Data verification

A draft report was returned to the representative in each AMU for verification prior to being finalised.

Data analysis

Summary of staff hours for each HCP group

Definitions relating to the analysis of the different HCP groups are given in Supplementary Table 2. These are based on a combination of accepted definitions where possible and the most common working patterns across the units.

Weekdays were defined as Monday to Friday and weekends were defined as Saturdays and Sundays. Where care varied between weekdays, a 'typical' day was charted, based on the staffing for the majority of the weekdays. In units where care differed between a Saturday and a Sunday, Saturdays were charted. When a range of staff numbers was reported, the lower number was charted (for example, if it was stated that the staffing comprised two to three registered nurses, then two were charted).

Staff were stratified as being either dedicated or non-dedicated. Dedicated was defined as only having responsibilities in the AMU; non-dedicated was defined as having responsibilities in other hospital areas in addition to the AMU. Responsibilities outside the AMU were defined as those involving the regular delivery of care in areas such as clinics, wards or high dependency units. With the exception of the non-consultant medical group, dedicated versus non-dedicated was applied at the level of the service for all HCP groups. That is, if any of the practitioners had responsibilities outside the AMU then the whole service was classified as non-dedicated. In the non-consultant analysis, individual clinicians were stratified as dedicated/non-dedicated. It was not possible to accurately estimate the amount of time non-dedicated staff spent in the AMU for each individual unit given the multiple factors that influence this. Therefore, a standard correction factor of 0.5 was applied to non-dedicated staff in the main analysis. This equates to these staff members working in the AMU for 50% of their time.

To further investigate nurse staffing, we also examined the presence of a supernumerary nurse in charge during the week and at the weekend. A supernumerary nurse in charge was defined as those who were not included in the fixed number required to deliver direct patient care and who had a role in overseeing and coordinating the care delivered within the AMU (as per Society for Acute Medicine standard)[12].

Comparison of weekend to weekday staffing

Weekend staffing was calculated as a percentage of weekday staffing for each HCP group in each unit. The mean of these percentages across the units was calculated to give a summary measure for each HCP group. This approach was taken in order to reflect the services at unit level rather than cumulatively at national level, given that each unit functioned as a separate entity. The reduced presence of non-dedicated staff compared to dedicated staff in the AMU was also taken into account in this analysis by applying the correction factor of 0.5.

Sensitivity analysis

Given that different HCP groups have different proportions of dedicated and non-dedicated staff, a sensitivity analysis was performed in the analysis comparing weekend to weekday staff using a range of correction factors (from 0.25 to 1 in 0.25 increments). This equated to non-dedicated staff working in the AMU between 25% and 100% of their time.

Ethical considerations

Ethical guidance was sought from the Scientific Officer in the NHS South East Scotland Research Ethics Service, who concluded that this work was service evaluation and therefore did not require NHS Medical Research Ethics approval (reference NR1310AB25). Ethical approval was also sought and granted from the Ethics Committee in Centre of Population Health Sciences at the University of Edinburgh (date of approval 17/03/2014).

RESULTS

Twenty-nine nurses, 36 clinical pharmacists, 34 therapists, 41 non-consultant medical staff and 38 consultant staff were interviewed. Twenty-nine unit reports were generated, all of which were verified by the unit representative.

Summary of weekday and weekend staff hours by HCP group

A summary for the mean total staff hours for each HCP group on weekdays and weekends is given in Table 1.

Nurse staffing (n = 29)

Nurse staff hours for each unit for weekdays and weekends is given in Figure 1. All nursing staff in all units were dedicated to the AMU at all times. In 61% of the included AMUs nurse staffing during the day was the same on weekdays and weekends. In all units, nurse staffing overnight was the same on weekdays and weekends.

Seventy-eight per cent of AMUs had a nurse in charge who was supernumerary during the week and 48% of AMUs had a nurse in charge who was supernumerary at the weekend.

Clinical pharmacy staffing (n = 29)

Clinical pharmacy staff hours for each unit for weekdays and weekends is given in Figure 2. There was a weekday clinical pharmacy service in all 29 sites and a weekend clinical pharmacy service in six units (21%). In 12 units (41%) the weekday pharmacy service was dedicated to the AMU and in the remaining units one or more pharmacists had additional responsibilities elsewhere. Three per cent (one unit) had a dedicated service at the weekend.

Therapy staffing (n = 25)

Therapy staff hours for each unit for weekdays and weekends is given in Figure 3. Data were missing for four AMUs due to therapy staff being unavailable to participate in the data collection due to workload. The total number of units included in this analysis is therefore 25.

There was some form of therapy service (PT, OT or both) in all 25 units during the week and in eight units (32%) at the weekend. There was a dedicated AMU therapy service in 41% of AMUs on weekdays and in 8% of AMUs on weekends.

In nine units (35%) there was an integrated therapy service. This involved the initial assessment being undertaken by either a PT or an OT, with any further required assessment/treatment directed to either the OT or the PT as appropriate.

Non-consultant medical staffing (n = 29)

Non-consultant staff hours for each unit for weekdays and weekends is given in Figure 4. The overnight non-consultant medical staffing was the same on weekdays as weekends in 83% of units. However, no unit demonstrated the same day time staffing on weekdays and weekends. Four units (14%) had entirely dedicated staff from 0900 to 1700 on weekdays. No unit had entirely dedicated staff outside of these times.

Seventeen units (59%) had at least one nurse practitioner routinely undertaking a patient assessment role in the acute service. In 82% of these units the nurse practitioners worked at weekends; in none did they work overnight.

Consultant staffing (n = 29)

Consultant staff hours for each unit for weekdays and weekends is given in Figure 5. Consultant staffing was consistent between weekdays and weekends in 8 AMUs (28%). In 12 AMUs (41%) one or more consultants had additional responsibilities outside the AMU during the week. In 90% of AMUs one or more consultants had additional responsibilities at the weekend.

Comparison of weekend to weekday day staffing

Comparisons of weekday to weekend staffing across the HCP groups are given in Figure 6. The mean percentage of weekend to weekday staff hours for nursing staff was 93.8%; for pharmacy staff 2.2%; for therapy staff 13.1%; for non-consultant staff 69.6%; and for consultant staff 65.0%.

Sensitivity analysis

The results of the sensitivity analysis are given in Supplementary Figure 1. Nurse staffing was unaffected by variation in the correction factor. The comparison of weekend to weekday consultant staffing was most sensitive to variation of the correction factor, followed by non-consultant staffing. However, the sensitivity analysis shows that the use of the arbitrary correction factor does not affect the overall findings from the comparisons between the HCP groups: therapy and pharmacy were still the most reduced HCP groups at the weekends compared to the weekdays.

DISCUSSION

In this cross sectional survey of multidisciplinary (MDT) weekday and weekend staffing across a national set of 29 AMUs we have quantified and characterised the difference between weekday and weekend staffing. We have observed reductions in total staff hours across all HCP groups, the proportion of staff who are dedicated to the AMU, and the seniority of nursing staff on weekends compared with weekdays. The weekend reduction was more pronounced in allied healthcare professionals (AHPs) than for any of the other HCP groups.

A strength of this study is the use of robust methodology to collect data across a national set of AMUs and a diverse range of HCPs. The use of a qualitative, semi-structured technique for data collection increased the validity of the findings by allowing flexibility to record the complexity of staffing arrangements across multidisciplinary HCP groups. Furthermore, the internal validity of this work has been increased by the verification of the data in each unit report by the AMU representatives.

This study is limited by the lack of contextualisation of staffing levels to patient demand data. This was due to the unavailability of accurate AMU activity data. Work undertaken by ISD has shown that the quality of the systems currently in use for recording AMU data, and their consistency across sites, is questionable (Harper C, McGregor K; Report from Investigation into the Recording of Activity in Acute Assessment Units across NHS Scotland; NHS National Services Scotland; 2014). We opted not to contextualise findings in terms of number of beds, owing to the lack of data relating to bed occupancy in the AMU: it is possible that the same bed in an AMU is occupied by three to four different patients in one day and occupancy levels are likely to vary between units and between day and night and weekday and weekend. A further limitation is that the dedicated/non-dedicated stratification was applied differently in the non-consultant analysis compared to the other groups. This issue limits the utility of comparing the relative availability of staff across the HCP groups.

However, the methods used for the analysis of weekday staff were consistent to those used for weekend staff for all HCP groups, which is the basis of the main findings. It is also worthy of note that the data presented in this study were collected in 2014/2015. It is possible that staffing has changed since then, especially in light of seven day services being such a topical issue. Finally, although AMUs in Scotland and the other UK nations have a shared lineage and have evolved under similar pressures, health is a devolved power. It is therefore unclear how generalisable the findings of this Scottish study are to the wider UK setting. This will be further informed by similar studies undertaken outside Scotland, such as the one currently underway in NHS England[13]. The relevance of this work to other European and Australasian settings is also unclear.

To our knowledge, this is the first study to compare the weekday/weekend staffing provision across HCP groups in AMUs. The difference in weekday and weekend staffing may be explained by difference in clinical demand on weekdays versus weekends. However, as shown in Supplementary Figure 2, admission data are relatively consistent across the seven days in Scottish hospitals. Although this relates to Emergency Department rather than AMU data, it can be extrapolated to suggest that difference in weekday/weekend demand is unlikely to be the sole reason for the reduction of AMU staff at the weekend. Furthermore, it is unlikely that the marked reduction in AHP services at the weekend is paralleled by a similar reduction in demand.

The differences between weekday and weekend staffing documented in this study have potential implications on quality of care. The evidence relating to staffing in AMUs is limited[14]. However, one large multicentre study conducted in NHS England found an "all-inclusive" consultant work pattern (consistent seven day consultant AMU service with consultants having no additional responsibilities, undertaking two ward rounds a day and working for two or more consecutive days) was associated with a significant reduction in the adjusted case fatality rate of weekend versus weekday admissions (magnitude of difference not given) [15]. Similarly, the introduction of a dedicated OT service on the AMU was associated with earlier OT assessment and a reduction in length of stay[16]; and the development of an enhanced pharmacy service including improved medicine reconciliation and patient counselling was associated with a significant reduction in unintentional drug discrepancies on discharge and increased patient familiarity with their medications[17]. Our findings contextualised with this evidence make a case that current staffing in Scottish AMUs could be developed to optimise patient outcomes, improve hospital flow and provide a more consistent quality service. It is inevitable that adequate AHPs services will become increasingly important with the ageing population on multiple medications and with more prevalent and disabling functional issues. Furthermore, we question if senior nursing staff are less important at weekends than weekdays, especially given that these nurses often have an active role in maintaining patient flow.

This study has implications for future workforce planning. Fundamental to the development of staffing strategies is an understanding of the current state. This is the first evidence-based documentation of AMU staffing and our findings indicate a potential need to change practice: we argue that action is required to develop a consistent fully functional MDT service in AMUs. The fact that the difference between weekend and weekday pharmacy and therapy staffing was far more marked that for the other HCP groups may help direct policy priorities.

Important context to the implication of these findings is the current issues with recruitment and retention of AMU staff[18]. Indeed, it is possible that the current staffing structure may be contributing to these issues. A cornerstone of AMUs is the provision of multidisciplinary care. If these disciplines are inconsistently available then processes of care may differ accordingly. As a result staff will be required to work differently at weekends than during the week, which is an additional burden in an already complex and challenging environment.

In summary, this study has provided evidence indicating inequality in AMU staffing between weekdays and weekends. Ensuring appropriate staffing is an essential requirement to the delivery of quality care and optimal utilisation of resources. Furthermore, the adequacy of staffing may also affect the recruitment and retention of HCPs. The implications of these findings are important given the government's strategic priority of a seven-day NHS and given the central role the AMU plays in the admission process of the vast majority of patients presenting to hospital as a medical emergency.

FUNDING

This study is an output from a programme of research commissioned by a jointly-funded collaboration between the Royal College of Physicians of Edinburgh and the Scottish Government to review acute medical care in Scotland. The Royal College of Physicians of Edinburgh and the Scottish Government contributed to the study design and data collection. The Royal College of Physicians of Edinburgh contributed to the data analysis, interpretation and contextualisation. CJW was supported in this work by NHS Lothian via the Edinburgh Clinical Trials Unit.

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TABLES

Table 1: Mean unit staff hours on weekends and weekdays for each healthcare professional group

Healthcare professional group	Mean total staff hours – weekdays (range)	Mean total staff hours – weekends (range)
Nursing	259.5 (37.5 – 762.5)	237.4 (37.5 – 637.5)
Pharmacy	9.3 (3 – 14)	0.22 (0 – 1.8)
Therapy	13.0 (4 – 36)	3.3 (0 – 18.4)
Non-consultants	91.5 (17 – 266.75)	64.1 (12 – 127.75)
Consultants	17.7 (4 – 44.5)	9.39 (4 – 26.5)

FIGURE LEGENDS

Figure 1: Nurse staff hours in the main AMU per unit, weekdays and weekends.

Solid bars – dedicated staff.

Figure 2: Clinical pharmacy staff hours per AMU, weekdays and weekends.

Solid bar – dedicated staff; interrupted bar – non-dedicated staff.

Figure 3: Therapy staff hours per AMU, weekdays and weekends.

Solid bar – dedicated service; interrupted bar – non-dedicated service.

Figure 4: Non-consultant staff hours per AMU, weekdays and weekends.

Solid bar – dedicated staff; interrupted bar - non-dedicated staff.

Figure 5: Consultant staff hours per AMU, weekdays and weekends.

Solid bar – dedicated staff; interrupted bar non-dedicated staff.

Figure 6: Mean percentage of weekend to weekday staffing by healthcare professional group across units (0.5 correction factor applied to non-dedicated staff).

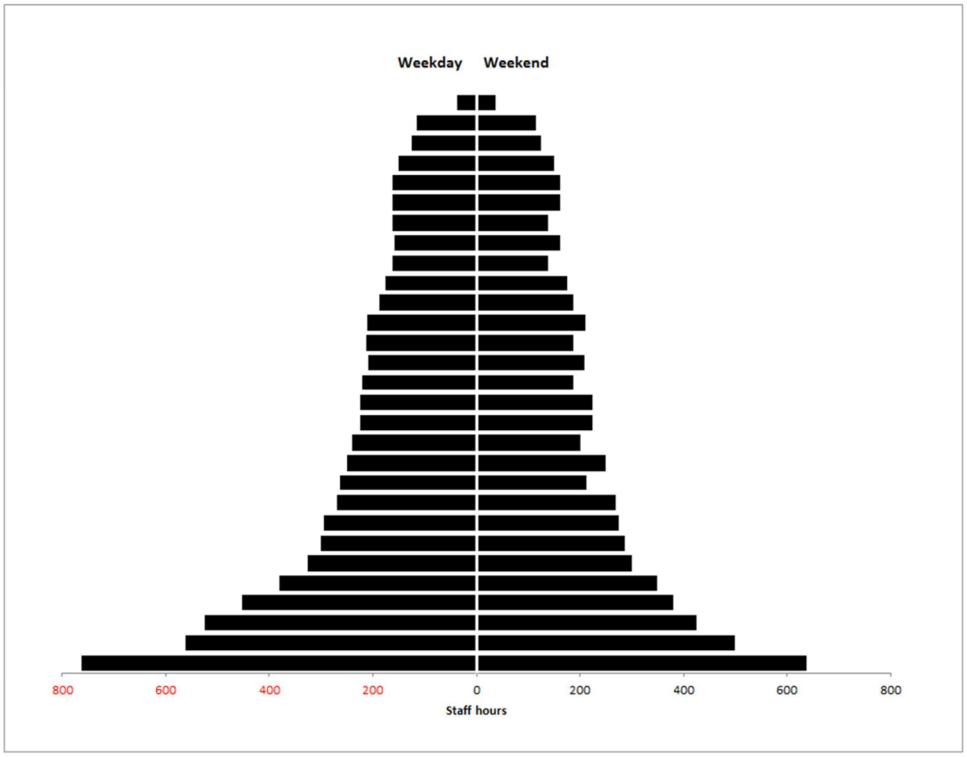

Figure 1: Nurse staff hours in the main AMU per unit, weekdays and weekends. Solid bars – dedicated staff.

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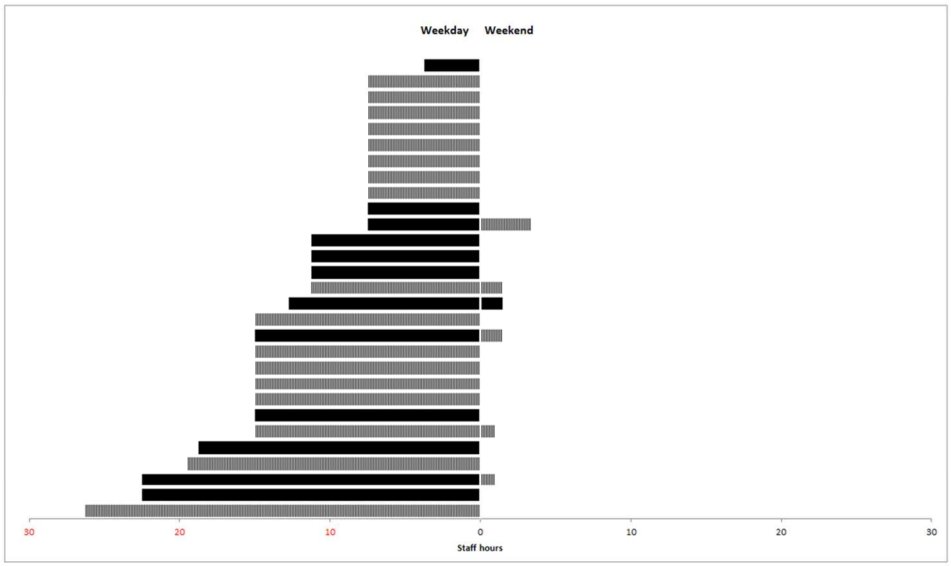

Figure 2: Clinical pharmacy staff hours per AMU, weekdays and weekends.
Solid bar – dedicated staff; interrupted bar – non-dedicated staff.

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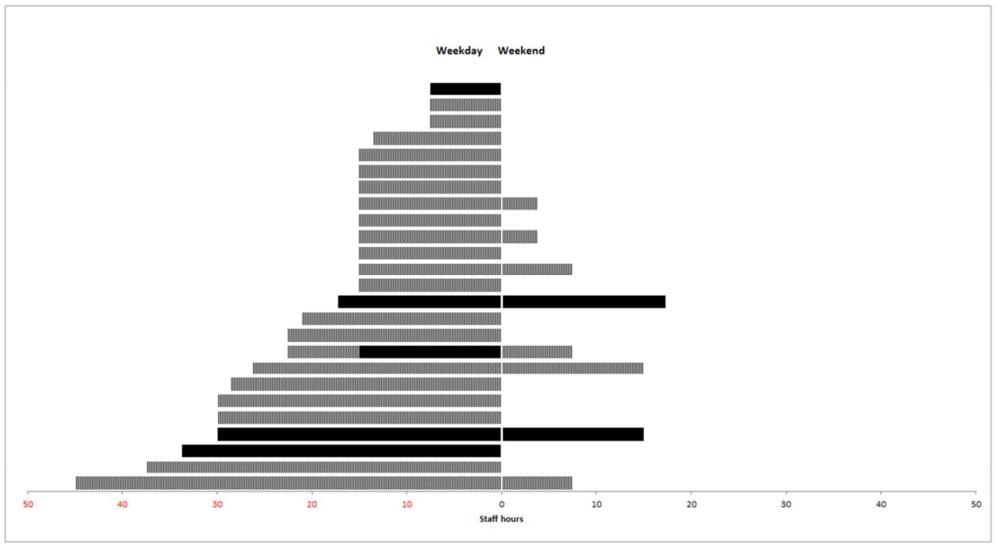

Figure 3: Therapy staff hours per AMU, weekdays and weekends.
Solid bar – dedicated service; interrupted bar – non-dedicated service.

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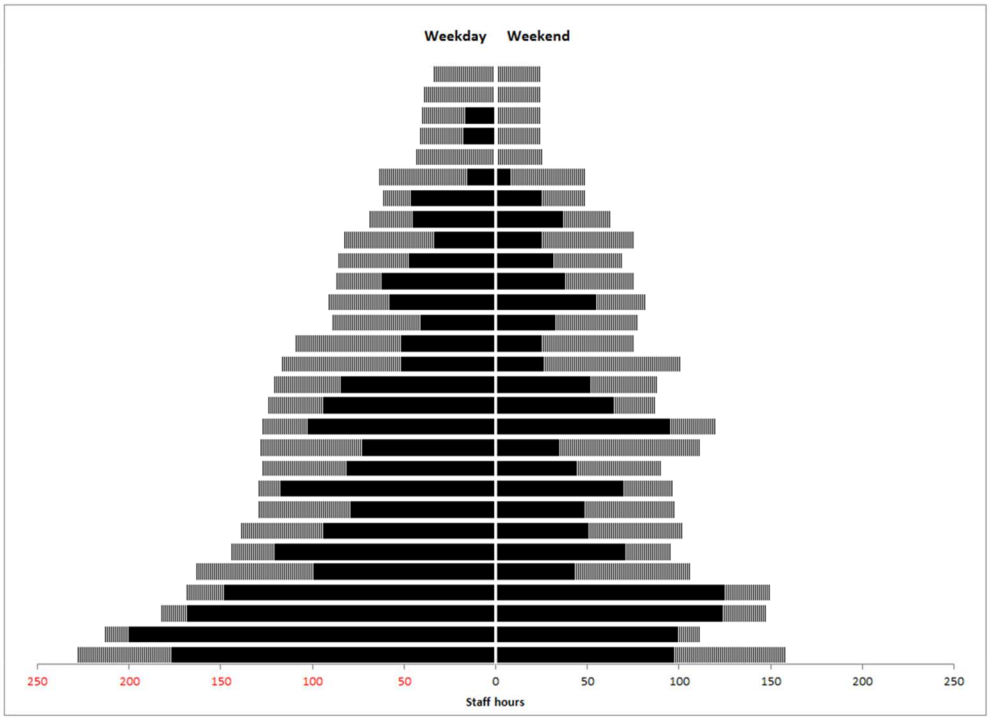

Figure 4: Non-consultant staff hours per AMU, weekdays and weekends.
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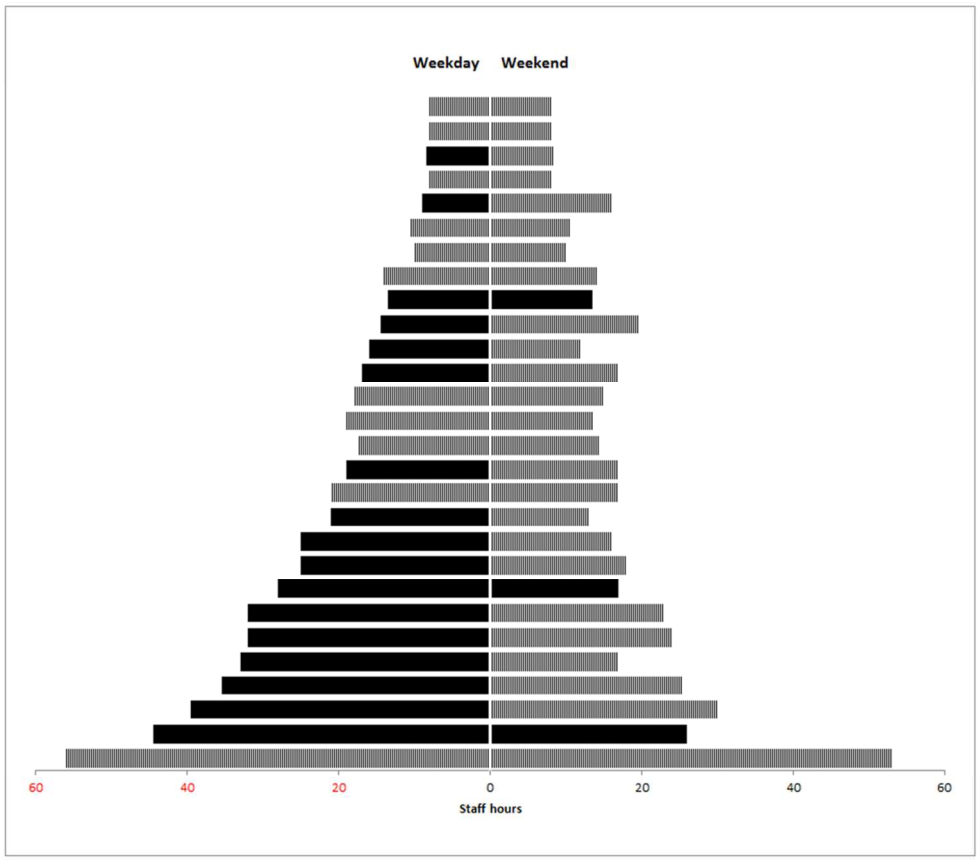

Figure 5: Consultant staff hours per AMU, weekdays and weekends.
Solid bar – dedicated staff; interrupted bar non-dedicated staff.

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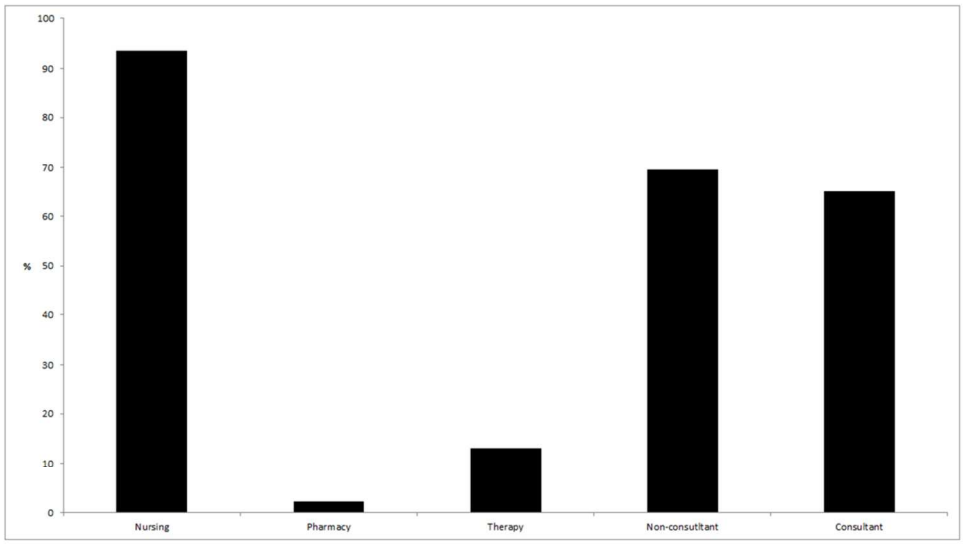

Figure 6: Mean percentage of weekend to weekday staffing by healthcare professional group across units (0.5 correction factor applied to non-dedicated staff).

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Supplementary Table 1: Interview topic guide

AMU – acute medical unit.

Topic	Subtopics
Nurse staffing	Staff hours (weekday/weekend/overnight, unregistered/registered/nurse in charge). Role and responsibilities. Commitments outside the AMU.
Clinical pharmacy staffing	Staff hours (weekday/weekend). Role and responsibilities. Commitments outside the AMU.
Therapy staffing	Staff hours (weekday/weekend, physiotherapy and occupational therapy). Role and responsibilities. Commitments outside the AMU.
Non-consultant medical staffing	Staff hours (weekday/weekend/overnight, all grades). Role and responsibilities. Commitments outside the AMU.
Consultant medical staffing	Staff hours (weekday/weekend/overnight). Role and responsibilities. Commitments outside the AMU.

Supplementary Table 2: Detail of analysis by healthcare professional group

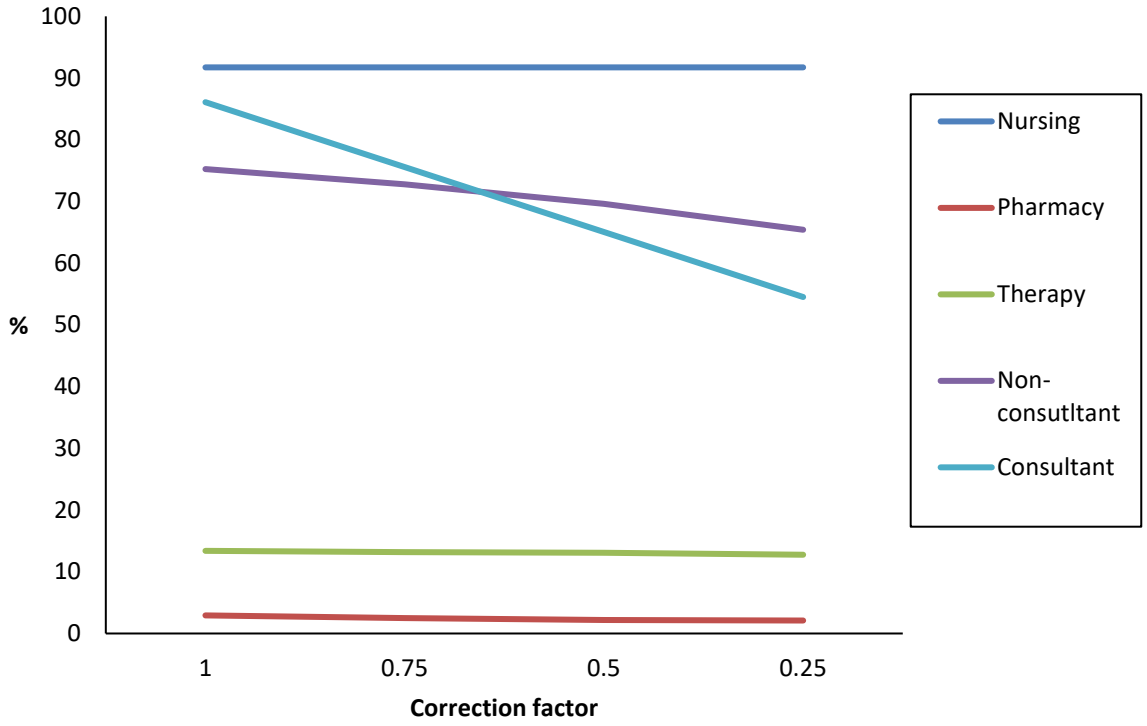
HCP – healthcare professional group; AMU – acute medical unit.

HCP group	Definition	Other notes
Nursing	• Those fulfilling a nursing role on the AMU (nurses undertaking a patient assessment role[1] were included in the non-consultant medical staff). • Day time nurse staffing was defined as being from 0730 to 2000 and overnight staffing from 1930 to 0800.	
Clinical pharmacy	• Those providing direct pharmacy patient care such as reviewing patient medications, counselling patients and attending medical ward rounds as in keeping with the Clinical Pharmacy Association guidance(1).	-
Therapy	• Those working as either a physiotherapist or occupational therapist on the AMU.	-
Non-consultant staffing	• Those undertaking a patient assessment[1] role but who were not consultants. • Daytime staffing was defined as from 0900 to 2200 and overnight from 2200 to 0900.	-
Consultant staffing	• Those undertaking a patient assessment[1] role at consultant level who provide routine core medical care on the AMU. Routine core medical care was defined as care provided regularly and irrespective to changes in the specialty mix. • Consultant presence was defined as being when a consultant was physically present, providing direct clinical care on the AMU. Times when a consultant had responsibility for the AMU but was not physically present were excluded. For example, a consultant may have clinical responsibility for the AMU for a 24-hour period from 0800 one day until 0800 the following day but is only physically present and delivering care in the	• A ward round was designated four hours unless otherwise stated in the reports, in alignment with recommendations by the Royal College of Physicians(2). • The activity of "returning" consultants was excluded. Returning consultants were defined as consultants who retained responsibility for the patients they admitted during their on-call period, who "returned" to review those patients, despite their official session on the AMU having finished. For example, a consultant on duty in the AMU on a Monday would still have responsibility for any patients they had admitted who were still in the AMU on Thursday and Friday. These consultants would "return" to care for these patients. This activity was discounted

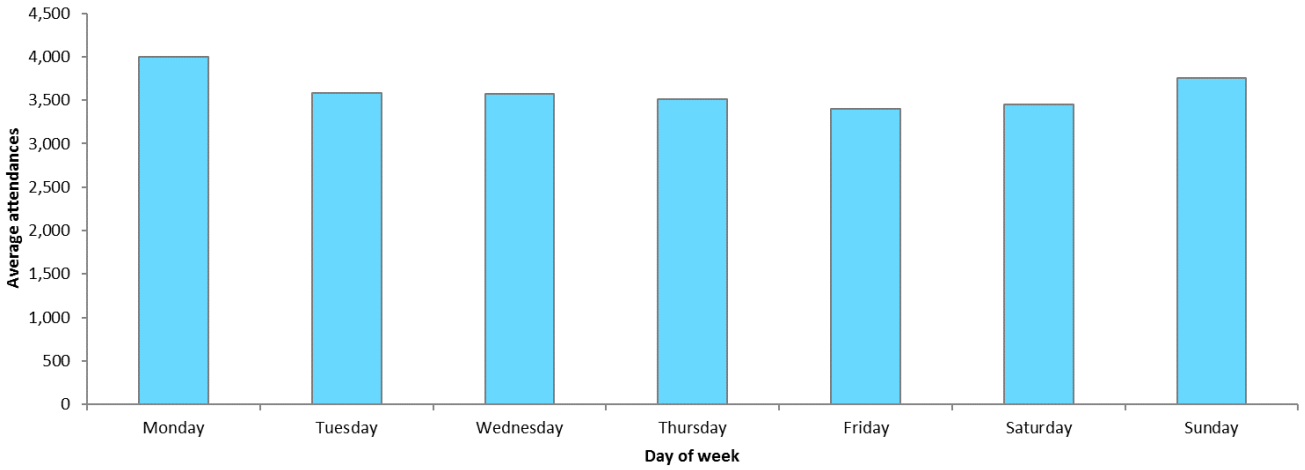
	AMU between 1800 and 2000. In this instance from 1800 to 2000 would be charted as consultant presence.	owing to the difficulty in accurately quantifying it. The reported data is therefore an under representation of consultant activity.

[1]Patient assessment role refers to activities that relate to the diagnosis and treatment of illness that are traditionally undertaken by doctors and are separate to the activities of patient care traditionally undertaken by nursing staff.

Supplementary Figure 1: Sensitivity analysis of comparisons of weekday to weekend staffing across healthcare professional groups using differing correction factors



Supplementary Figure 2 – Emergency department average attendances in Scottish hospitals by day of week, year ending 31 March 2016(3).



References

1. Ahmed SI, Hasan SS, Hassali MA. Clinical pharmacy and pharmaceutical care: a need to homogenize the concepts. *Am J Pharm Educ* 2010;74(10):193g.

2. Royal College of Physicians. Acute care toolkit 4 : Delivering a 12-hour, 7-day consultant presence on the acute medical unit. 2012. https://www.rcplondon.ac.uk/guidelines-policy/acute-care-toolkit-4-delivering-12-hour-7-day-consultant-presence-acute-medical-unit (20 October 2017, daye last accessed).

3. Information Services Division Scotland Emergency Care Activity - When do patients attend Emergency Departments? 2016 http://www.isdscotland.org/Health-Topics/Emergency-Care/Emergency-Department-Activity/Statistics/ (20 October 2017, daye last accessed).

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
Methods			
Study design	4	Present key elements of study design early in the paper	3
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	3
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	3
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	3
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	3
Bias	9	Describe any efforts to address potential sources of bias	4
Study size	10	Explain how the study size was arrived at	3
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	4 and Supp. Table 2
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	n/a
		(*b*) Describe any methods used to examine subgroups and interactions	n/a
		(*c*) Explain how missing data were addressed	n/a
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	n/a

		(*e*) Describe any sensitivity analyses	5
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	5
		(b) Give reasons for non-participation at each stage	5
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	5
		(b) Indicate number of participants with missing data for each variable of interest	5
Outcome data	15*	Report numbers of outcome events or summary measures	6
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n/a
		(*b*) Report category boundaries when continuous variables were categorized	n/a
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	6
Discussion			
Key results	18	Summarise key results with reference to study objectives	6
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	6-7
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	7
Generalisability	21	Discuss the generalisability (external validity) of the study results	7
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	8

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

QJM Submission: The provision of seven-day multidisciplinary staffing in Scottish acute medical units: a cross-sectional study

List of abbreviations

AMU – acute medical unit

UK – United Kingdom

NHS – National Health Service

ISD - Information Service Division

HCP – Healthcare professional

OT – occupational therapy

PT – physiotherapy

AHP - allied healthcare professionals

MDT - multidisciplinary