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ORIGINAL ARTICLE

Impact of Late Shift Rapid Response Team (RRT) Input on Length of Stay and Discharge Destination in Emergency Care

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ABSTRAK

Tempoh tinggal yang berpanjangan (LOS) adalah beban kewangan yang besar bagi hospital. Walaupun Ahli Fisioterapi (PT) memperluas peranan mereka dalam bidang displin penjagaan kesihatan yang berlainan, termasuk Perkhidmatan Kecemasan (ES) (Rawatan Kecemasan atau Jabatan Kecemasan (ED) dan bukannya ES), kesan input PT syif lewat pada LOS masih belum diketahui. Objektif kajian adalah untuk menentukan kesan input Pasukan Respons Cepat (RRT) peralihan lewat ke LOS dan destinasi pelepasan. Pesakit yang dirujuk ke RRT (PT / OT) termasuklah mereka yang mempunyai keadaan muskuloskeletal, kardio-pernafasan dan masalah neurologi. Ahli terapi mengkaji tahap mobiliti premorbid pesakit, status sosial dan penilaian mobiliti dan tahap keseimbangan yang lengkap. Ukuran hasil yang dipertimbangkan untuk kajian ini adalah LOS dan destinasi discaj. Sebanyak 131 pesakit dinilai pada 2016/2017. Dari jumlah 131, 72 pesakit tidak lagi menerima rawatan harian. Daripada 138 pesakit yang dirujuk pada 2017/2018, seramai 79 pesakit telah didiscaj dari hospital dari menerima penilaian rawatan harian. Sebilangan besar pesakit mempunyai komorbiditi yang ketara di mana jumlah komorbiditi adalah kira-kira empat keadaan (penyakit) untuk kedua-dua jangka masa tersebut. Destinasi discaj dari hospital termasuklah ke rumah pesakit sendiri, hospital rehabilitasi, rumah panjang dan penempatan sementara dari wad dan ini telah mengurangkan jumlah hari tidur sebanyak 51 hari di hospital. Perkhidmatan RRT peralihan lewat di ED membawa kepada pengurangan LOS dan meningkatkan tujuan discaj dari hospital.

Kata kunci: discaj pesakit, fisioterapi, perkhidmatan kecemasan, penempatan di hospital

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ABSTRACT

Prolonged length of stay (LOS) is a significant financial burden to the hospitals. Although Physiotherapists (PT) are expanding their role in different areas of health care, including Emergency Care (EC), the impact of late shift PT input on LOS is not yet known. The objective was to determine the impact of the late shift Rapid Response Team (RRT) input on LOS and discharge destination. Patients who are referred to the RRT Physiotherapy/Occupational Therapy (PT/OT) include those with musculoskeletal conditions, cardio-respiratory and neurological problems. The therapists establish patient's premorbid mobility level, social status and complete mobility and balance assessments. The outcome measures considered for this study was LOS and discharge destination. A total of 131 patients were assessed during 2016/2017. Out of 131, 72 patients were discharged on the day of treatment. Out of 138 patients referred during 2017/2018, 79 patients were discharged on the day of assessment. Most patients had significant comorbidities when admitted as the number of comorbidities is approximately four conditions for both durations. The discharge destination included from patients own home, rehabilitation hospital, long stay wardand interim placementfrom ward and this has saved 151 bed days in the hospital. Late shift RRT service in the ED resulted in reduced LOS and improved discharge destination.

Keywords: emergency service, hospital stay, patient discharge, physiotherapy

INTRODUCTION

The increase in number of patients with various clinical presentations and morbidities increases burden on Emergency Departments (ED) in hospitals (Lowthian et al. 2012). In general, reducing the waiting time and improving the quality of management is considered as one of the crucial roles in ED (Scott 2014). In the United Kingdom (UK), during the year 2017-18 there were 23.8 million patients in ED, which is an upsurge of 2% compared to 2016-17 and 22% upsurge since 2008-2009 (National Health Service (NHS) Digital 2018). The attendance rate to ED Majors has risen by 7.3% in the last five years, equating to 3000 additional patients daily (NHS Key Statistics: England. 2018). This has a direct impact on ED waiting times. In major EDs in UK, 17.6% of patients waited more than 4 hours in 2017/2018 compared to 16.3% in 2016/2017 due to increased demand in service and therefore more need for MDT's input to stay longer to assess the volume of patients who have waited an extended period of time (NHS Key Statistics: England 2018). This indicates that the number of patients seen in the EDs is on the rise, especially patients who are more than 65 years of age and the rise is more, if the patient is more than 80 years of age (NHS Digital 2018).

The Rapid Response Team (RRT) in Emergency Care consists of Physiotherapists (PT), Occupational Therapists (OT), Physiotherapy Assistant Practitioners and Therapy Technicians. Anecdotal evidence suggested that patients were staying in the hospital overnight to be seen by RRT before they could be discharged home prior to the introduction of late shift service in Emergency Care. By staying overnight the patient occupies an acute bed, resulting in additional expenditure. Additionally it could contribute the need to use escalation beds which are normally used for patients to recover after their surgery.

The physiotherapy profession in ED has seen its profile surge in developed countries, including Australia, Canada and the UK (Lefmann & Crane 2016; Tousignant-Laflamme et al. 2015). In ED, the PTs use their expert knowledge and skills to screen and treat patients to other organisations and support services, including community hospitals and nursing homes (Lefmann & Crane 2016).

The NHS London Care commissioning standards 2011 stated that multidisciplinary team assessment should be started within 12 hours of patient presenting to the ED (Chartered Society of Physiotherapy 2016). The longer waiting times highlight the crucial role of PT in assessing the patients early and preventing unnecessary hospital admissions. The results of the Care Commission Group report have prompted all UK hospitals to review their therapy staffing in the ED. The therapy led services prevent hospital admissions, reduced length of stay, leading to financial savings to the hospital (Crane & Delany 2013).

It is not known clearly whether the late shift RRT was having an impact on opening of escalation beds, which will have a direct impact on length of stay and financial burden on the acute hospital. With regard to that, a pilot audit was conducted with a volunteer PT who worked the late shifts, to evaluate the need for RRT in Emergency Care between 5 and 7 pm. The results of the pilot study suggested that RRT input was beneficial in reducing the length of stay and easing the pressure on the ED. Based on the positive results of the pilot project, a business case was proposed to recruit a PT and an OT for the late shift in ED. Although the benefits of late shift RRT input were observed through the pilot project, it is not clear whether there are positive effects over hospital stay and discharge destination. Furthermore, the positive impact on financial savings and its association with bed days needed further exploration. Hence, the main reason for carrying out the present study was to evaluate the positive results over a period of time, particularly during the winter pressures when there is an immense pressure on the ED. Therefore, the present study set out with the aim to determine the impact of RRT on length of stay (LOS) and discharge destination. The secondary aim was to determine the impact on financial cost and to identify if there is any relationship between the length of stay, clinical condition, age and co-morbidities.

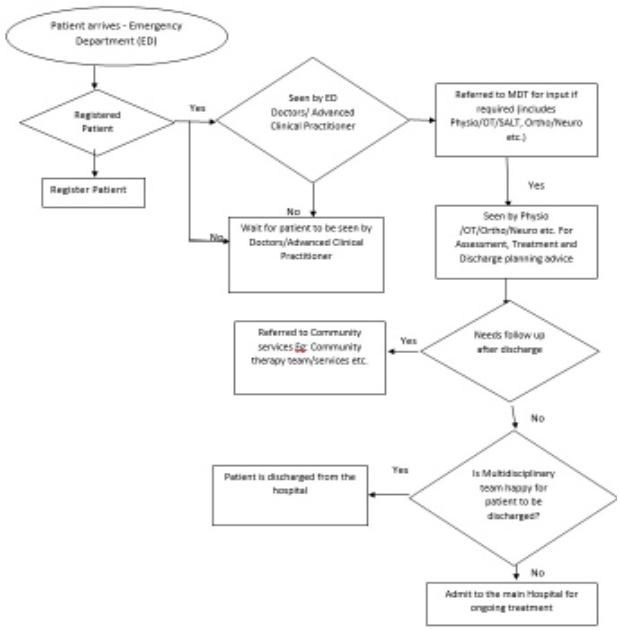

Figure 1: Flow chart of the study methods

MATERIALS AND METHODS

A cross-sectional observational study was conducted with in Emergency Care, including the ED and Medical Assessment Unit (MAU) at the University Hospitals Plymouth NHS Trust. The audit was conducted during the period of December 2016 to March 2017 (4 months) and December 2017 to March 2018 (4 months), which was during winter seasons of both consecutive years.

Patients who were referred for RRT input in ED and MAU, male and female patients with all age groups, those patients admitted from their own home, warden controlled flat, residential home and nursing home were included (Figure 1). Patients who are referred for on-call chest physiotherapy in ED/MAU after 5 pm, patients who were not medically fit and awaiting investigations such as computerized tomography-head/chest, magnetic resonance imaging, X-ray, blood tests, D-Dimer and Doppler scan were excluded from the study. Patients were also excluded from the study, if they were awaiting the images to be reported provisionally and awaiting specialist review before RRT input.

Procedure

Approval was obtained from an Clinical Audit Team, University Hospitals Plymouth NHS Trust (CA_2015-16-332). Prior to the study, the basic referral criteria were explained to the multidisciplinary staffs. The multidisciplinary staffs in the ED included doctors, advanced nurse practitioners (ANP), PTs, staff nurses and OTs. Those patients who fulfilled

the selection criteria for the service were included in the study. Following this, they underwent a routine therapy assessment and treatment. In general, all these patients who were referred for therapy were categorized as musculoskeletal conditions (MSK), cardio-respiratory (CR), neurology (NEU) and other. Once the referral was appropriate, the PT and OT establish a patient's premorbid mobility level, social status and carry out mobility, balance and functional assessment. The outcome measures considered for this study was LOS, discharge destination and financial implications. Primary outcome considered for this study was LOS and discharge destination and the secondary outcome was financial implications.The discharge destination varied from patients own home, rehabilitation hospital, long stay ward, interim placement from ED/MAU.

Statistical methods

The data was analyzed using SPSS version 21 (IBM Corporation; Armonk, New York) statistical software. The SPSS data sheet imported all averaged data from a microsoft excel spreadsheet. The measurement variables were subjected to descriptive and inferential analysis. Description of demographic variables and study variables are presented as mean, standard deviation, frequency and percentage. Results were tested for normal distribution using Shaipiro-wilk test. Spearman rho-correlation coefficient was used to correlate between length of stay and other variables. In addition, discharge destination was presented as Table 3 & 4, which was related to financial cost in the results.

RESULTS

The results of the primary outcome such as LOS and discharge destination are presented in Table 1 and Table 2, Table 3 comparing the two different winter seasons (2016-2017 & 2017-2018) of treatment with RRT and the secondary measures of financial outcome comparing two different

Table 1: Demographic details of the study participants

	December 2016-March 2017 (n=103)	December 2017-March 2018 (n=127)
Age (years)	74.87 ± 18.13	72.91 ± 19.41
Sex	Female 61 (59.22%) Male 42 (40.78%)	Female 80 (63%) Male 47 (37.0%)
Clinical Condition		
Musculoskeletal	62 (60.19%)	76 (59.8%)
Neurology	8 (7.77%)	16 (12.6%)
Respiratory	16 (15.54%)	10 (7.9%)
Other	17 (16.50 %)	25 (19.7 %)
Length of Stay	5.39 ± 6.76	5.41 ± 9.50
No of co-morbidities	3.89 ± 2.664	3.37 ± 2.46

Table 2: Correlation between age, clinical condition and co-morbidities on length of stay (LOS)

	December 2016-March 2017 LOS	December 2017-March 2018 LOS
Age	(r=0.210)* (p=0.033) (p<0.05)	(r=0.213)* (p=0.016) (p<0.05)
Clinical condition	(r=0.132) (p=0.184) (p>0.05)	(r=0.331) (p=0.000) (p<0.05)
Co-morbidities	(r=0.239) (p=0.015)) (p<0.05)	(r=0.309) (p=0.000) (p<0.05)

winter seasons with regard to the impact of RRT is depicted in Table 4.

Table 1 depicts demographic details of the study participants between different duration of years. Similar numbers of samples were encountered in both durations. On the whole, total number of MSK patients was considered to be higher as compared to other clinical presentations. Average length of stay patients varied between 5 to 6 days for the period 2016/2017 winter months and for the 2017/2018 it varied between 5 to 9 days. Number of comorbidities are approximately four conditions for both the durations. This signifies that most of the patients had significant co-morbidities when they were admitted.

Table 2 shows, Spearman rho correlation between the study variables, which showed that there was correlation between age and LOS for both the duration with significant p values (p=0.033) and (p=0.016) for 2016/2017 and 2017/2018 winter months, respectively (p<0.05). Similarly, the number of co-morbidities also showed that there was correlation with LOS with significant p value (p=0.15) and (p=0.000) for the winter 2016/2017 and 2017/2018 (p<0.05), respectively. This showed, when the number of co-morbidities was higher, the LOS extended in both the winter seasons.

Out of 103 patients, 71 (60%) patients were discharged from the hospital on that day of assessment to own home, rehabilitation hospital and placement. Remaining patients were transferred to a long stay ward 29 (23%), 5 (5%) long stay ward to placement (Table 3). Out of 127 patients, 79 (58%) patients were discharged from the hospital on that day of assessment to own home and rehabilitation hospital. Remaining patients were transferred to a long

Table 3: Discharge destinations

Durations	Discharge destinations	Percentage of patients
December 2016-March 2017	Home	60%
	Rehabilitation hospital	8%
	Acute long stay ward	23%
	Placements	4%
December 2017-March 2018	Home	58%
	Rehabilitation hospital	5%
	Acute long stay ward	26%
	Placements	9%

Table 4: Total bed days saved and financial savings

Duration	Financial savings	Total no of bed
December 2016 – March 2017	£ 9295	72
December 2017 – March 2018	£ 10,198	79

stay ward 45 (26%), 12 (9%) long stay ward to placement during the period December 2017-March 2018 (Table 3).

Table 4 depicts that the total number of bed days saved during the period 2016/2017 was 72 with £ 9295 financial savings. The total cost per bed day was given by the hospital management team. Similarly, the total number of bed days saved during the period 2017/2018 was 79 beds with £10,198 financial savings. The total financial savings for both the periods accounted for this study are £19,493.

DISCUSSION

The general findings showed that there was a positive impact of RRT on reducing the patient's LOS in the hospital, discharge destination and financial cost. In addition, it has been found out that there was correlation between LOS, clinical condition, age and co-morbidities. A systematic review recommended taking a holistic perspective to address delayed discharges (Rojas-Garcia et al. 2018). The present study undertook a holistic approach as recommended by the systematic review involving MDT to discharge patients out of the hospital.

LOS was reduced due to introduction of late shift. RRT would have been further enhanced through improvement in internal processes and the development of alternative services (Lewis & Edwards 2015). A mixed-studies systematic review recommended that the direct effects of delayed discharge are through hospital acquired infection (Rojas-Garcia et al. 2018). This is in line with the present study as not all patients were discharged to their original accommodation immediately due to hospital acquired infections in addition to their existing comorbidities. Some of the patients were deemed unsafe to be returned to the original accommodation, therefore after MDT input, we recommended that they were transferred to the rehabilitation hospital as an interim plan. Some of the patients who were unsafe to go home but did not need inpatient rehabilitation and had a complex social history were transferred to an interim placement. Some of the patient had to be transferred from a residential home to nursing home due to the change in their cognition and physical dependence for functional tasks.

A total amount of about £19,493 was saved due to late shift RRT input for the duration 2016/2017 and 2017/2018. The above amount is taken into consideration that RRT saved at least one bed a day per each patient seen, which signifies LOS was reduced when the patients are treated by RRT in the ED for their mobility and balance issues alone. If the patient was admitted to a long stay ward, the LOS

would have increased to more than one day. In this case, the financial savings would have increased significantly given the number of patients seen for the duration studied. All these patients would not have been seen and discharged if there was no late shift therapist for the above-mentioned period. Eventually 72 bed days were saved with a total financial savings of £9295 for the year 2016/2017 and for the year 2017/2018 this saved 79 bed days with a total financial savings of £10,198. The increase in financial savings from 2016/2017 to 2017/2018 could be due the fact that there was an increase in awareness among the MDT about late shift RRT service and the associated referral criteria.

The main limitation of the study could be attributed to the single location of the study conducted at Derriford Hospital only. The other limitation, although insignificant, could be credited to some possible variation in the reported data among the RRT staff.

The present study would like to recommend that the introduction of late shift service on long stay wards throughout NHS hospitals will further enhance the discharges and reduce the pressures on the ED. In addition, we would like to recommend the introduction of a prospective payment system and specialist outpatient service such as first contact practitioner which the NHS is proposing and is already implementing in phases in order to reduce pressures on ED in the acute hospitals.

CONCLUSION

In conclusion, adding a late shift RRT (including PT and OT) service can be an effective change to reduce LOS and improve discharge destinations in Emergency Care.

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