A Study of Community Pharmacy Practice

2. Prescription Dispensing

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ABSTRACT

In a study of prescription dispensing in community pharmacies in Dublin City and county in the Republic of Ireland, the mean number of prescriptions dispensed per hour was found to be 7.7. Differences in the hourly dispensing rate were found between the days of the week and between parts of the day. Pharmacies with computerised dispensing dispensed a mean of 11.8 items an hour compared with 6.0 items an hour for those without computers. Prescriptions which were dispensed free to patients under the General Medical Services scheme accounted for 39% of all prescriptions dispensed.

Key words: *Ireland; Pharmacies, community; Pharmacists, community; Prescriptions; Workload.*

Introduction

In Ireland, prescriptions dispensed in community pharmacies are paid for either by the patients themselves (private prescriptions) or by a third party. The two main state third-party payment schemes are the General Medical Services (GMS) scheme and the Long Term Illness (LTI) scheme.

The GMS provides a free medical service for patients whose income falls below a level which is fixed annually. Prescriptions issued to GMS patients may be taken to any pharmacy in the scheme and almost all pharmacies in Ireland participate in the GMS. The percentage of the population covered by the GMS was 36.7% in 1985 [1].

Patients suffering from certain chronic diseases or disabilities (e.g. diabetes, phenylketonuria) are covered by the LTI scheme. Prescribed drugs appropriate to their condition can be obtained free of charge from any pharmacy in the state.

The number of prescriptions dispensed in pharmacies is one measure of the utilisation of pharmaceutical services in the community. The present study was undertaken to determine the average rate of prescriptions dispensed for each prescription payment category and to determine whether dispensing rates varied accordning to the day of the week, the part of the day or according to pharmacy variables.

Methods

The study was conducted by observation in a random sample of 40 independent community pharmacies in Dublin county in the Republic of

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Ireland, as described previously [2], and took place during the months of January to March, 1985. Four study days were selected systematically for each week of the study so that no week contained the same combination of days. One day was spent in each pharmacy, the day being allocated systematically in consultation with the pharmacy proprietor. The study day in each pharmacy was divided into six parts: early and late morning, lunchtime, early and late afternoon and late at night.

The number of prescriptions (i.e. individual items) dispensed was obtained by observation. Prescriptions were classified as either private, GMS, or LTI. Further classification of prescriptions as either newly issued or repeat prescriptions was done for private prescriptions only: there is no facility for repeat prescriptions in the GMS scheme and it was not possible to readily determine by observation if LTI prescriptions were new or repeat.

Prescription department staffing levels during each period of observation were recorded as either a pharmacist working alone or a pharmacist assisted by others.

Mean hourly dispensing rates classified by prescription type were calculated for each day of the week and for each part of the day as a mean of each pharmacy's dispensing rates for the day of the week or the part of the day. Mean hourly dispensing rates were also classified by computer use and by staffing.

Statistical tests used were the Mann-Whitney U test, the Kruskal-Wallis analysis of variance and the Spearman rank correlation procedure as the underlying distribution of dispensing rates was found not to be normally distributed. Due to large sample sizes, the results of the Mann-Whitney U test are reported as Z approximations and the results of the Kruskal-Wallis analysis of variance as χ^2 values. When a significant result was obtained with the analysis of variance test, Dunn's non-parametric multiple comparison procedure was used to determine which samples differed from which others. A significance level of 0.05 was used for all tests. An indication of the spread of results around the median dispensing rate is given by the interquartile range: the difference between the 75th and 25th percentile values.

Results

A total of 1924 prescription items were dispensed in 250 hours of observation; the number of periods of observation was 130. The distribution of hourly dispensing rates for the periods of observation was positively skewed with a mean value of 7.7; the median value was 6.8 and the interquartile range was 5.1. The mean hourly dispensing rates for private, GMS and LTI prescriptions were 4.0, 3.5 and 0.2 respectively. When private prescriptions were classified as either newly issued or repeat, the mean rates were 2.4 and 1.6.

The mean hourly dispensing rates for each day of the week classified by the type of prescription dispensed are presented in Table 1. The mean hourly dispensing rate on Mondays was higher than on other days of the week for all prescription categories except repeat private prescriptions, the rate for which was highest on Saturdays. The analysis of variance showed that there was a significant difference between the days of the week with respect to the dispensing of new private prescription items ($p < 0.05$). Using Dunn's mutliple comparison test, a significant difference was found between the hourly dispensing rates on Mondays

Table 1 Mean hourly dispensing rate on each day of the week classified by prescription category

Day of the week	Mean hourly dispensing rate					
	Private			GMS	LTI	Total
	Total n = 1004	(New[a]) (n = 609)	(Repeat) (n = 395)	n = 866	n = 54	n = 1924
Monday	5.4	(3.6)	(1.8)	4.9	0.5	10.8
Tuesday	3.7	(2.7)	(1.0)	3.0	0.1	6.9
Wednesday	4.0	(2.2)	(1.8)	3.9	0.3	8.2
Thursday	4.1	(2.5)	(1.6)	3.9	0.1	8.1
Friday	3.7	(2.5)	(1.2)	3.1	0.1	6.9
Saturday	3.3	(1.1)	(2.2)	2.1	0.3	5.6

[a]Kruskal-Wallis analysis of variance, $\chi^2 = 12.112$, df = 5, $p < 0.05$.

Table 2 Mean hourly dispensing rate on each part of the day classified by prescription category

Part of the day	Mean hourly dispensing rate					
	Private			GMS[d]	LTI	Total[e]
	Total[a]	(New[b])	(Repeat[c])			
Early morning	2.7	(1.6)	(1.1)	2.8	0.2	5.8
Late morning	4.2	(2.4)	(1.8)	5.4	0.3	9.9
Lunchtime	4.4	(2.2)	(2.2)	0.8	0.0	5.1
Early afternoon	3.9	(2.4)	(1.5)	2.8	0.3	7.2
Late afternoon	4.7	(2.6)	(2.1)	3.5	0.1	8.3
Late night	5.2	(4.7)	(0.5)	3.2	0.2	8.5

Kruskal-Wallis analysis of variance:
[a] $\chi^2 = 14.414$, df = 5, p < 0.02.
[b] $\chi^2 = 12.878$, df = 5, p < 0.05.
[c] $\chi^2 = 14.563$, df = 5, p < 0.02.
[d] $\chi^2 = 17.243$, df = 5, p < 0.005.
[e] $\chi^2 = 15.557$, df = 5, p < 0.01.

and Saturdays. No other significant differences were found.

When analysed by the part of the day (Table 2), significant differences were found with respect to the hourly dispensing rates of private prescriptions (p < 0.02), GMS prescriptions (p < 0.005) and all prescription types (p < 0.01). The results of Dunn's multiple comparison test showed that the significant differences lay between the early morning and late night periods for private prescriptions; between the late morning and lunch-time periods for GMS prescriptions; and between the early and late morning periods for all prescriptions types. When private prescriptions were classified as either new or repeat, the significant differences between the dispensing rates at different times of the day remained (p < 0.05 and p < 0.02). Dunn's multiple comparison test showed that the differences lay between the early morning and late night periods for new private prescriptions and between the lunchtime and late night periods for repeat private prescriptions.

The mean proportion of items dispensed which were GMS prescriptions was 0.39 and this proportion was found to increase with an increasing rate of prescription dispensing (Spearman's $r_S = 0.58$; p < 0.001).

Pharmacies which had computerised their dispensing (n = 12) dispensed, on average, 11.8 items an hour compared with an average of 6.0 items an hour for those without computers (n = 28). The difference between them with respect to the distribution of hourly dispensing rates was found to be statistically significant (Mann-Whitney U test, Z = -2.262, p < 0.001).

Pharmacists were found to dispense on their own in 52 periods of observation and to have assistance in dispensing in 78 periods of observations. Those who dispensed alone dispensed an average of 5.9 items per hour while when assisted, 8.6 items per hour were dispensed. The distribution of hourly dispensing rates was found to differ significantly between the two groups (Mann-Whitney U test, Z = -2.626, p < 0.01).

Discussion

At the mean hourly rate of dispensing, approximately 62 items would be dispensed in an eight-hour day and 400 in an average 52-hour [3] week. These figures may possibly be an overestimate of dispensing rates over the whole year as the study took place during late winter and early spring months, months in which more prescriptions may be dispensed than at other times during the year. The mean values for dispensing found in the present study are lower than those reported in studies in Canada (72 prescriptions per day) [4], the United States (8.1 prescriptions per hour) [5], Australia (520 prescriptions per week) [6] and Sweden (1000 per week) [7], although comparison with other countries is limited by factors including differences in the average population per pharmacy and in methods of payment for prescriptions which may affect consumption of prescribed medicines. The differences may also be explained by changes in time as the values above were reported over a period between 1975 and 1984.

Variations in dispensing rates found between the days of the week and between different parts of the day may be related to pharma-

cies' opening hours, physicians' visiting times and consumers' shopping patterns.

Dispensing of GMS prescriptions accounted for 39% of all dispensing on average, while the percentage of the population in Dublin covered by the GMS was 26% in 1985 [1]. Thus GMS patients obtained proportionately more prescriptions than private patients. This finding is supported by the results of a study [8] of the consultation and prescribing rates of GMS and non-GMS patients which found that GMS patients were more likely than non-GMS patients to visit a doctor and to obtain a greater number of prescriptions. This may be in part due to differences between the age distribution in the general population and that in the GMS population, in which young children and young adults are under-represented while the elderly are over-represented [9].

The GMS proportion of dispensing was found to be moderately positively correlated with the number of prescriptions dispensed. Therefore pharmacies with high dispensing rates depend more on GMS prescriptions for their dispensing volume than pharmacies which dispense a lower number of prescriptions. Because of lower prescribing rates to private patients [10], the viability of pharmacies located in areas of high private patient population may depend more on prescription charges than on prescription volume.

Pharmacies with computers had dispensing rates which were higher than those without computers, suggesting that high dispensing volumes may be considered by pharmacists to be a prerequisite for computerisation. A similar trend was also found by Kirking et al. [10].

The study's finding on staffing levels suggests (as might be expected) that more staff are employed in dispensing tasks as the workload increased, a result also found by Dickson and Rodowskas [11].

Conclusion

In conclusion, the results suggest that the prescription rate was lower in Dublin pharmacies than in other countries. The relationship between GMS dispensing and dispensing of all prescriptions suggests that high volume dispensing is dependent on prescriptions from GMS patients, who were found to obtain proportionately more prescriptions than private patients.

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