

APPLICATION OF THE PARETO ANALYSIS REGARDING THE RESEARCH ON THE VALUE OF PREPARATIONS IN COMMUNITY PHARMACIES FROM CLUJ-NAPOCA, ROMANIA

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Abstract

The paper presents the value of the preparations in 10 community pharmacies from Cluj-Napoca over a period of 18 months. The aim of this paper has been the selection of the most valuable preparations with the help of the Pareto method. The selected preparations were: the Petrini paste, the oxygenated water, the rivanol solution 1%, the menthol mixture, the diluted alcohol, Sabouraud's tincture (Sabouraud's agar), the face cleansing cream, the borax glycerine and the tincture of iodine. They represent 22.5% of the total number of formulations and bring to the pharmacies 80% of the total cashing in for the formulations. The research indicated that the preparations in the pharmacies may represent an important source of revenue. The value of the preparations in the pharmacy on the first place (29027.90 lei) was 23.74 times higher than the value of the preparations in the pharmacy on the last place (1222.70 lei). The results of the research indicate the need to reorganize the management of the compounding activity in the pharmacies where this is a minor activity. Therefore all the necessary conditions for the preparations should be secured: substances, equipment and appropriate places, focusing on the most valuable preparations. In order to make the pharmacy efficient it is essential not to decline any preparation request. The Pareto analysis proved to be a valuable work instrument in the analysis of the pharmacy's activity.

Rezumat

Lucrarea analizează valoarea elaborărilor preparate în 10 farmacii comunitare din Cluj-Napoca, pe o perioadă de 18 luni. Scopul acestei lucrări a fost alegerea celor mai valoroase elaborări cu ajutorul metodei Pareto. Elaborările selecționate au fost: pasta Petrini, apa oxigenată, soluția de rivanol 1%, mixtura mentolată, alcoolul diluat, tinctura Sabouraud, crema de curățat fața, glicerina boraxată și tinctura de iod. Ele reprezintă 22,5% din numărul total al elaborărilor preparate și furnizează farmaciilor 80% din totalul încasărilor provenite din elaborări. Cercetarea efectuată a arătat că elaborările preparate în farmacie pot reprezenta o importantă sursă de câștig. Valoarea elaborărilor preparate de farmacia de pe primul loc în clasament (29027,90 lei) a fost de 23,74 de ori mai mare decât valoarea elaborărilor preparate de farmacia de pe ultimul loc (1222,70 lei). Rezultatele cercetării efectuate sugerează nevoia reorganizării managementului activității de preparare a elaborărilor, în farmaciile în care această activitate este nesemnificativă. În acest scop, se vor asigura toate condițiile necesare preparării elaborărilor: substanțe, aparatură și spațiu corespunzător, punându-se accent pe elaborările cele mai valoroase. Pentru eficientizarea

farmaciei este important însă, să nu se refuze nici o solicitare de elaborare. Analiza Pareto s-a dovedit a fi un prețios instrument de lucru în analiza activității farmaciei.

Keywords: preparations (formulations), the value of the preparations, community pharmacies, the Pareto managerial method

Introduction

The Pareto analysis, also known as 80/20 Rule or the Pareto Rule, is a modern management method which allows those using it to choose the essential elements of an activity or business. The model at the basis of the 80/20 Rule was discovered by the Italian economist Vilfredo Pareto in 1897 [9].

The 80/20 Rule shows that in any activity some things are much more important than others. The typical model of the Pareto Rule indicates the fact that 80% of the results or effects are the consequence of 20% of the causes. The 80/20 Rule is not a strict formula. Sometimes the cause-effect relation is closer to the 70/30 ratio than to the 80/20 ratio, but very rarely 50% of the causes lead to 50% of the results [6,7,9,12,13,14].

The objectives of the present paper were: establishing the value of the preparations in the pharmacies and applying the Pareto method to identify the most valuable preparations.

Materials and Methods

The studied materials were the books of preparations from 10 community pharmacies in Cluj-Napoca. The study has been conducted over a period of 18 months between 1 January 2006 – 30 June 2007.

In order to make a representative selection from all the pharmacies in Cluj-Napoca, there has been used a method of sampling based on some statistical algorithms of random stratified sampling [1,2,3,5,15], taking into account homogeneity and the following criteria of stratification: the localisation in territory and the density of pharmacies in different areas of the city.

There have been selected 10 community pharmacies representing 10% of the total number of the pharmacies in Cluj-Napoca, at the time of the research.

With respect to the criterion of localization in space of the pharmacies, the sample of pharmacies has been selected so as to include pharmacies from all regions of the city, both from the centre and from all neighbourhoods.

From all the regions of Cluj-Napoca there have been selected a number of pharmacies proportional to the total number of the existing

pharmacies in the given region. In the regions with more pharmacies the number of the selected pharmacies was higher, while in the regions with fewer pharmacies the number of the selected pharmacies was lower.

For every pharmacy under observation the following data have been registered in tables: the date, the number of the compounding act, the preparation, the price of the preparation in lei [8,10,11]. The registered data have been centralized into synthesis tables, calculating the total value in lei for each preparation. Then the classifications of the preparations in the pharmacies under study have been performed, by arranging the total value in lei in decreasing order. Out of the total value of the preparations there have been calculated the percentages.

Results and Discussion

The results of the research on the preparations in the 10 pharmacies under study (noted F1, F2, ..., F10), in the given period of time, were centralized in Table I.

Table I

The values in lei of the preparations in the 10 pharmacies from Cluj-Napoca, in the period 01.01.2006 – 30.06.2007

No	Preparations	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
1	Boricated Alcohol 4%	150	-	-	-	450	439.20	40	-	-	-
2	Camphorated Alcohol 10%	147	-	-	-	-	48.60	17	-	-	12
3	Diluted Alcohol	1214	765.10	1008	-	-	1010	500	159.60	700	180
4	Mentholated Alcohol 1%	800	-	738.40	-	230	170.10	214.20	-	-	50
5	Salicylic Alcohol 1%	-	-	-	-	-	365.50	-	-	-	-
6	Oxygenated Water 3%	3200	693.60	399.60	590	1145	1214	216	36	255	180
7	Base III	193.70	183.20	-	-	127.20	234.30	63	22	60	130
8	Face Cleansing Cream	1088	-	-	1560	-	-	429.30	15.40	234	1024
9	Face Cream with Vitamins	-	-	-	-	-	-	644.22	-	-	-
10	Dr. Butnariu Cream	-	-	-	-	-	-	2221.80	-	-	-
11	Eritromicin + Physiological Serum	-	-	-	-	-	116	-	-	-	-
12	Borax Glycerine 10%	2240	39.80	150	-	480	542.10	228.32	95	60	135
13	Borax Glycerine + Anesthesine	-	-	-	-	140	113.80	-	-	-	-
14	Borax Glycerine + Nystatin	-	-	-	-	160	-	-	-	-	40
15	Borax Glycerine + Anesthesine + Nystatin	-	-	-	-	315	-	-	-	-	-
16	Glycerinated Gelatin (Base)	-	-	-	-	-	-	35	-	-	-

No	Preparations	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
17	Menthol Mixture	2363	-	-	729	1080	1250	261.83	100	297.84	67.5
18	Petrini Paste	9675	573.70	1700	966	11310	2080	1953.90	604.20	4680	800
19	Dr. Butnariu Nose Drops	-	-	-	-	-	-	778.50	-	-	-
20	Nose Drops with Biseptol [®] (Co-trimoxazole)	-	-	-	-	-	-	39	-	-	-
21	Ephedrine Serum 1%	-	-	70	-	-	-	-	-	86	-
22	Physiological Serum	990	-	-	-	-	9.89	-	-	-	-
23	Dr. Lădaru Syrup	-	-	-	-	-	270	-	-	-	-
24	Dr. Salvan Syrup	-	-	-	-	-	1394	-	-	-	-
25	Antiperspirant Solution	-	-	-	-	-	-	292.70	-	45	-
26	Boric Acid Solution 3%	-	-	-	-	-	65.10	23	-	-	-
27	Methylene Blue Solution 1%	540	-	-	-	315	144	164	-	85.50	15
28	Fuchsin Solution 1%	-	-	-	-	200	-	100	-	-	-
29	Proctanin Solution 1% (Gentian Violet)	450	-	-	-	150	187.50	-	-	120	10
30	Rivanol Solution 1%	3025	660.60	548.70	580	1050	1040	360	82	288	100
31	Lugol's Solution 5%	-	-	-	-	-	45	-	-	-	-
32	Sulfate Shampoo	-	-	-	-	-	-	-	22	-	-
33	Tincture of Iodine 2%	562.50	-	954.20	456	-	220	120.35	-	600	90
34	Sabouraud's Tincture	600	-	-	378	3000	-	150	32	180	80
35	Antihemorrhoid Ointment	-	-	-	-	-	-	156.40	-	-	-
36	Urea Ointment 10%	-	-	-	-	-	-	8.40	-	-	-
37	Ichtiol Ointment 10%	880	-	312	230	200	221	116.40	22	175	165
38	Callosity Cream	640	-	-	-	-	116.80	71.50	-	-	-
39	Salicylic Ointment 5%	-	-	-	-	-	-	84	32.50	-	-
40	Simple Ointment	270	296.60	-	-	-	-	151.40	-	-	7.5
	TOTAL	29027.9	3212.62	5880.9	5489.2	20352.2	11297.2	9440.17	1222.7	7866.34	3086

Analysing the data from Table I there can be noticed that the number of the preparations in the 10 pharmacies has been 40 [4]. The values of the preparations are very different, varying between 29027.90 lei and 1222.7 lei. 3 formulations can be found in all the pharmacies: the oxygenated water, the Petrini paste and the rivanol solution 1%. Other frequently solicited preparations have been the following: diluted alcohol, borax glycerine, menthol mixture, tincture of iodine, Sabouraud's tincture (Sabouraud's agar) and ichtiol ointment. Then a classification of the total value of the formulations in all the 10 pharmacies has been performed (Table II).

Table II

The classification of the preparations taking into account the total value in lei

No.	Preparations	Total value of the preparations in lei	% of the total value of the preparations
1	Petrini Paste	34343.19	35.45
2	Oxygenated Water 3%	7929.6	8.19
3	Rivanol Solution 1%	7734.31	7.98
4	Menthol Mixture	6148.97	6.35
5	Diluted Alcohol	5537.09	5.72
6	Sabouraud's Tincture	4420	4.56
7	Face Cleansing Cream	4350.5	4.49
8	Borax Glycerine 10%	3970.22	4.10
9	Tincture of Iodine 2%	3003.05	3.10
10	Ichtiol Ointment 10%	2320.9	2.40
11	Dr. Butnariu Cream	2221.75	2.29
12	Mentholated Alcohol 1%	2202.7	2.27
13	Dr. Salvan Syrup	1394	1.44
14	Methylene Blue Solution 1%	1263.5	1.30
15	Boricated Alcohol 4%	1079.2	1.11
16	Base III	1013.39	1.05
17	Physiological Serum	999.89	1.03
18	Piactanine Solution 1% (Gentian Violet)	917.5	0.95
19	Callosity Cream	828.3	0.86
20	Dr. Butnariu Nose Drops	778.5	0.80
21	Simple Ointment	725.54	0.75
22	Face Cream with Vitamins	644.22	0.66
23	Salicylic Alcohol 1% (salicylic acid in alcohol)	365.5	0.38
24	Antiperspirant Solution	337.7	0.35
25	Borax Glycerine + Anesthesine + Nystatin	315	0.33
26	Fuchsine Solution 1%	300	0.31
27	Dr. Lădaru Syrup	270	0.28
28	Borax Glycerine + Anesthesine	253.75	0.26
29	Camphorated Alcohol 10%	224.6	0.23
30	Borax Glycerine + Nystatin	200	0.21
31	Antihemorrhoid Ointment	156.4	0.16
32	Ephedrine Serum 1%	156	0.16
33	Salicylic Ointment 5%	116.5	0.12
34	Eritromycin + Physiological Serum	116	0.12
35	Boric Acid Solution 3%	88.1	0.09
36	Lugol's Solution 5%	45	0.05
37	Nose Drops with Biseptol ^(R) (Co-trimoxazole)	39	0.04
38	Glycerinated Gelatin (Base)	35	0.04
39	Sulfate Shampoo	22	0.02
40	Urea Ointment 10%	8.4	0.01
TOTAL		96875.27	100

From Table II there can be observed that the most valuable preparation is the Petrini paste to which a total value of 34343.19 lei corresponds, which represents 35.45% from the total value of the preparations.

The first 9 preparations (22.5% from all the preparations): the Petrini paste, the oxygenated water, the rivanol solution, the menthol mixture, the diluted alcohol, the Sabouraud's tincture (Sabouraud's agar), the face cleansing cream, the borax glycerine and the tincture of iodine generate 80% (more exactly 79.94%) of the total value of the formulations. The rest of the preparations (31), representing 77.5% from the total, are less valuable for pharmacies bringing only 20% from the total value of the preparations. It can be noticed that the Pareto method, with a small variation compared to the typical model of the rule (22.5/80 instead of 20/80), can be applied and is useful in analysing the value of the preparations in pharmacies.

Based on the results presented in Table I, a classification of the pharmacies has been performed, considering the total value of the preparations, calculating the average value of the preparations within a month (Table III).

Table III

The classification of the pharmacies considering the total value in lei of the preparations in the period under study

No.	Pharmacies	Total value in lei of the preparations during 18 months	Average value in lei of the preparations / 1 month
1.	F1	29027.9	1612.66
2.	F5	20352.2	1130.67
3.	F6	11297.24	627.62
4.	F7	9440.17	524.45
5.	F9	7866.34	437.01
6.	F3	5880.9	326.71
7.	F4	5489.2	304.95
8.	F2	3212.62	178.47
9.	F10	3086	171.44
10.	F8	1222.7	67.92

From Table III, there can be noticed that the pharmacies under study present notable differences concerning the value of the preparations. Thus, the top of the classification includes pharmacies F1 (with the value of preparations of 29027.90 lei and an average of 1612.66 lei per month) and pharmacy F5 (with the value of preparations of 20352.20 lei and an average of 1130.67 lei per month). The poorest results related to the value of the preparations have been registered by pharmacy F8 with a total value of the preparations of 1222.70 lei and an average value of 67.92 lei. Calculating the ratio between the value of the preparations in the first placed pharmacy (F1) and the last placed pharmacy (F8), the result is 23.74, so the value of the preparations in the pharmacy on the first place is 23.74 times higher than the value of the preparations in the last placed pharmacy.

The research has shown that the preparations may represent an important source of income for any pharmacy. Based on the results of the Pareto analysis presented above, we suggest that in the case of the pharmacies with low incomes derived from the compounding activities, a management reorganization of the compounding activity might be needed. It is important that the pharmacy manager should not neglect this aspect. First of all they would have to take interest in the formulations selected by means of the Pareto method, so that they should not miss from the pharmacy. The pharmacy should be supplied with everything needed for the compounding under good conditions: substances, utensils, equipment and an appropriate environment which should be created. The other preparations that haven't been selected by means of the Pareto method shouldn't be declined either, but the pharmacy compounding activity should be simplified by preparing in the form of magistral prescriptions, at request. In this way, time would be saved, as the compounding act would not be organized, the formula of the preparation being only registered in the book of magistral prescriptions.

Conclusions

The research has been conducted on 10 community pharmacies from Cluj-Napoca (10% from the total number of pharmacies existing in the city, at the time of the research). The period under study has been of 18 months, between: 01.01.2006 -30.06.2007.

The Pareto method has been applied to select the most valuable preparations in the pharmacies from Cluj-Napoca, out of the total of 40. The obtained results confirm the validity of the Pareto method. The first 9 formulations, representing 22.5% of the total number of preparations determines 80% of the total value of the cashing in by preparations. These are: the Petrini paste, the oxygenated water, the rivanol solution 1‰, the menthol mixture, the diluted alcohol, the Sabouraud's tincture (Sabouraud's agar), the face cleansing cream, the borax glycerine and the tincture of iodine. The Petrini paste may be considered the most valuable preparation as it brings in 35.45% from the total value of the preparations.

The obtained results show big differences between the values of the preparations in the pharmacies under study. Thus, the value of the formulations done in the pharmacy on the first place (F1) is 23.74 times higher than the value of the formulations in the pharmacy on the last place (F8).

The preparations may represent an important source of revenue for a pharmacy. Therefore in the pharmacies with reduced revenue from the preparations, the manager of the pharmacy will have to reorganize the

compounding activity in order to make it profitable, securing all the necessary conditions for the preparations: substances, equipment and an appropriate place for this activity. The preparations selected by means of the Pareto method will be considered first of all.

The results obtained in the present study indicate the fact that the Pareto analysis represents a valuable work instrument which is of great help in the pharmacy manager's activity.

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