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DEVELOPMENT OF METHODOLOGICAL APPROACHES TO THE ASSORTMENT MANAGEMENT OF PHARMACY NETWORKS BY PRINCIPLES OF CATEGORICAL MANAGEMENT

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Визначення правильного стратегічного курсу фармацевтичної організації і напрямків підвищення її конкурентоспроможності є найбільш відповідальною справою, оскільки формує пріоритети її діяльності на відносно довгострокову перспективу. Управління асортиментом є однією з найважливіших функцій будь-якого аптечного закладу. Сучасний ринок, який характеризується, як «ринок покупців» активно вимагає впровадження в діяльність аптечних мереж сучасних інструментів і технологій управління товарним асортиментом.

Метою роботи є розробка методичних підходів до управління асортиментом аптечних мереж за принципами категорійного менеджменту.

Методи. У роботі було використано системний та логічний аналіз, методи порівняльного, документального, структурно-функціонального та економіко-статистичного аналізу.

Результати дослідження. Для ефективного управління асортиментом аптечних мереж розроблено алгоритм управління товарним асортиментом в аптечних мережах на принципах категорійного менеджменту, який передбачає: визначення товарних категорій, їх внутрішньої структури та ознаки, за якими будуть згруповані препарати (за АТС-класифікацією (першого рівня)); аналіз основних фінансово-економічних показників за виділеними товарними категоріями; визначення ролі кожної товарної категорії відповідно до її впливу на досягнення цілей аптечної мережі; вивчення попиту за кожною товарною категорією та її внутрішнім наповненням; оцінка поточного стану товарних категорій, її структури і визначення можливих змін при роботі з її асортиментним наповненням в майбутньому; оптимізацію за кожною товарною категорією ланцюжка руху товару від закупівлі і формування товарних запасів до безпосереднього продажів; обґрунтування асортиментної політики за обраними критеріями та оцінка її ефективності; реалізацію асортиментної політики. Запропоновані методичні підходи були опрацьовані на прикладі однієї з досліджуваних аптечних мереж.

Висновки. Доведено, що категорійний менеджмент – це інструмент управління асортиментною політикою аптечних мереж, який дозволяє виділити групи фармацевтичної продукції, які будуть спрямовані на виконання певних цілей аптечних мереж, що відповідно сприятиме реалізації стратегії розвитку аптечних мереж

Ключові слова: управління асортиментом, категорійний менеджмент, аптечні мережі, стратегічні цілі, товарні категорії

1. Introduction

The most responsible business is determining the correct strategic course of the pharmaceutical organization and the directions of increasing its competitiveness, as it forms the priorities of its activities in the relatively long-term perspective. Today, pharmacy networks have become important players in the pharmaceutical market of Ukraine, they control up to 71 % of the domestic market, and according to experts, this trend will be maintained. Therefore, the quality of the medical care of the Ukrainian population depends on the effective functioning of pharmacy networks. Therefore, the management assortment is one of the most important functions of any pharmacy. It is from the assortment largely depends on the efficiency of pharmacies' work and the level of competitiveness.

2. Formulation of the problem in a general way, the relevance of the theme and its connection with important scientific and practical issues

The current stage of development of the retail segment of the pharmaceutical market of Ukraine is

characterized by a large number of pharmacy networks and local pharmacies, each pharmacy should solve the issues of effective management assortment. Taking into account the fact, that more than 9 thousand trade names of medicines are sold in Ukraine, it becomes obvious – this is a difficult task. Today pharmacy establishments rely on expert opinions of specialists of procurement departments or on the analysis of the activities of its competitors in the performance of such work.

3. Analysis of recent studies and publications in which a solution of the problem and which draws on the author

Thus, in particular, the socio-economic aspects of managing the assortment of pharmacies in terms of the implementation of reimbursement of the cost of pharmaceutical aid are presented in [1]; the use of an economic component in the formation of an assortment policy of pharmaceutical companies is researched in [2]; in the publication [3] investigated the factors taken into account when introducing of medicines and medical products into the assortment of pharmacy networks.

In work [4] studied the economic efficiency of the assortment of medicines in the pharmacy network. Scientific approaches to modeling the assortment of drugs and studying the structure of the range of drugs in pharmacies are presented in papers [5, 6]. The publication [7] provides tools for automated integrated ABC / FMR / (XYZ) / VED analysis.

4. Allocation of unsolved parts of the general problem, which is dedicated to the article

At the same time, the management assortment of pharmacy networks (PN) on the principles of categorical management (CM) on the basis of the use of modern mathematical apparatus are still unexplored.

5. Formulation of goals (tasks) of Article

The aim of the study is to develop methodological approaches to the management assortment of PN in accordance with the principles of CM in the changing market environment, based on the application of modern mathematical methods. The advantages of using CM are following [7–15]:

- CM is aimed at providing maximum profitability indicators PN and in accordance with the most complete satisfaction of consumers' needs;
- allows you to reduce the time spent on the choice and purchase of the necessary product;
- enables to form an optimal assortment of goods, develop an effective pricing policy and merchandising program taking into account the specificity of the pharmacy: its location, financial capabilities and format;
- allows you to increase sales in the pharmacy, as well as increase the turnover of commodity stocks;
- takes into account the factors influencing the implementation of medicines within a specific category, takes into account the seasonality and profitability of commodity categories;
- promotes optimization of the assortment structure within a specific commodity category;
- allows to optimize the entire chain of product movement and analyze the impact of different product groups one to one;
- facilitates closer and mutually beneficial cooperation between the manufacturer, supplier and pharmacy establishment;
- usage of the CM can increase the margin of pharmacy networks by 0.3-1.5 % in the medium-term period.

The set goal has determined the following tasks:

- to improve the algorithm of management of the product assortment in the PN on the principles of CM due to the use of modern mathematical apparatus;

- to work out the proposed methodological approaches on the example of the investigated PN.

6. Statement of the basic material of the study (methods and objects) with the justification of the results

Pharmacies in the course of their activities constantly seek to optimize the organization of trade, increase profitability by maximizing the satisfaction of consumer inquiries. According to the domestic and world practice, these goals can be achieved by introducing CM technology, in which commodity categories are formed on certain features and consumer properties [7].

We were offered an improved algorithm for managing the product assortment in the PN on the principles of CM, which was worked out on the example of one of the studied average PN (Fig. 1). The offered algorithm allows to balance the assortment, reduce the number of illiquid commodity items, optimize inventory and increase the profitability of sales.

The first stage of implementation of the proposed algorithm in the work of PN is the definition of product categories (PC). We used ATC classification (first level) as an attribute of classification for formation the structure of PC. According to it, the entire range of drugs in the studied PN is divided into 14 categories. The main financial and economic indicators were established and analyzed for each of the allocated PC: the number of trades, sales, margin profit and trade margin. The assortment structure in the investigated PN is oriented on a wide range of consumers by the analysis' results. Thus, the maximum number of trade names was observed in the context of the ATC classification in the PN and in general in Kharkiv in group A «Means affecting the digestive system and metabolism», the minimum – in group V «Other medicines» (Fig. 2).

The maximum share of positions of the studied PN in the total number of commodity nomenclatures in the Kharkiv city as a whole is 56.0 % and belongs to the group P «Antiparasitic agents, insecticides and repellents». The share of trade names medicines of such traditional hospital groups as J «Antimicrobials for systemic use», L «Antitumor drugs and immunomodulators», B «Blood and haemopoiesis» and H «Hormones for systemic use (except for sex hormones and insulin)», in the investigated PN is much smaller than in the city as a whole. It was concluded, after having reviewed the structure of the assortment of the studied PN, that it is expedient to improve it taking into account the location specifics.

It should be noted that ATC classification groups with a high proportion of sales in monetary terms, both in the studied PN and in the city as a whole, are characterized by a rather wide variety (Fig. 3).

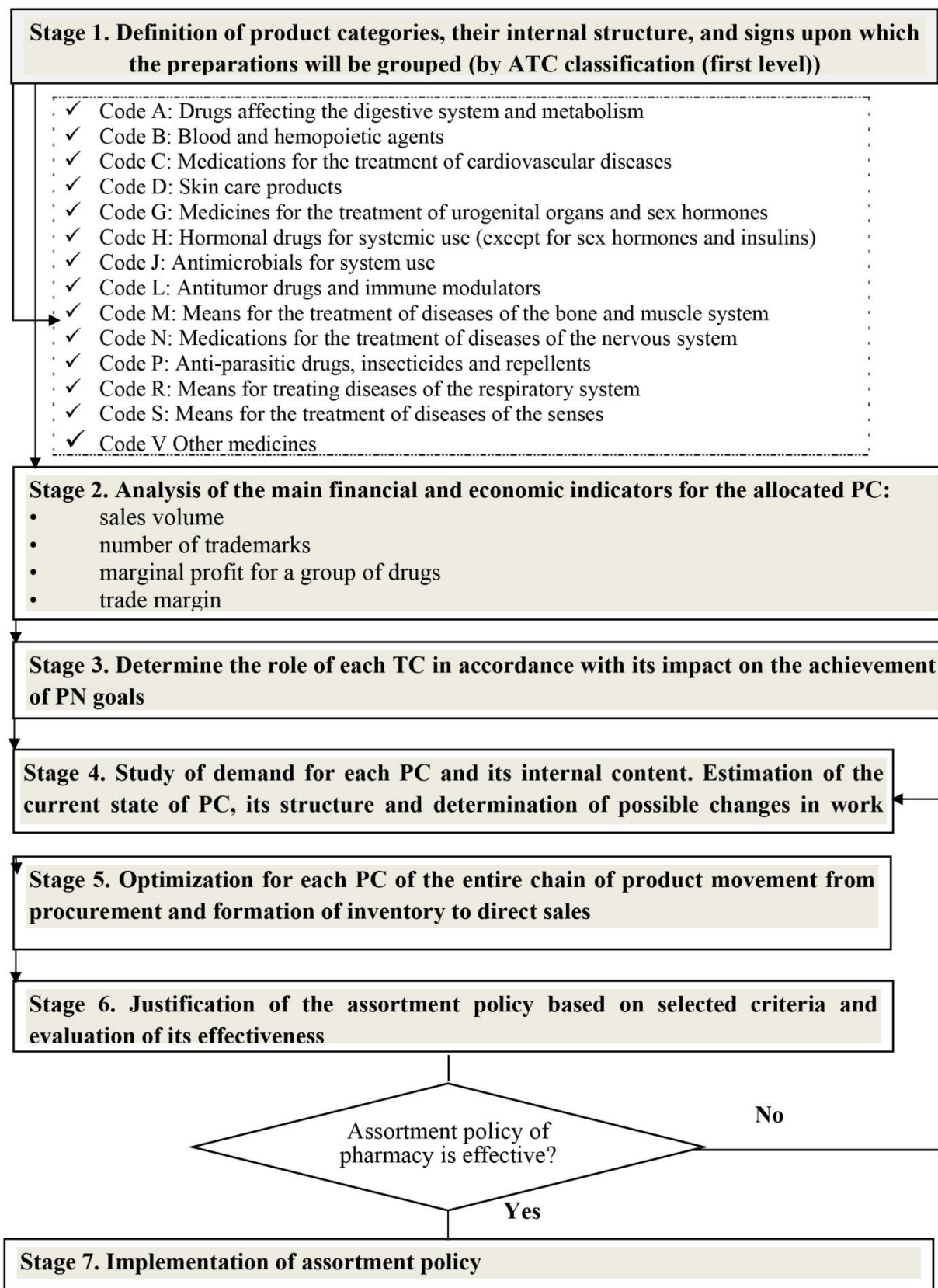


Fig. 1. Improved algorithm of implementation of CM in the activity of PN

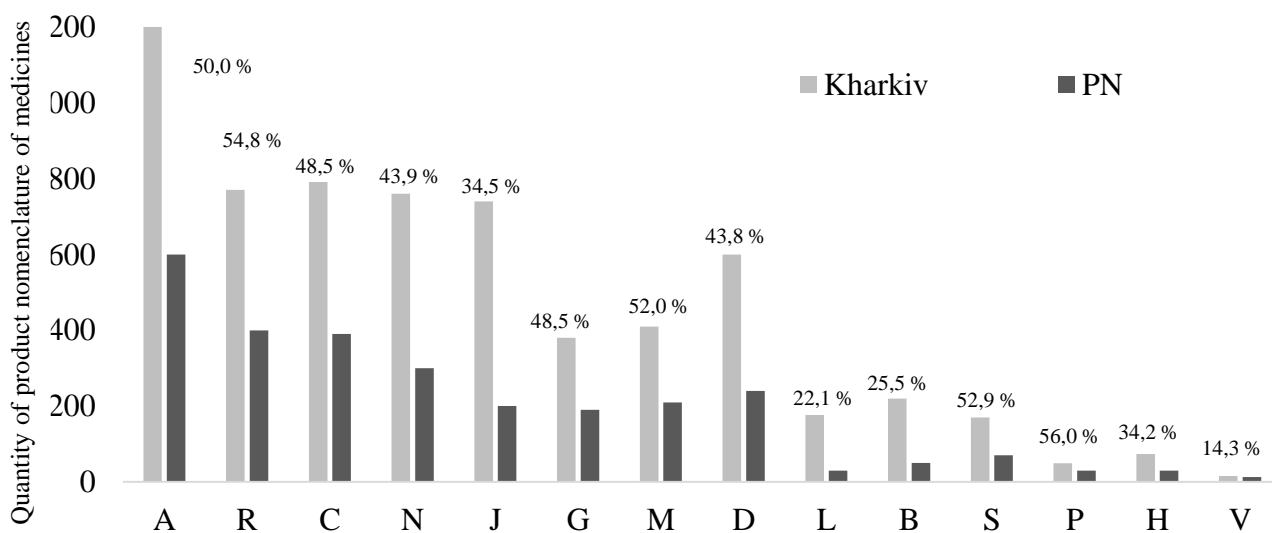


Fig. 2. Number of trade names of medicines in the studied PN and in Kharkiv as a whole

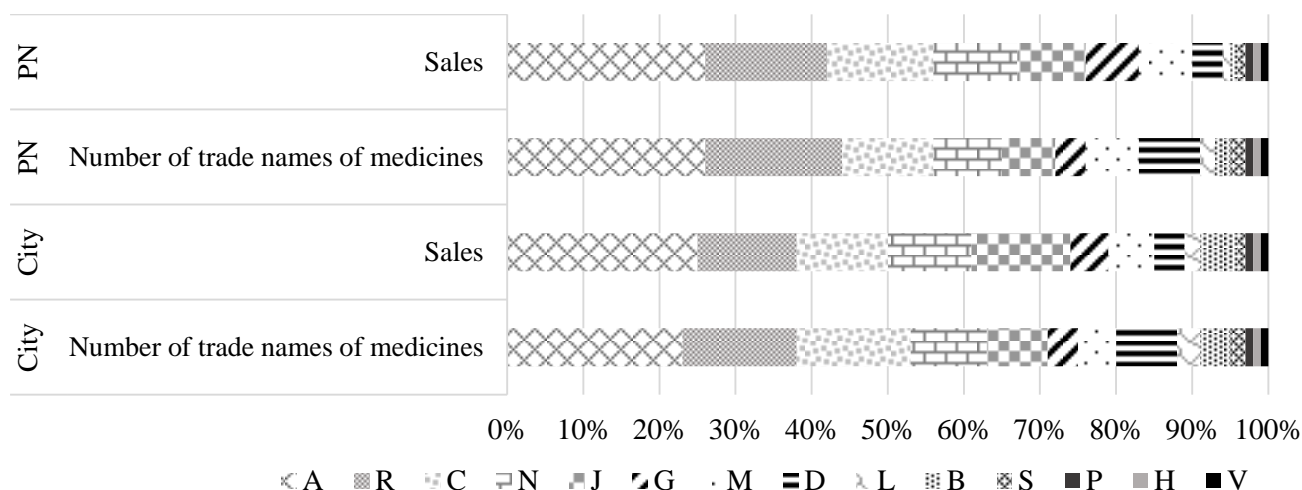


Fig. 3. Distribution of sales in monetary terms by the number of trademarks of medicines in the studied PN and in the city as a whole, in terms of ATC classification of the first level in the first half of 2017

However, a more detailed study of the structure of PC shows that it is advisable to reduce the number of trade names in some groups by eliminating positions that are not sold, and some, on the contrary, increase due to the introduction in the product's assortment of those commodity items that are in demand, characterized by high profitability and turnout.

The next stage of implementation of the proposed algorithm in PN's activity is an analysis of the main financial and economic indicators for each PC. We analyzed the profitability indicators of the studied PN for the first half of 2017. The analysis of marginal profit showed that the maximum gross margin from the sale of medicines in the studied PN, as well as in general in the

pharmaceutical sales market, brings category A «Medications affecting the digestive system and metabolism» – 23.0 %. We also analyzed the level of trade margin for all 14 groups of PC. It was established that its highest level is observed with the preparations of the groups B «Blood and haemopoietic agents» and L «Antitumor drugs and immunomodulators», low – in categories V «Different medicines» and G «Medications for the treatment of diseases of urogenital organs and sex hormones» (Fig. 4).

We have identified conditional groups of drugs due to their impact on the financial and economic performance of the pharmacy institution, due to analysis of demand, sales volume, marginal profit and trade margin in the studied PN for the first half of 2017.

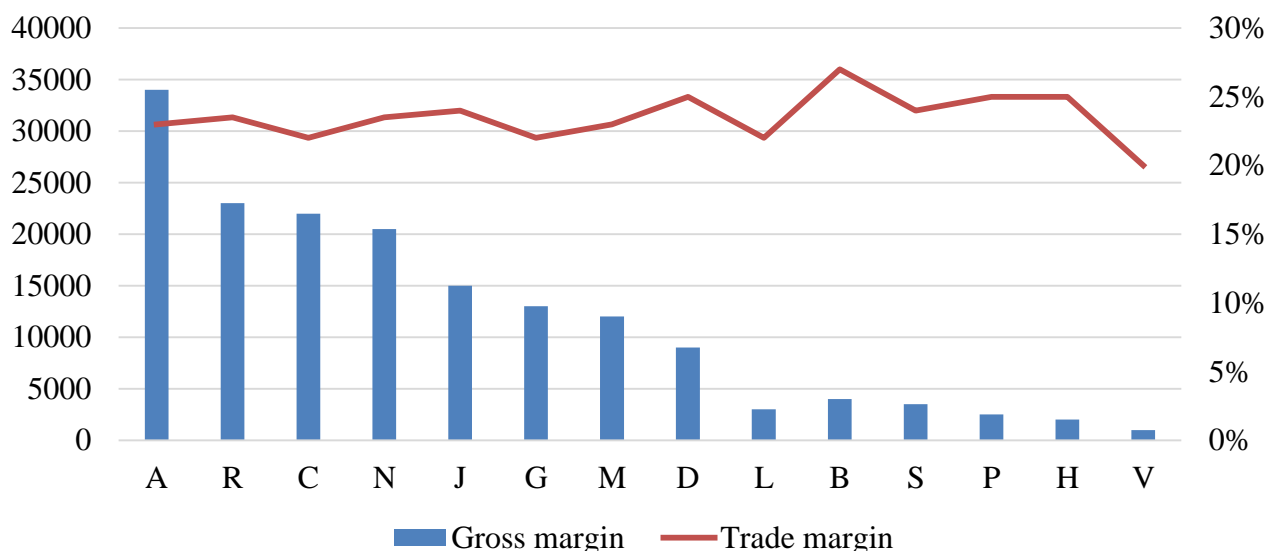


Fig. 4. Structure of the margin of the investigated AM and the weighted average trade margin of medicines in the context of ATC classification of the first level in the first half of 2017

Comparison of the dynamics of pharmacy sales volume for the first half of 2017 indicates that group H «Hormonal drugs for systemic use (except for sex hormones and insulins)» has stable demand and characterized by high profitability and turnover.

It was concluded on the basis of the obtained results that the research AM is recommended to pay special attention to the commodity stocks of such PC: code A, code C, code R, since these groups provide the maximum profit of the studied PN.

An analysis of the sales volume of a PN for the first half of 2017 made it possible to establish that the category that promotes the maximization of sales is Group A «Means that affect the digestive system and metabolism».

The analysis also showed that the category, characterized by a large share in the total marginal profit and high level of surplus, is the group R «Tools for the treatment of diseases of the respiratory system». As a result of the analysis of the average weighted cost of one package of drugs in the studied PN, it was found that the most valuable are preparations of group G «Medications for the treatment of diseases of urogenital organs and sex hormones». To the category of drugs with not high prices – refers to group N «Means for the treatment of diseases of the nervous system».

Subsequently, using the proposed algorithm, the role of each group of drugs was determined in accordance with its influence on the achievement of PN goals. So, in order to increase the profit of the PN, the management should expand the assortment of such PC, such as: A, C and R, because they bring the highest marginal income PN. It is important to control the commodity stocks, in order to keep existing consumers and attract new ones, of such PC – A: means that affect the digestive system and metabolism; B – means that affect the blood system and hemopoiesis; C – means for the treatment of diseases of the cardiovascular system; D – means for the treatment of skin diseases; G – means for treatment of diseases of urogenital organs and sex hormones; H – hormonal medicines for systemic use (except for sex

hormones and insulins); J – antimicrobial medicines for system use; M – means for the treatment of diseases of the bone and muscular system; N – means for the treatment of diseases of the nervous system; R – means for the treatment of diseases of the respiratory system.

We considered the structure of the assortment of each PC in the studied PN and compared with the PC in the city as a whole after determining the role of each of the categories in achieving the strategic objectives of the PN. Groups R, G and H in the studied PN are represented by the trade names that are present in the assortment in the city as a whole. Table 1 shows an analysis of sales in the PN, pharmacies in the Kharkiv city and in Ukraine as a whole on the example of group V «Other medicines" for the first half of 2017. There are 17 trade names of 46 in the studied PN for group V «Other medicines", which are presented in the pharmaceutical market of Ukraine. The largest sales for this group are observed on the following PC: water for injections, Llymphomyot and Glycosim.

The fourth stage of the proposed algorithm of implementation CM is the study of demand for each PC and its internal filling, and an assessment of the current state of the category, its structure and the definition of possible changes in the assortment in the future (Table 1). According to the results of the study, it was found that V group «Other medicines» PN should pay attention to the filling of the product's assortment with the following drugs: Calcium Folate, Custodiol, Ketosteril, Tomoskan, Tomovist, Trazograf, Urographin, Uromitexan in order to increase consumer loyalty to the pharmacy and increase profit of PN (the studied PN is the leader in sales volumes in the Kharkiv region and Kharkiv). As a criterion for adding medicines to the PN assortment, we have chosen: sales volumes in the city of Kharkiv more than 20 thousand UAH for a year and more than 500 thousand UAH in Ukraine as a whole.

It is determined based on the analysis of the assortment of category A, in particular the subgroups A16A X01 «Acid Tioctova», that in the studied PN, it is represented by 5 drugs, which are characterized by a small amount of sales in monetary terms. In the city as a

whole, this group is represented by 6 drugs. The largest volume of sales in this group for Kharkiv is provided by the Tiogammamedicine («WoerwagPharma» (Germany)), which is absent in the assortment of the studied PN.

It was established that the assortment of N group, including directly subgroup N06B X20 «Other psychostimulating and nootropic agents» in the studied PN is represented by only one medicine.

Table 1

Analysis of sales in the studied PN, pharmacies of Kharkiv and in Ukraine as a whole on the example of Group V «Other medicines» for the first half of 2017

ATC code (1)	Number of trade names of medicines Brand	For studied PN		For city Kharkiv		For Ukraine	
		Number of packages	Amount (thousand UAH)	Number of packages	Amount (thousand UAH)	Number of packages	Amount (thousand UAH)
V «Other medicines»	ACD-A	0.00	0.00	1	0.03	4	0.95
	ACIZOL	0.00	0.00	1	0.15	12	3.69
	ALLERGEN TUBERCULAR	0.00	0.00	10	9.44	242	226.45
	AQUA PRO INJECTIONIBUS	16615	233.17	83073	1165.89	1 993 742	27 981.30
	BAR-VIPS	0.00	0.00	21	0.81	510	19.43
	BARIUM SULFATE	1130	27.5	5651	137.50	135 632	3 300.17
	CALCIUM FOLINAT	12	6.37	61	31.85	1 470	764.40
	CALCIUM FOLINATE	0.00	0.00	29	10.29	684	250.15
	CUSTODIOL	0.00	0.00	31	112.79	748	2 707.02
	DALISOL	0.00	0.00	1	0.07	2	0.16
	DELTALICIN	7	8.93	35	44.69	829	1 072.65
	GADOVIST	0.00	0.00	1	3.23	30	77.52
	GLUCOSUM	1905	9.39	9524	46.96	228 577	1 127.04
	HUNYADI JANOS	74	6.90	368	34.51	8 836	828.42
	IOMERON	0.00	0.00	1	0.21	7	4.92
	KETOSTERIL	0.00	0.00	18	41.72	431	1 001.46
	LEUCOFOSIN	25	7.442	124	37.21	2 981	893.06
	LEUCOVORIN	67	13.89	333	69.48	7 984	1 667.73
	LYMPHOMYOSOT	3073	602.98	15365	3014.92	368 747	72 358.11
	MAGNEVIST	0.00	0.00	4	2.98	92	71.57
	MAGNILEK	0.00	0.00	0.00	0.00	1	1.77
	METHIONINUM	472	8.97	2361	44.88	56 663	1 077.26
	MULTIHANS	0.00	0.00	1	0.06	3	1.59
	NALOXONUM	0.00	0.00	82	7.55	1 9573	181.38
	OMNIPAQUE	4	18.41	20	92.08	473	2 210.09
	OMNISCAN	0.00	0.00	0.00	0.00	1	4.49
	OPTIREY	0.00	0.00	0.00	0.00	1	1.36
	OXYGENUM	0.00	0.00	0.00	0.00	5	0.88
	PAMIREY	0.00	0.00	0.00	0.00	2	0.64
	PLACENTA COMPOSITUM	38	17.51	189	87.59	4 534	2 102.28
	PROTAMIN	0.00	0.00	18	4.45	441	106.81
	SODIOFOLIN	0.00	0.00	2	1.17	34	28.23
	SODIUM THIOSULFATE	1053	37.91	5266	189.58	126 375	4 550.03
	TOMOHEXOL	92	49.56	460	247.80	11 039	5 947.20
	TOMOSKAN	0.00	0.00	19	11.40	459	273.72
	TOMOVIST	0.00	0.00	101	60.68	2 417	1 456.41
	TRAZOGRAF	0.00	0.00	66	36.33	1 580	871.96
	TRIOMBRASTUM	143	69.67	717	348.38	17 214	8 361.20
	TUBERCULINE	233	30.01	1163	150.06	27 901	3 601.64
	TURUSOL	41	6.80	205	34.015	4 920	816.36
ULTRAVIST	8	29.46	42	147.31	1 006	3 535.44	
UNIPAQUE	0.00	0.00	22	6.58	535	158.00	
UROGRAPHIN	0.00	0.00	36	40.29	871	967.07	
UROMES	0.00	0.00	1	0.04	6	1.06	
UROMITEXAN	0.00	0.00	8	13.01	198	312.29	
VISIPAQUE	0.00	0.00	0.00	0.00	7	22.24	
ZOREX	0.00	0.00	163	9.15	3 919	219.80	

In the city as a whole, this subgroup is represented by 4 drugs. The largest sales in the city were recorded for the drug Korteksin (Gerofarm, Russia), which is absent in the assortment of the studied PN. Analysis of subgroup N07X X10 "Other means acting on the nervous system. Different medicines», which determined that in the studied PN, it presented of 10 medicines, the volume of sales of which is small. In the city as a whole, it is represented by 11 medicines, among which the greatest volume of sales is provided by Citoflavin (Poligan, Russia), which is also absent in the investigated PN. Thus, the use of the proposed algorithm has made it possible to prove the necessity of changing the assortment in the PN, by introducing certain medicines that provide the highest sales in their categories in Kharkiv, and exclude items that are not in demand in both as in the PN and in Kharkiv as a whole. So, for group V, "Other medicines" PN was proposed to exclude from the assortment of such drugs: Omnipaque, Deltalycin, Ultravist, because they are not in demand in the PN as well as in the city as a whole: their sales for the first half of 2017 were 4; 7; and 8 packages for PN; and 20, 35 and 42 respectively in Kharkov.

The next stage of the algorithm of implementation CM is the optimization of the categories of the entire chain of product movement from procurement and the formation of inventory to direct sales. It should be noted that an important aspect of CM is the optimal distribution of retail space for different categories of pharmaceutical products. Of course, if the product group is correctly formed and laid out on the shelves of the pharmacy, it contributes to the increase in sales of drugs that are part of it. Distribution of retail space should be based on the objectives of the PN. If you want to increase the turnover of a pharmacy, it is necessary to place the medicines

belonging to group A in accordance with the rules of merchandising at a more advantageous place in the trading hall. If it is necessary to maximize profits in the PN, move the group R to this location, since it provides the most significant margin revenue. Thus, the management of the calculation of commodity groups in the PN should also be solved on the basis of CM.

Under the conditions of implementation of the CM in the activity of PN for a more detailed analysis of the assortment, there is a need to analyze sales within each category. However, this kind of work involves the processing of a large array of data. For regular high-quality its implementation, PN should be set up appropriate information software.

Consequently, conducted researches have shown that CM is undoubtedly an effective approach to management of assortment's policy. And if the transition to the management assortment of PC on a regular basis, PN will be able to use the full benefits of the CM methodology and achieve higher rates of sales and profits.

7. Conclusion

1. It is proved that categorical management is a promising tool for managing assortment policy of the PN, which allows determining the groups of medicines that will best achieve certain PN goals and flexibly adapt to changes in demand and market conditions.

2. As the results of the proposed algorithm of CM implementation have been shown, it allows to balance the product assortment in the PN, reduce the number of illiquid commodity positions, optimize inventory and increase profitability of sales, and also make sound management decisions aimed at confronting all kinds of external influences and achieving PN leadership in accordance with set strategic goals.

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DESIGN OF THE TECHNIQUE OF QUANTITATIVE DETERMINATION OF THE BIOLOGICAL ACTIVE SUBSTANCES IN THE EXTRACT OF A BUPLEURUM AUREUM IN THE COMPOSITION OF A COMBINED DOSAGE FORM

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На сьогодні все більшого розповсюдження набувають комбіновані лікарські засоби. Поєднання активних фармацевтичних інгредієнтів необхідно для підвищення терапевтичного ефекту або скорочення терміну лікування, або запобігання можливих ускладнень.

Метою роботи – є розробка методики кількісного визначення біологічно активних сполук сухого екстракту ласкавцю золотистого у складі комбінованої лікарської форми сиропу у суміші з лоратадином.

Методи. Ідентифікацію флавоноїдів в екстракті здійснювали методом ВЕРХ. Для визначення кількісного вмісту речовин флавоноїдної будови використовували метод абсорбційної спектрофотометрії у видимій ділянці спектру, який базується на утворенні забарвлених комплексів флавоноїдів з розчином алюмінію хлориду у кислому середовищі.

Результати дослідження. У результаті проведених досліджень розроблено спектрофотометричну методику кількісного визначення суми флавоноїдів у комбінованому сиропі з лоратадином та екстрактом ласкавця сухим. Методом ВЕРХ визначено флавоноїди, що містяться в екстракті. Отримані забарвлені комплекси спиртових вилучень із сиропу після реакції взаємодії з розчином алюмінію хлориду в оцтовокислому середовищі характеризувалися наявністю максимумів поглинання за довжини хвилі 412 нм. Вплив фонового поглинання є незначущим $\delta_{\text{noise}}=0,25\% \leq \max \delta=0,51\%$. Вивчені валідаційні характеристики методики свідчать про лінійну залежність кількості суми флавоноїдів у перерахунку на рутин в діапазоні концентрації екстракту ласкавцю золотистого в сиропі від 80 % до 120 %, так як величина коефіцієнта кореляції (r) складає $0,9999 \geq 0,9981$; кутовий коефіцієнт лінійної залежності (b) дорівнює $0,9947$, вільний член лінійної залежності (a) – $0,52 \leq 1,60$. Методика прецизійна, оскільки значення відносного довірчого інтервалу менше критичного значення для збіжності результатів: $\Delta\% = 0,37 \leq 2,60$ і виконується критерій незначущості систематичної похибки $\delta=0,01$.

Висновки. Методом ВЕРХ встановлено наявність у сухому екстракті надземної частини ласкавцю золотистого речовин флавоноїдної будови, що спонукало до стандартизації діючої речовини у сиропі за сумою саме цих біологічно активних сполук. Розроблено спектрофотометричну методику кількісного визначення у видимій ділянці суми флавоноїдів у перерахунку на рутин у комбінованій лікарській формі у вигляді сиропу у присутності іншого діючого інгредієнту лоратадину

Ключові слова: Ласкавець золотистий, сироп, хімічний склад, флавоноїди, спектрофотометрія у видимій ділянці, ВЕРХ

1. Introduction

Scientists call allergies, due to their excessive prevalence, as the epidemic of the XXI century. The number of patients with allergies increases every year, in particular in Ukraine. Symptomatic drug therapy for allergy is usually carried out by blockers of H1-histamine

and serotonin receptors, glucocorticoids, membrane stabilizers and anti-mediators, and others [1].

Today, increasingly, for the treatment of allergic manifestations, plant-based products are used, which can be conditioned by an increase in the interest of the population in preparations based on plant material and