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# SUBSTANTIATION OF THE METHODOLOGY OF ASSESSING THE LEVEL OF CUSTOMER SERVICE OF PHARMACEUTICAL COMPANIES

## ABSTRACT

The article substantiates the relevance of customer service of pharmaceutical companies in view of the requirements of quality management standards and the specificity of medicines as a commodity. The insufficiency of theoretical and methodological elaboration of this issue in the scientific literature is proved. Some aspects on which researches were carried out, in particular in pharmacy are defined. The purpose of the study was to substantiate approaches to assess the level of customer service of pharmaceutical companies. An analysis of the factors in the interaction of drug manufacturers and their clients that cause dissatisfaction and termination of relations was conducted. It was found that among the non-price factors the most important are the factors of dissatisfaction with the level of service, namely dissatisfaction with the service life, improper storage of medicines, and low level of documentation of delivery. The functional directions of assessing the level of customer service of manufacturing pharmaceutical companies were determined - the quality of supplies, commercial services, transport and warehousing services, and information services. For each of the selected functional areas, a system of local evaluation indicators was selected by multi-stage filtering through questionnaires and correlation-regression analysis. The study proposes to use taxonomic analysis as a tool for assessing the level of customer service, the advantage of which is the aggregation of a large array of information and simplicity of results interpretation. Based on the proposed developments, an assessment of the level of customer service of the leading pharmaceutical companies of Ukraine - JSC «Farmak», JSC «Biolik», JSC «Lekhim», LLC FC «Health», PJSC «Chimpharmzavod «Red Star». It is established that the state of customer service in the studied domestic pharmaceutical companies is quite different, as the value of taxonomic integrated indicators ranges from 0.6 to 0.8. The article also proposes a scale for assessing the level of customer service by the value of the integrated indicator.

**Keywords:** service, pharmaceutical company, medicines, level of service, logistics service, taxonomic analysis, customer satisfaction, partnerships

**JEL Classification:** L14, L65

## INTRODUCTION

Given the social significance of pharmaceutical products, the mission of pharmaceutical market players should be to provide the population with effective, safe, high-quality and affordable medicines.

However, the functioning in the market conditions characterized by intensified competition, a saturation of the pharmaceutical market, pressure from foreign competitors, strict regulation by the state, high requirements of good practices and international quality standards make pharmaceutical companies (FC) to find new ways to form competitive advantages and increase sales volumes to ensure long-term development.

Under these conditions, the problem of finding ways to achieve a balance of interests between meeting the needs of end users of medicines and ensuring the commercial interests of pharmaceutical market players involved in the creation, production and sale of pharmaceutical products becomes particularly relevant.

The world practice and the best national experience show that in the conditions of highly competitive markets, which traditionally include the pharmaceutical market, ensuring competitive advantages in the long term is possible under the conditions of creating effective chains based on mutually beneficial partnerships between its participants.

The establishment of effective pharmaceutical chains and ensuring the functioning of all their participants on the basis of partnership, i.e. trust, information transparency, reliability, and coordination of goals and interests is one of the possible ways to form an effective system of drug supply in Ukraine, a condition for establishing a unified balanced pricing policy, reducing the threat of counterfeit medicines penetration into the market.

At the same time, the establishment of partnership ensures better control of costs, and acceleration of inventory turnover, which contributes to the realization of commercial interests of pharmaceutical market participants and creates the basis for their sustainable socio-economic development.

One of the promising tools for establishing partnerships between drug manufacturers and their customers is the organization of the service process.

However, a prerequisite for improving any process is to assess its current state. One of the most important stages in the development and adoption of strategic decisions to improve the activities of manufacturing pharmaceutical companies is the diagnosis of the existing state of their main processes.

Taking into account the analysis, we can conclude that there is no unified approach to assessing the state of customer service of FC. Therefore, there is a need to develop a reasonable system of indicators that will allow to comprehensively assess the existing level and diagnose weaknesses and reserves of service development.

Since quality service in the link «FC-producer – client» is the key to building long-term effective partnerships, improving approaches to diagnosing the state of customer service at the same time is one of the promising areas of partnership management [4, 7].

## LITERATURE REVIEW

Such domestic scientists as I. V. Pestun and Z. M. Mnushko [12], O. A. Meh [8] and others were engaged in the problems of research of the pharmaceutical market and its impact on the economic foundations of the country's development. In their scientific works, these scientists studied the principles of investment and innovation development of the Ukrainian pharmaceutical market.

The prospects of distribution in the pharmaceutical market of Ukraine are outlined in the work of A. Y. Mogilov and Y. D. Grigolay [9].

The issues of service in various links of the supply chain have been widely studied in the works of domestic scientists Gromovik B.P., Posylkina O.V., Sagaidak-Nikitiuk R.V. [1, 16]. Modern trends in the development of logistics and logistics integration in pharmacy are revealed in the works of O. V. Posylkina, A. G. Lisna, V. G. Kotlyarov and O. V. Litvinova [15].

Building relationships between FCs and suppliers of substances and materials, as well as inventory management of pharmaceutical production on the basis of logistics, was investigated in [16].

Establishing the activities of the FC, taking into account the process approach in various links of the pharmaceutical supply chain using IDEFO-modeling, is widely covered in the research of V. V. Trokhymchuk [20].

The issue of rationalization of the organization of pharmaceutical care and logistics services for the patient was carried out in [5].

The analysis led to the conclusion that despite a fairly wide range of studies on the management of the pharmaceutical market, the issue of methodological approaches to assessing the state of customer service in pharmacy has not been conducted.

## AIMS AND OBJECTIVES

However, it should be noted that the problem of a comprehensive assessment of the state of service in pharmacy, in particular in such a chain as «production FC - the client», taking into account the requirements of international quality standards has not been studied so far.

Analysis of scientific sources shows that the use of comparative methods in the assessment and diagnosis of customer service is quite common [7].

Note that all existing systems of indicators for assessing the level of service are universal for most enterprises, and producers of consumer goods. Taking into account the specifics of the pharmaceutical industry, the formation of a system of indicators for level assessment requires significant adjustment and inclusion of indicators that can characterize the parameters inherent only in the service of the FC clients. For example, the list of indicators for assessing the level of customer service of manufacturing FC must include indicators that characterize the completeness of the documentation of the supply of medicines (drugs) (especially the availability of quality certificates), indicators that characterize compliance with appropriate conditions of storage and transportation of drugs, indicators of conformity of the secondary packaging to the supplied dosage form of the drug, etc.

Given the need for sound management decisions to develop customer service to build effective partnerships, the aim of the article is to substantiate the method of assessing the actual level of customer service of manufacturing pharmaceutical companies, taking into account the specificity of drugs as a product, the functioning of pharmaceutical markets, responsibilities and requirements of good practices regarding the conditions of storage, transportation and transfer of drugs to the FC clients.

## METHODS

Customer service in the study is considered as a complex concept that has a hierarchical structure. Levels and directions of service are described by functional dependencies based on specific local indicators. The authors propose to use the taxonomic method for the assessment, taking into account the possibility of aggregating a large number of indicators, and ease of interpretation of the results.

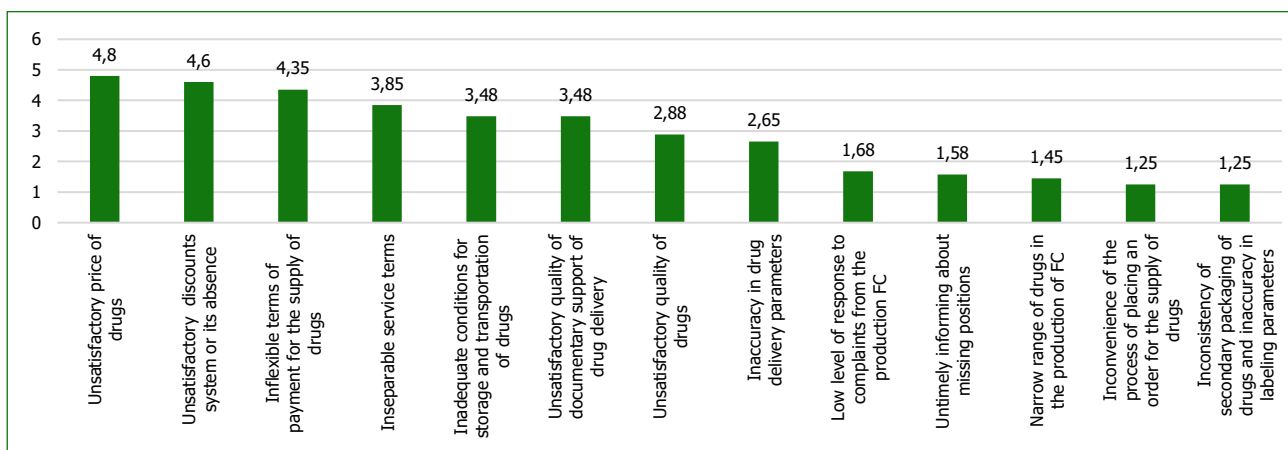
The process of selecting local indicators is proposed to be carried out in three stages. The first filtering of indicators was carried out by the method of critical analysis of scientific literature sources. At the stage of the second selection, the method of expert survey was used, which allowed the narrowing of the number of indicators. To check the reliability of the results obtained (consistency of expert's opinions), the concordance coefficient was used. Its value in the conducted research is more than 0.9. In the last third stage of the selection of indicators, correlation analysis was used to exclude from the final list of indicators that have a high degree of correlation.

The study calculated 19 indicators of local assessment of the state of logistics services for the period from January 1, 2017, to December 31, 2021, for five leading pharmaceutical companies in Ukraine.

## RESULTS

The analysis of relations in the link "production FC-client" highlighted that the main obstacles to the development of the partnership are price factors, which is an understandable factor in a competitive market.

Most of the non-price factors relate to the inefficiency of logistics, namely the level of service (Figure 1).

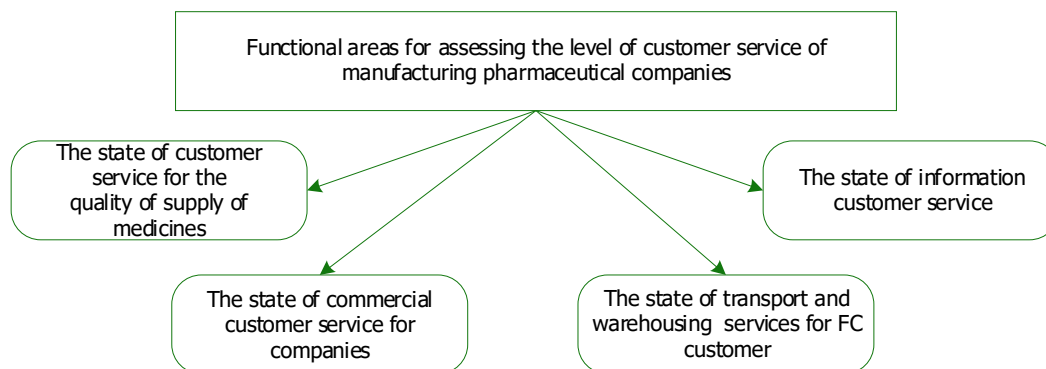


**Figure 1. Histogram of distribution of the reasons influencing the termination of customer relations with the production FC by significance.**

All these reasons cause the subjective dissatisfaction of clients of the domestic production FC with the level of services provided, which requires the development and implementation of optimization measures for further development of the service.

However, the adoption of sound management decisions in the field of improving customer service FC requires justification of priority areas for corrective, optimization measures and the development of methods for assessing the current state of the process.

Based on the results of research and taking into account the requirements of international quality standards and good practices for the storage, transportation, and transfer of drugs, it is proposed to assess the level of customer service production FC in the areas demonstrated in Figure 2:



**Figure 2. Directions for assessing the level of customer service of the FC.**

1) service of the FC clients on the quality of delivery of medicines consists of an assessment of the availability of the stocks of ready medicines for the client of the FC (as may be necessary), observance of required parameters of delivery concerning volume, range, quality of medicines;

2) commercial service, which consists in satisfying the financial side of the service related to the provision of trade credits, discounts, deferred payments for the supply of drugs;

3) transport and warehousing services, which reflects the level of compliance by the production FC with the proper conditions of storage, transportation and transfer of drugs to the client, provided by the rules of GDP and GSP. This direction of assessment is largely concerned with the physical movement of drugs from the manufacturer to the client.

Impersonal customer service commences from the moment when the produced drugs are in the warehouse of the production FC. The value of the order for the client, which is created in the supply chain, will ultimately depend on the proper storage conditions in the warehouse and ensuring the appropriate level of transportation and transfer of drugs;

4) information service for the FC clients, which characterizes the state of transparency in the movement of drugs, the convenience of communication between the manufacturer and its clients during the preparation and implementation of orders, completeness and accuracy of documents required for the realization of drugs.

For each of these areas, a system of evaluation indicators was selected by three-level filtering.

In the first stage, a list of traditional local indicators that are most common in the scientific literature was selected, which was supplemented by indicators that reflect the specifics of customer service in the pharmaceutical industry, which is due to the characteristics of drugs as a socially important product and quality standards. The next stage was a survey of experts on the feasibility of using the indicators formed in the first stage to assess the level of service. In order to determine the consistency of experts' opinions, a concordance coefficient of 0.91 was used. This indicates a high level of consistency of expert opinions.

In order to form a final list of indicators for assessing the level of customer service at the final stage, the pairwise correlation coefficient was calculated and those whose pair correlation coefficient with most other indicators was more than 0.8 were excluded from the list of indicators selected by experts.

The proposed system of local indicators for assessing the level of customer service FC is provided in table. 1.

**Table 1. The suggested list of indicators for assessing the level of customer service of the production FC.**

Name of indicator	Characteristics of indicator
<b>Complex indicator of the FC customer service by the quality of drug deliveries, Kp</b>	
Indicator of the quality of drug delivery to the FC clients by assortment (P <sub>1</sub> )	Demonstrates the share of executed orders for the supply of drugs with strict compliance with the assortment items in the customer's application in the total number of drugs delivered during the reporting period to the FC customers (growth of the indicator is a positive trend)
Indicator of the quality of drug delivery to the FC clients by volume (P <sub>2</sub> )	Demonstrates the share of executed orders for the supply of drugs with exact compliance with the number of pieces (packages) of drugs according to the client's application in the total number of drugs delivered during the reporting period to the FC clients (growth of the indicator is a positive trend)
Indicator of the level of complaints from the clients of the production FC (by quality of drugs) (P <sub>3</sub> )	Demonstrates the share of executed orders for the supply of drugs, after delivery to the customer for which received claims for the quality of the production FC, which were in the supply of the total number of drugs delivered during the reporting period to the FC clients (growth of the indicator is a negative trend)
Indicator of flexibility of terms of delivery of drugs to the FC clients (P <sub>4</sub> )	Demonstrates the share of orders for the supply of drugs, performed at the request of the client with special parameters of packaging or configuration of drugs, delivery times, etc. in the total number of deliveries of drugs made during the reporting period to the FC clients (growth of the indicator is a positive trend)
Indicator of the average level of the FC defect (P <sub>5</sub> )	Characterizes the share of drugs in the assortment of the FC, which received purchase orders from the clients (however, the supply of drugs for these items did not take place for objective reasons not related to service) in the total number of drug items produced by the FC during the reporting period (growth of the indicator is a negative trend)
<b>Complex indicator of commercial customer service of the FC, Kk</b>	
Indicator of the level of trade credit to the clients of industrial FC (K <sub>6</sub> )	Demonstrates the share of deliveries of drugs to the FC clients that were issued as a commodity loan in the total number of deliveries of drugs to the FC clients during the reporting period (growth of the indicator is a positive trend)
Indicator of the level of providing commercial discounts to the FC clients (K <sub>7</sub> )	Demonstrates the share of deliveries of drugs to customers of the production FC, which were made with a discount in payment in the total number of deliveries of drugs made during the reporting period to clients of the FC (growth of the indicator is a positive trend)
Indicator of variability of forms of payment for delivery of produced drugs to the FC clients (K <sub>8</sub> )	Demonstrates the share of deliveries of drugs to the clients of the production FC, which were made with the possibility of the customer to choose the form of payment in the total number of deliveries of drugs to the clients of the FC during the reporting period (growth of the indicator is a positive trend)
Indicator of the level of calculation discipline by the production FC (K <sub>9</sub> )	Demonstrates the share of invoices for the delivery of drugs issued to the clients in a timely manner in the total number of invoices issued to the clients of the FC (growth of the indicator is a positive trend)
<b>Complex indicator of transport and warehousing services of the FC, Kts</b>	
Indicator of transport support of drug deliveries to the FC clients (TS <sub>10</sub> )	Demonstrates the share of drug deliveries to the clients of the production FC by own vehicles in the total number of deliveries of drugs carried out during the reporting period to the clients of the FC (growth of the indicator is a positive trend)
Indicator of compliance of vehicles with the special conditions of drug transportation (TS <sub>11</sub> )	Characterizes the share of the FC vehicles suitable for the transportation of drugs that require a special temperature during transportation, protection from humidity, prevention of light, etc. in the total number of vehicles of the production FC fleet (growth of the indicator is a positive trend)
Indicator of accuracy of drug delivery to the FC clients on the spot (TS <sub>12</sub> )	Demonstrates the share of drugs deliveries to the FC clients performed in compliance with the accuracy of the place of delivery in the total number of deliveries of drugs carried out during the reporting period to the FC clients by own transport (growth of the indicator is a positive trend)
Indicator of accuracy of drugs delivery to the FC clients on time (TS <sub>13</sub> )	Demonstrates the share of drug deliveries to the FC clients carried out within the stipulated period (time period) in the total number of drug deliveries carried out to the FC clients by own transport during the reporting period (growth of the indicator is a positive trend)
Indicator of the level of complaints from the FC clients (for damage caused to drugs during transportation) (TS <sub>14</sub> )	Characterizes the number of complaints from the FC clients regarding the quality of delivery (in the case of delivery by the production FC) by the parameters of preservation during transportation of the integrity of packaging, compliance with special conditions of drugs transportation in the total number of drugs delivered during the reporting period (growth of the indicator is a positive trend)
Quality indicator of drug storage conditions in the production FC warehouse (TS <sub>15</sub> )	Characterizes the share of drugs in the warehouse of produced products of the production FC, stored in appropriate conditions, in compliance with the necessary conditions in the total number of produced drugs in storage during the reporting period (growth of the indicator is a positive trend)
<b>Complex indicator of information customer service of the FC, Ki</b>	
Indicator of the process of automation of processing orders of the FC clients for the supply of drugs (I <sub>16</sub> )	Demonstrates the share of applications for the supply of drugs from the FC clients, processed using modern software products, appropriate communication tools in the total number of applications for the supply of drugs from the FC clients (growth of the indicator is a positive trend)
Indicator of information support of the FC client's orders for the supply of drugs (I <sub>17</sub> )	Demonstrates the increase during the reporting period in the number of contacts with the client regarding the processing, preparation, delivery, transfer of the order compared to the previous analysis period
Indicator of processing the order of the FC clients for the supply of drugs (I <sub>18</sub> )	Characterizes the average time spent on processing the order for the supply of drugs in the total amount of time spent on the full cycle of the order of the FC clients for the supply of drugs (growth of the indicator is a negative trend)
Quality indicator of documentary support of drug delivery to the FC clients (I <sub>19</sub> )	Demonstrates the share of drug deliveries to the FC clients who had all the necessary and properly executed documents (goods and transport documents, quality certificates, conclusions of control and analytical laboratories with permission to sell drugs) in the total number of drugs delivered during the reporting period to the FC clients (growth of the indicator is a positive trend)

The final stages of assessing the level of customer service FC is the calculation of complex indicators by areas and integrated service indicator.

The authors propose to use taxonomic analysis for evaluation, given its advantages - the ability to aggregate a large number of indicators, and simplicity of results interpretation.

The functional dependence of complex indicators of customer service of the production FC on the local ones is as follows:

$$Kp = f_1 (P_1; P_2; P_3; P_4; P_5), \quad (1)$$

where  $Kp$  – a complex indicator of the FC customer service by the quality of drug deliveries;  $P_1, P_2, P_3, P_4, P_5$  – relevant components of the complex indicator of the FC customer service by the quality of drug deliveries.

$$Kk = f_2 (K_6; K_7; K_8; K_9), \quad (2)$$

where  $Kk$  – a complex indicator of commercial customer service of the FC;  $K_6, K_7, K_8, K_9$  – relevant components of the complex indicator of commercial customer service of the FC.

$$Kts = f_3 (TS_{10}; TS_{11}; TS_{12}; TS_{13}; TS_{14}; TS_{15}), \quad (3)$$

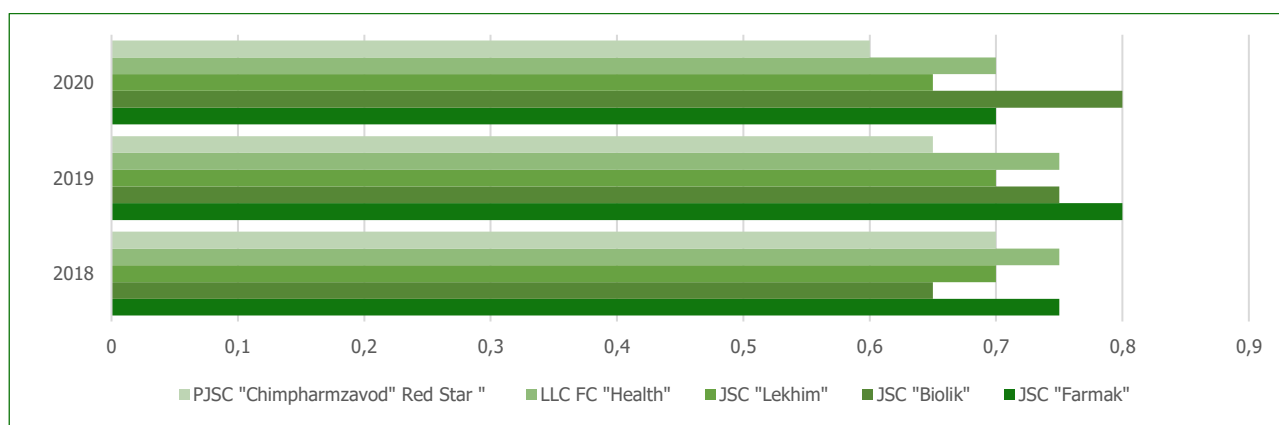
where  $Kts$  – a complex indicator of transport and warehousing services of the FC;  $TS_{10}, TS_{11}, TS_{12}, TS_{13}, TS_{14}$  – relevant components of the complex indicator of transport and warehousing services of the FC.

$$Ki = f_4 (I_{16}; I_{17}; I_{18}; I_{19}), \quad (4)$$

where  $Ki$  – a complex indicator of information customer service of the FC;  $I_{16}, I_{17}, I_{18}, I_{19}$  – relevant components of the complex indicator of information customer service of the FC.

The functional dependence of the integrated indicator of the level of customer service of the FC ( $Is$ ) on the complex indicators by areas can be expressed as follows:

$$Is = f_5 (Kp; Kk; Kts; Ki), \quad (5)$$



**Figure 3. Dynamics of the integrated indicator of the level of customer service of domestic FC.**

Given the results obtained, it can be concluded that the level of customer service at the studied domestic FC is quite different since the value of taxonomic integrated indicators ranges from 0.6 to 0.8.

The proposed scale for assessing the level of customer service of the FC by the value of the integrated indicator has the following quality ranges: from 0 to 0.2 - unsatisfactory level; from 0.21 to 0.4 - the level is lower than average; from 0.41 to 0.6 - the average level; from 0.61 to 0.8 - above an average level; from 0.81 to 1 - a high level of customer service.

Based on the calculations, the level of customer service at any of the studied FC cannot be described as high.

## DISCUSSION AND CONCLUSION

Based on the results of the research, we can draw the following conclusions:

1. Logistics customer service of pharmaceutical companies is an integral part of their overall management. This is due to the specificity of medicinal products as goods, the impossibility of objective assessment of the quality of medicinal products by end users, and the existence of groups of drugs that require specific storage and transportation conditions.
2. The existence of certain imperfections in the relationship between partners in the link "pharmaceutical manufacturer - client" was revealed. The most significant reasons for customer dissatisfaction are in the area of logistics customer service. Namely - unsatisfactory terms and conditions of delivery, violation of the terms of transportation of medicines, and their documentary support. The combined effect of these factors leads to a decrease in the efficiency of the entire supply chain.
3. The article proposes a methodology for assessing the level of customer service in four key areas - the quality of supply of medicines, commercial service, transport and warehouse service, and information. A system of local evaluation indicators has been developed for each of these areas. By the method of taxonomic analysis, a large array of local indicators is aggregated into complex and integral indicators. As a result of the assessment, one integral indicator is calculated for each object under study, which contains data for the entire study period as of the final date of the analysis.
4. The calculations of complex and integral indicators of the level of customer service of the leading Ukrainian FCs have highlighted its insufficiently high level. The calculated indicators vary in the range from 0.6 to 0.8, which according to the proposed scale corresponds to the average and above average levels. Thus, there is a significant reserve for improving the level of logistics services for customers of pharmaceutical companies.
5. The proposed methodology for assessing the state of logistics services for customers of pharmaceutical enterprises takes into account the specifics of medicines as a commodity, as it has specifically selected indicators. The methodology allows for obtaining a reliable result, even for a limited period of time, which is easy to interpret.
6. Taking into account the results obtained regarding the insufficient level of logistics services, the next stage of research in this direction should be the development of specific measures to improve the quality and level of customer service of manufacturing pharmaceutical companies.

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## **ОБҐРУНТУВАННЯ МЕТОДИКИ ОЦІНКИ РІВНЯ ОБСЛУГОВУВАННЯ КЛІЄНТІВ ФАРМАЦЕВТИЧНИХ КОМПАНІЙ**

У статті обґрунтовано актуальність налагодження обслуговування клієнтів фармацевтичних компаній з огляду на вимоги стандартів менеджменту якості та специфічність лікарських засобів як товару. Доведено недостатність теоретико-методологічного опрацювання даного питання в науковій літературі. Визначено окремі аспекти, за якими проводилися дослідження, зокрема у фармації. Метою дослідження стало обґрунтування підходів для проведення оцінки рівня обслуговування клієнтів фармацевтичних компаній. Проведено аналіз факторів у взаємодії виробників ліків та їхніх клієнтів, що викликають незадоволення та припинення відносин. Установлено, що серед нецінових факторів найбільш вагомими є фактори незадоволення рівнем обслуговування, а саме незадоволення строками обслуговування, неналежне зберігання лікарських засобів та низький рівень документального супроводу поставок. Визначено функціональні напрями проведення оцінки рівня обслуговування клієнтів виробничих фармацевтичних компаній – якість поставок, комерційне обслуговування, транспортно-складське обслуговування, інформаційне обслуговування. За кожним із обраних функціональних напрямів обґрунтовано систему локальних показників оцінки, що відбиралися шляхом багатоетапної фільтрації за допомогою анкетування та кореляційно-регресійного аналізу. У дослідженні запропоновано як інструмент оцінки рівня обслуговування клієнтів використовувати таксономічний аналіз, перевагою якого є агрегація великого масиву інформації та простота інтерпретації результатів. Спираючись на запропоновані розробки, проведено оцінку рівня обслуговування клієнтів провідних фармацевтичних компаній України: АТ «Фармак», АТ «Біолік», АТ «Лекхім», ТОВ «ФК «Здоров'я», ПАТ «Хімфармзавод «Червона зірка». Установлено, що стан обслуговування клієнтів у досліджуваних вітчизняних фармацевтичних компаніях досить різний, оскільки значення таксономічних інтегральних показників коливається в межах від 0,6 до 0,8. У статті також запропонована шкала оцінки рівня обслуговування клієнтів за величиною інтегрального показника.

**Ключові слова:** сервіс, фармацевтична компанія, ліки, рівень сервісу, логістичний сервіс, таксономічний аналіз, задоволення клієнтів, партнерські відносини

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