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QUALIFICATION WORK

on the topic: **«ENSURING THE SUSTAINABILITY OF LOGISTICS OF
PHARMACY CHAINS IN CONDITION OF CRISIS»**

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АНОТАЦІЯ

Робота присвячена дослідженню механізмів забезпечення стійкості логістичних систем аптечних мереж в умовах кризових явищ. У ході дослідження ідентифіковано ключові проблемні зони у сфері антикризового управління логістикою аптечних мереж. Розроблено модель проактивного антикризового управління, в основу якої покладено систему раннього попередження ризиків. Робота складається з трьох розділів, викладених на 45 сторінках. Текст містить 6 таблиць, 18 рисунків та список використаних джерел із 30 найменувань.

Ключові слова: стійкість, логістика, аптечні мережі, кризові умови, антикризове управління

ANNOTATION

The study focuses on the mechanisms for ensuring the sustainability of pharmacy chain logistics systems under crisis conditions. Key problem areas in the field of anti-crisis logistics management for pharmacy retail were identified. A model for proactive anti-crisis management was developed, based on an early warning system for risk mitigation. The work consists of three sections across 45 pages and includes 6 tables, 18 figures, and a list of 30 references.

Keywords: sustainability, logistics, pharmacy chains, crisis conditions, anti-crisis management.

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INTRODUCTION

Relevance of the topic. The relevance of the topic is due to a number of systemic challenges that have arisen in the pharmaceutical industries of Ukraine, especially in the context of prolonged military aggression and the postoperative period of the COVID-19 pandemic. The critical role of logistics in ensuring the continuity and quality of medical care makes it a key object for scientific research and practical improvement. Modern pharmacy chains operate in conditions of chronic unpredictability: from a sharp increase in demand to the destabilization of supply chains caused by the destruction of infrastructure, road blockades, and significant currency fluctuations. In these conditions, traditional, inertial models of logistics process management, which are often based on the principles of minimum stocks without adequate reserves, turn out to be ineffective and high-risk. Any disruption in logistics whether it's a delay in critical medicines, a lack of fuel for emergency transport, or problems with medical waste disposal directly threatens the lives of patients and undermines the resilience of the entire healthcare system [5].

The issues of logistics and customer service in pharmaceutical and healthcare enterprises have been considered in the works of many scientists. The issue of improving the organization of medical services using logistical approaches has been studied by both domestic and foreign scientists. At the same time, the issue of increasing the efficiency of the logistics activities of pharmacy chains remains insufficiently disclosed and requires further scientific study [3, 30].

The problem is particularly acute due to the imperfection of the existing anti-crisis management tools adapted to the specifics of the pharmaceutical sphere. The relevance of the research into ensuring the sustainability of pharmacy chain logistics under crisis conditions is determined by the strategic role of the pharmaceutical sector in maintaining public health and national security. In the face of global instability, ranging from economic fluctuations to geopolitical conflicts and pandemics, pharmacy chains face unprecedented challenges that lead to the rupture of supply chains and critical medicine shortages. Traditional "lean" logistics models

have proven insufficient under extreme pressure, highlighting the urgent need for resilient systems capable of adapting to sudden shifts in supply and demand. Furthermore, the transition from reactive to proactive management utilizing early warning systems and risk monitoring is essential to prevent delayed responses to logistical disruptions. Developing mechanisms for sustainability is not merely a matter of economic efficiency but a vital necessity to ensure the continuous availability of essential pharmaceutical products for the population regardless of external shocks. Consequently, this study addresses the critical gap between theoretical anti-crisis management and the practical implementation of robust, sustainable logistics strategies in the modern pharmaceutical retail environment [5].

The purpose of the qualification work is to ensure the sustainability of logistics of pharmacy chains in condition of crisis.

To achieve the goal of the qualification work, it is necessary to solve the following **tasks**:

- to investigate the essence and role of logistical support within the system of functioning of pharmacy chains;
- to characterize the theoretical principles of anti-crisis management;
- to identify the specificity and features of crisis phenomena manifestations in the logistics processes of pharmacy chains;
- to provide an organizational and economic characterization of the pharmacy chain "SLAVUTYCH" pharmacy chain;
- to identify and classify the main crisis threats to the logistical processes of the pharmacy chain "SLAVUTYCH";
- to identify key problem areas in the field of anti-crisis logistics management of the researched network;
- to develop a model of proactive anti-crisis logistics management based on an early warning system;
- to substantiate the implementation of modern information and logistics technologies to increase transparency and efficiency of the logistics system.

The object of the study is logistics processes and their management system in the pharmacy chain "SLAVUTYCH".

The subject of the study is a set of theoretical, methodological and practical aspects of anti-crisis management of the logistics support of a pharmacy chain "SLAVUTYCH", aimed at ensuring the continuity and rationality of the supply of critically important resources.

The study used various **methods**: questionnaires, systems analysis and synthesis, dialectical method; comparative analysis; statistical, analytical and grouping methods; method of expert assessments and classification; modeling method and economic and mathematical methods; methods of economic justification and efficiency assessment.

Practical significance of the obtained results. The practical significance of the obtained results lies in the development of applied tools that enhance the operational stability of pharmacy chains during periods of high uncertainty. The proposed model of proactive anti-crisis management, integrated with an early warning system, provides pharmacy managers with a concrete algorithm for identifying logistical "bottlenecks" before they escalate into critical failures. By implementing the identified risk-monitoring indicators, companies can optimize their inventory levels, diversify supply routes more effectively, and reduce the time required to react to market shocks. Furthermore, the practical recommendations regarding the sustainability of supply chains can be utilized by pharmaceutical retailers to minimize financial losses and ensure the uninterrupted availability of socially important medications. The findings of this study offer a scalable framework that can be adapted not only for the "SLAVUTYCH" pharmacy chain but also for other pharmaceutical enterprises seeking to strengthen their logistical resilience against systemic crises.

Approbation of research results and publication. Qualification work is approved on XI International Scientific and Practical Conference "SOCIAL PHARMACY: STATE, PROBLEMS AND PROSPECTS". Article has been published: Bondarieva I.V., Hniad I. Ensuring the sustainability of logistics of

pharmacy chains under crisis conditions. *Social Pharmacy: Status, Problems and Prospects: Materials of the XI International Scientific-Practical Conference* (April 30, 2026, Kharkiv) / ed. col.: A. A. Kotvitska et al. – Kh.: NUPh, 2026. – P. 601-602.

Structure and scope of the qualification work. The qualification work consists of an introduction, a literature review, an experimental part, generalized conclusions, a list of used literary sources and appendices. The total volume of the work is 45 pages, which contain 18 figures and 6 tables. Also, 30 literary sources were used and analyzed in the work.

CHAPTER 1

THEORETICAL AND METHODOLOGICAL BASIS OF ANTI-CRISIS MANAGEMENT IN LOGISTICS

1.1. The essence and role of logistical support in the system of functioning of pharmacy chains

The contemporary pharmaceutical market is characterized by high levels of competition, strict state regulation, and an increasing demand for high-quality service, which collectively place logistical support at the forefront of a pharmacy chain's operational strategy. The essence of logistical support in this context extends far beyond the simple physical movement of goods; it represents a complex, integrated system of managing information, financial, and material flows to ensure that the right medication reaches the right patient at the right time, in the right condition, and at an optimal cost. In the systemic functioning of pharmacy chains, logistics acts as the "circulatory system," where any disruption in flow can lead to immediate social and economic consequences. The fundamental essence of this process lies in the synchronization of procurement, warehousing, and distribution processes, tailored specifically to the unique requirements of pharmaceutical products, such as temperature sensitivity, expiration date tracking, and compliance with Good Distribution Practice (GDP) standards. Unlike general retail, pharmaceutical logistics is governed by the principle of "zero error," as the quality of logistical execution directly correlates with the therapeutic efficacy of the drugs and, ultimately, the health of the population [1].

The role of logistical support is multifaceted, beginning with the strategic management of supplies. For a pharmacy chain, especially one operating on a large scale like "SLAVUTYCH" the logistical system must balance the paradox of maintaining high stock availability while minimizing frozen capital in overstocked warehouses. This role is increasingly critical because the pharmaceutical assortment is vast, ranging from life-saving emergency medications to high-turnover para pharmaceuticals. Logistical support ensures that the inventory policy is responsive

to seasonal fluctuations, epidemiological shifts, and changes in consumer behavior. By employing advanced forecasting techniques and inventory control models, logistics transforms from a cost-oriented department into a value-generating asset. It provides the pharmacy chain with the agility needed to react to market volatility, ensuring that "out-of-stock" scenarios are minimized, which is the primary metric of customer loyalty in the pharmaceutical retail sector [2].

Furthermore, the essence of logistical support is deeply rooted in the concept of specialized infrastructure. Pharmaceutical logistics requires a sophisticated cold chain management system to handle thermolabile products. The role of logistics here is to maintain a continuous temperature-controlled environment from the manufacturer's warehouse to the pharmacy shelf. This involves not only specialized transport and refrigeration equipment but also a robust monitoring system that provides real-time data on the state of the cargo. In this regard, the essence of logistics shifts toward quality assurance and risk management. Logistical support serves as a protective barrier, ensuring that the chemical integrity and biological activity of medications are preserved throughout the entire transit period. This "safety-first" role distinguishes pharmacy logistics from other industries, making it a highly specialized field that requires specific technical expertise and rigorous adherence to international safety protocols [4].

Transitioning to the organizational level, the role of logistical support in the functioning of pharmacy chains is central to achieving operational efficiency and cost-optimization. In an era of shrinking margins due to state-imposed price caps on essential medicines, pharmacy chains must find internal reserves to maintain profitability. Logistics provides these reserves through the optimization of transport routes, the automation of warehouse operations, and the reduction of logistics-related waste (such as expired or damaged products). By centralizing the distribution process through regional hubs, pharmacy chains can achieve economies of scale, reducing the unit cost of delivery. The essence of logistical support thus becomes a tool for competitive advantage; the chain with the most efficient logistics can offer

more competitive pricing or reinvest savings into expanding its network and improving the customer experience [9].

The integration of information flows is another vital component of the essence of modern pharmaceutical logistics. In a functioning pharmacy chain, the physical movement of medicines is preceded and accompanied by digital data. Logistical support involves the use of sophisticated Information Systems (IS) and Enterprise Resource Planning (ERP) software that link the pharmacy point-of-sale with the central warehouse and the suppliers. This digital essence allows for automated replenishment, where the system triggers a purchase order as soon as stock levels hit a predefined threshold. This reduces the human factor, minimizes errors in ordering, and ensures that the distribution of goods across the network is based on actual demand rather than intuition. Consequently, the role of logistics evolves into an information-analytical function, providing the management with the transparency needed to make data-driven decisions regarding the chain's development and market positioning [12].

Moreover, the role of logistical support is inextricably linked to the social responsibility of the pharmacy business. Pharmacy chains do not merely sell products; they provide a social service. During periods of instability or crisis, the logistical system's ability to maintain the continuity of supply becomes a matter of public safety. The essence of logistics in such times is defined by its resilience and flexibility the ability to quickly reroute supplies, find alternative vendors, and manage "panic buying" through effective distribution control. The logistical system acts as a stabilizer, preventing the collapse of the medication supply even under external pressure. This strategic role reinforces the idea that logistical support is the backbone of the pharmacy chain, supporting not just its economic health but also its reputation as a reliable healthcare provider [14].

In conclusion, the essence and role of logistical support in pharmacy chains represent a synthesis of technical precision, economic optimization, and social commitment. It is an integrated management discipline that synchronizes the physical, financial, and information flows to ensure the maximum efficiency of the

pharmaceutical business. By performing roles ranging from quality guardian and cost-optimizer to information hub and crisis stabilizer, logistical support ensures the long-term viability and sustainability of pharmacy chains in an increasingly complex and volatile global market. The effectiveness of this system determines whether a pharmacy chain can fulfill its primary mission: providing the population with timely and safe access to the medications they need to sustain life and health [30].

The essence and role of logistical support in the system of functioning of pharmacy chains presented in the table 1.1 [4].

Table 1.1

The essence and role of logistical support in the system of functioning of pharmacy chains

| Aspect | Description of the Essence | Strategic Role in Pharmacy Chains |
|--------------------------|--|---|
| Material Flow Management | Systematic control of the physical movement of pharmaceuticals from manufacturers to the final consumer. | Ensures high stock availability and minimizes "out-of-stock" situations for vital medications. |
| Quality & Safety Control | Strict adherence to GDP (Good Distribution Practice) standards and maintaining the "cold chain." | Acts as a guarantor of the therapeutic efficacy and safety of drugs by preventing degradation during transit. |
| Information Integration | Synchronization of real-time data between pharmacy outlets, warehouses, and suppliers. | Facilitates data-driven decision-making, automated replenishment, and transparent inventory tracking. |
| Economic Optimization | Management of logistics costs, including warehousing, transportation, and inventory carrying costs. | Increases the overall profitability of the chain by reducing waste and optimizing operational expenses. |
| Risk Management | Developing adaptive mechanisms to handle supply chain disruptions and market volatility. | Provides sustainability and resilience during crises, ensuring the continuity of the medication supply. |
| Customer Service | Providing the "Right Product" at the "Right Time" and "Right Price." | Builds consumer loyalty and fulfills the social mission of the pharmacy as a healthcare provider. |
| Regulatory Compliance | Alignment of logistical processes with state pharmaceutical legislation and licensing requirements. | Minimizes legal risks and ensures the chain's right to operate in the pharmaceutical market. |

Source: compiled by the author

Based on the established list of factors influencing the formation of supply chains, it is possible to develop a generalized model of factors that determine the strategies for the functioning of these chains (Fig. 1.1).

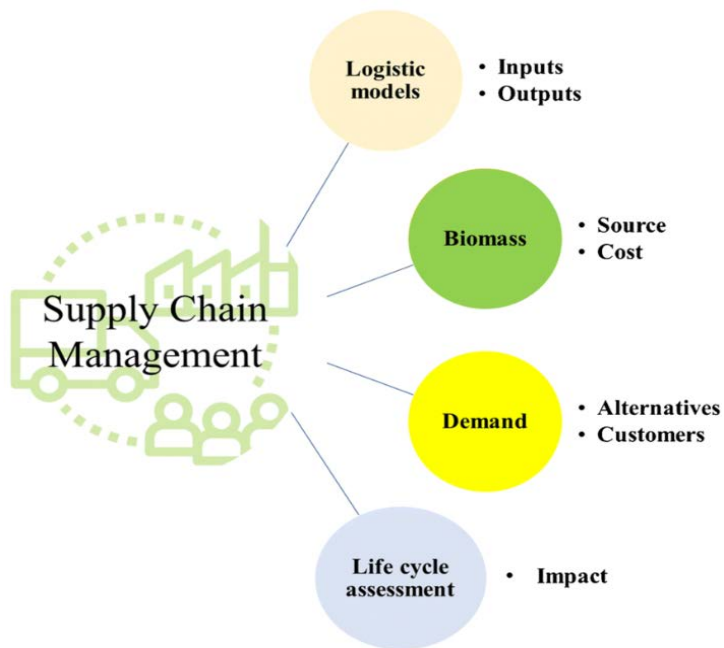


Fig. 1.1. Factors determining the choice of supply chain strategy

1.2. Theoretical foundations of crisis management

Modern business conditions are characterized by a high level of uncertainty, instability of the market environment, and frequent economic, political, and social crises [8]. In such conditions, the problem of anti-crisis management, which acts as an important tool for ensuring stability, competitiveness and sustainable development of enterprises and organizations, becomes particularly relevant. The theoretical substantiation of anti-crisis management allows us to determine its essence, basic principles, goals, functions and stages of implementation [3].

Crisis management is a system of measures aimed at preventing, localizing, overcoming, or minimizing the consequences of crisis phenomena in the activities of an organization [8].

Its main goal is to ensure the viability of the enterprise in the face of internal or external threats. Scientists consider crisis management as a complex activity that

includes strategic planning, monitoring, risk forecasting, change management and adaptation to new operating conditions [8].

Table 1.2 summarizes approaches to defining the concept of “crisis management” in the scientific literature [22].

Table 1.2

Approaches to defining the concept of "crisis management"

| Approach | Focus Area | Core Definition / Concept |
|-------------------------------------|-------------------------|---|
| Functional (process) approach | management cycles | A set of functions or phases (prevention, preparation, response, and recovery) designed to identify, confront, and resolve a crisis. |
| Relational (communication) approach | stakeholder perception | A process of managing the flow of information and maintaining the organization's reputation and relationships with its public during a threat. |
| Strategic approach | long-term viability | An integral part of strategic management aimed at increasing the organization's resilience and its ability to adapt to sudden changes in the environment. |
| Psychological approach | human behavior | Focuses on the perception of threat, stress management, and the decision-making processes of leaders and employees under extreme pressure. |
| Systems approach | internal infrastructure | Viewing a crisis as a "system failure." Management involves redesigning internal systems to prevent a domino effect of errors. |
| Contingency approach | situational context | The idea that there is "no one size fits all" way to manage a crisis; the strategy must be tailored to the specific nature and scale of the event. |

Source : compiled by the author

Anti-crisis management is a system of special measures based on a number of key principles that ensure its effectiveness and manageability in crisis situations [10].

One of the first and most important is the principle of early diagnosis and prevention. It involves constant monitoring of the internal and external environment of the enterprise for timely detection of signs of a crisis at the initial stages, which allows the application of preventive, not only reactive, measures [1].

The next is the principle of flexibility and adaptability of management. It requires the ability of the management system to quickly reorient, change goals, strategies and methods in accordance with the dynamics of the crisis situation and the unpredictability of external factors [5].

The principle of continuity and complexity is also key, which means that anti-crisis measures should not be a single action, but a continuous, integrated process that covers all areas of the enterprise's activity: finance, production, personnel and marketing.

At the same time, the principle of promptness and decisiveness in decision-making is mandatory, since in a crisis, time is a critical resource, and delay can lead to irreversible consequences [3].

An important place is occupied by the principle of responsibility and professionalism of management, which requires the presence of a highly qualified anti-crisis team capable of taking responsibility for complex and often unpopular decisions [4].

The principle of systematicity and scientific involves the use of proven, scientifically sound methods of analysis, forecasting and modeling of crisis processes, as well as considering the enterprise as a single system, where changes in one element affect all others.

The principle of resource provision emphasizes the need for early formation of reserves (financial, material, personnel) for the implementation of anti-crisis programs [8].

All these principles are interrelated and together provide the basis for the sustainability, survival and recovery of an enterprise in conditions of economic instability [7]. Crisis management is implemented in stages, as reflected in Table 1.3.

Table 1.3

Stages of implementing crisis management

| Stage | Phase Name | Primary Objective | Key Activities |
|-------|-----------------------|-------------------|---|
| 1 | Signal Detection | Identification | Scanning the internal and external environment for "early warning signs" of potential trouble. |
| 2 | Prevention & Probing | Risk Mitigation | Conducting audits, vulnerability assessments, and implementing policies to stop a crisis before it starts. |
| 3 | Damage Containment | Response | Activation of the Crisis Management Team (CMT). Limiting the spread of the crisis to other parts of the organization. |
| 4 | Recovery | Normalization | Implementing short-term and long-term programs to return to "business as usual" and restore stakeholder confidence. |
| 5 | Learning & Evaluation | Improvement | Reviewing the response, identifying what went wrong, and updating the Crisis Management Plan (CMP) for the future. |

Source: compiled by the author

The mechanism of anti-crisis management encompasses a set of methods, tools and resources used to overcome crisis situations. Its main components include: organizational and economic mechanism (restructuring, resource optimization, improvement of business processes); financial mechanism (rehabilitation, liquidity management, cost optimization, investment attraction); personnel mechanism (training, motivation, personnel rotation); information and analytical mechanism (monitoring of the external environment, risk management, forecasting) [10].

The interaction of these elements provides a comprehensive approach to crisis management aimed at achieving financial stability and competitive advantages of the enterprise [5].

The theoretical foundations of anti-crisis management are based on systemic, strategic and preventive approaches to enterprise management in conditions of instability [11].

Crisis management is designed not only to overcome the consequences of crises, but also to prevent their occurrence through early diagnosis, flexible response and effective use of resources. In modern conditions, crisis management is becoming a key factor in ensuring long-term stability and development of organizations in various sectors of the economy [5].

CONCLUSIONS TO CHAPTER 1

1. The theoretical and methodological research conducted in this chapter confirms that logistical support is the fundamental core of pharmacy chain operations, acting as the organization's "circulatory system." In the pharmaceutical sector, logistics transcends the simple technical function of moving goods, evolving into a complex integrated system for managing material, information, and financial flows where the primary goal is strict adherence to the "zero error" principle. This is necessitated by the specific nature of pharmaceutical products, which require rigorous compliance with GDP standards and the continuity of the "cold chain" to preserve therapeutic efficacy. The logistical system of a pharmacy chain simultaneously serves as a strategic inventory management tool, a guarantor of product quality and safety, and a key factor in economic optimization, allowing for cost minimization amidst limited profitability and stringent state price regulations.

2. Concurrently, the high level of uncertainty in the modern market environment necessitates the implementation of an effective anti-crisis management system. An analysis of scientific approaches indicates that anti-crisis management is a multifaceted process encompassing functional, strategic, and systemic aspects of enterprise activity. Its essence lies not only in reacting to existing threats but, primarily, in the early diagnosis and prevention of crisis phenomena. Based on principles of flexibility, promptness, and scientific validity, anti-crisis management is realized through successive stages: from detecting weak signals and mitigating risks to containing damage, recovering operations, and subsequent learning based on the experience gained.

CHAPTER 2

ANALYSIS OF THE STATE OF LOGISTICS AND CRISIS MANAGEMENT USING THE EXAMPLE OF THE PHARMACY CHAIN "SLAVUTYCH"

2.1. Organizational and economic characteristics of the pharmacy chain "SLAVUTYCH"

The organizational and economic characteristics of the pharmacy chain "SLAVUTYCH" reflect a complex integration of traditional pharmaceutical retail with modern logistical and management strategies designed to navigate the highly regulated and competitive Ukrainian healthcare market. At its core, the organizational structure of "SLAVUTYCH" is built upon a centralized management model that balances corporate oversight with the operational flexibility required at the individual pharmacy level. This structure allows the network to maintain rigorous quality control standards while responding effectively to the local demand patterns of diverse geographical locations. The administrative headquarters oversees strategic planning, procurement, financial management, and legal compliance, while the regional branches focus on the direct provision of pharmaceutical services and inventory management. This hierarchical yet adaptive framework ensures that the company's mission providing accessible and high-quality medication is consistently met across all its outlets [9].

From an economic perspective, "SLAVUTYCH" operates as a high-turnover retail entity where profitability is closely tied to the efficiency of its supply chain and the breadth of its assortment. The chain's economic stability is grounded in its diversified product portfolio, which includes not only essential medicines and prescription drugs but also a wide range of parapharmaceuticals, medical equipment, and health-and-beauty products. This diversification helps mitigate the risks associated with state-imposed price caps on essential medications, which often limit profit margins on core pharmaceutical products. By leveraging high-margin non-

drug categories, "SLAVUTYCH" maintains a balanced revenue stream, ensuring financial resilience even during periods of economic volatility or shifts in healthcare legislation [7].

A critical component of the chain's economic characteristic is its procurement strategy. "SLAVUTYCH" utilizes a centralized purchasing system that allows it to negotiate favorable terms with both domestic manufacturers and international distributors. By consolidating orders, the network achieves significant economies of scale, reducing the unit cost of products and enhancing its competitive pricing advantage in the retail market. Furthermore, the company invests heavily in its own logistical infrastructure, including specialized warehousing facilities equipped with climate-control systems that meet international Good Distribution Practice (GDP) standards. This logistical autonomy reduces reliance on third-party providers, lowers transportation overheads, and guarantees the integrity of thermolabile products, which is a vital aspect of the chain's value proposition to consumers [2].

The financial health of "SLAVUTYCH" is also characterized by its sophisticated approach to inventory management. Using advanced Enterprise Resource Planning (ERP) systems, the chain monitors stock levels in real-time across all locations. This data-driven approach minimizes the occurrence of "out-of-stock" scenarios, which are detrimental to customer loyalty, while simultaneously preventing the accumulation of excess inventory that ties up working capital. The economic efficiency of the chain is further enhanced by its loyalty programs and digital marketing initiatives, which are designed to increase the average transaction value and ensure high rates of customer retention. In the digital age, "SLAVUTYCH" has also expanded its economic footprint through e-commerce integration, allowing for online reservations and delivery services, thereby capturing a larger share of the modern consumer market.

Organizationally, the human capital of "SLAVUTYCH" remains its most vital asset. The chain implements a rigorous personnel management policy that prioritizes continuous professional development and strict adherence to pharmaceutical ethics. Each pharmacy is staffed by qualified pharmacists and pharmacy technicians who

serve not only as sales associates but as healthcare consultants. This professional approach strengthens the brand's reputation as a trusted healthcare provider, which is an intangible yet crucial economic asset. The organizational culture emphasizes accountability and quality service, with regular performance audits conducted to ensure that all branches meet the high standards set by the central management.

In conclusion, the organizational and economic profile of "SLAVUTYCH" is defined by its systemic integration of professional pharmaceutical expertise with modern business practices. Its centralized organizational structure provides the necessary control for quality assurance and regulatory compliance, while its economic model focuses on cost optimization through logistical efficiency and revenue diversification [3].

By balancing its social mission with economic pragmatism, "SLAVUTYCH" has established itself as a stable and competitive player in the pharmaceutical market, capable of sustained growth and resilience in a complex and ever-changing healthcare environment. The synergy between its logistical capabilities and market-oriented management ensures that the chain remains a cornerstone of the healthcare infrastructure in the regions it serves.

SWOT analysis pharmacy chain "SLAVUTYCH" was conducted (table 2.1).

Table 2.1

SWOT analysis of the pharmacy chain "SLAVUTYCH"

| Strengths (Strengths – S) | Weaknesses (W) |
|---|---|
| <ul style="list-style-type: none"> ▪ A robust, automated distribution model that ensures high inventory turnover and minimizes "out-of-stock" incidents. ▪ Full adherence to Good Distribution Practice standards, particularly in cold chain management for sensitive medications. ▪ High levels of consumer trust built through a "social mission" approach and professional pharmaceutical consultations. | <ul style="list-style-type: none"> ▪ Any disruption at the main regional hub could potentially paralyze the supply chain for the entire network. ▪ Maintaining specialized climate-controlled warehousing and specialized transport is capital-intensive. ▪ If the chain is concentrated in specific regions, it may lack the national scale of larger competitors. ▪ The high stress of pharmaceutical retail can lead to the loss of qualified pharmacists to competitors or other industries |

| | |
|--|---|
| <ul style="list-style-type: none"> ▪ Use of advanced ERP and IS systems for real-time stock tracking and automated replenishment. ▪ Well-positioned outlets in high-traffic areas, ensuring accessibility for the target population. | |
| Opportunities (O) | Threats (Threats – T) |
| <ul style="list-style-type: none"> ▪ Growth of online sales and home delivery services, capturing the tech-savvy demographic. ▪ Introducing "house brands" for parapharmaceuticals to increase profit margins. ▪ Integration into state-funded programs like "Affordable Medicines" to drive foot traffic. ▪ Acquiring smaller, independent pharmacies that lack the resources to implement complex anti-crisis management. ▪ Expanding the customer base through corporate insurance health plans. | <ul style="list-style-type: none"> ▪ Currency fluctuations affecting the cost of imported medications and reducing consumer purchasing power. ▪ Potential changes in state price-capping policies that could further compress profit margins. ▪ Aggressive expansion and price wars from national pharmacy "discounters." ▪ Global logistics crises or local geopolitical instability affecting the timely arrival of international supplies. ▪ Sudden surges in demand (like pandemics) that can overwhelm inventory levels and lead to panic buying. |

Source: compiled by the author

2.2. Identification and classification of the main crisis threats to the logistical processes of the pharmacy chain "SLAVUTYCH"

We conducted a survey of 80 employees of the pharmacy chain "SLAVUTYCH" to assess the state of logistics processes, the level of stability and effectiveness of anti-crisis measures in the health care facility in conditions of military operations and identify key problem areas (Appendix A).

It was found that a wide range of specialists were involved in the survey: the largest share was made up of pharmacists (47%) and heads of pharmacy (32%), 21% of marketers which ensured that assessments were obtained from direct experience of using logistics supplies (Fig. 2.1).

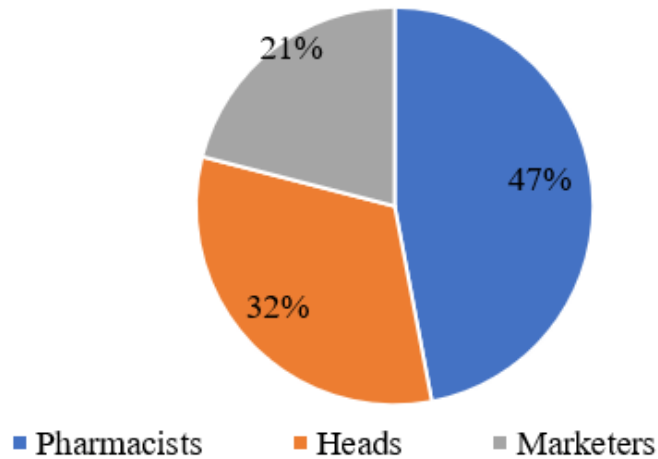


Fig. 2.1. Structure of respondents by position interviewed in the pharmacy chain "SLAVUTYCH"

Next, we analyzed the distribution of respondents by length of service (Fig. 2.2).

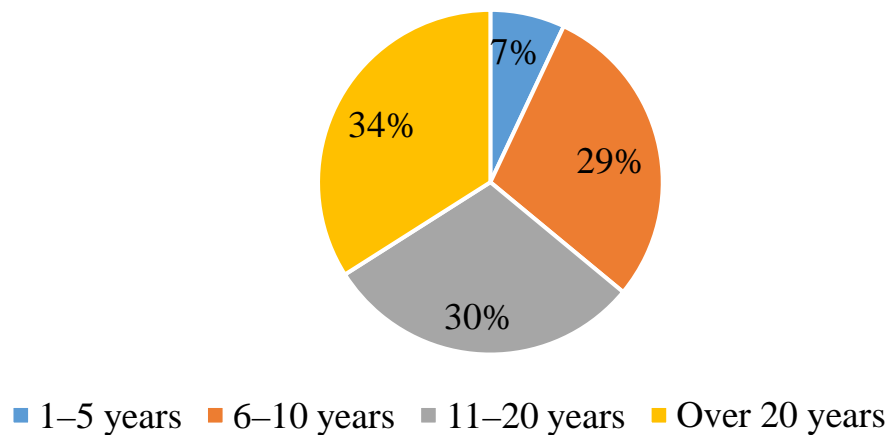


Fig. 2.2 Distribution of respondents by length of service

It was found that among the surveyed employees 64% have more than 10 years of experience, with the largest share (almost a third – 34%) being the group with more than 20 years of experience. Experienced employees with 11 to 20 years of experience make up 30% of respondents, and the group with 6 to 10 years of experience – 29%. The smallest share is among respondents with 1 to 5 years of experience (7%), and there are no employees with less than 1 year of experience

among respondents. Thus, the survey results are based on assessments of mainly qualified and experienced personnel (Fig. 2.2).

It was found that a significant part of the surveyed employees has direct or indirect experience of participation in logistics and/or procurement processes. In particular, almost half of the respondents - 49% responded that they regularly participate in these processes. Experience of episodic participation (options "Sometimes" and "Rarely") was recorded in 46% of the respondents (28% and 18%, respectively).

It was found that only a small portion of employees – 5% indicated that they had never had experience participating in logistics or procurement procedures.

Such a high level of staff involvement in these processes indicates their awareness of supply and resource allocation issues, which increases the reliability of subsequent assessments of logistics efficiency in survey conditions (Fig. 2.3).

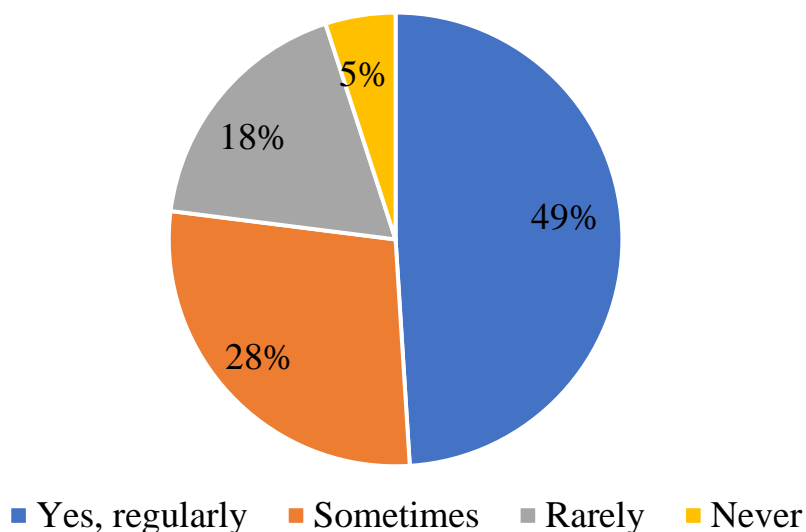


Fig. 2.3 Analysis of the experience of employee participation in logistics and/or procurement processes

It was found that the level of awareness of employees of the pharmacy chain "SLAVUTYCH" with its anti-crisis procedures is mostly satisfactory or good. The majority of respondents (78%) assessed their awareness as "Satisfactory" (30%), "Good" (29%) or "Very good" (19%). At the same time, almost half of the

respondents (48%) consider their awareness to be good or very good. At the same time, a significant part of the staff has gaps in knowledge: 15% of respondents considered their awareness to be insufficient, and 7% stated that they were not familiar with anti-crisis procedures at all. In general, although the level of knowledge is sufficient for the majority, the presence of 22% of employees who are insufficiently or not at all familiar with crisis protocols indicates the need to strengthen training and information work to ensure the institution's full readiness for emergencies (Fig. 2.4).

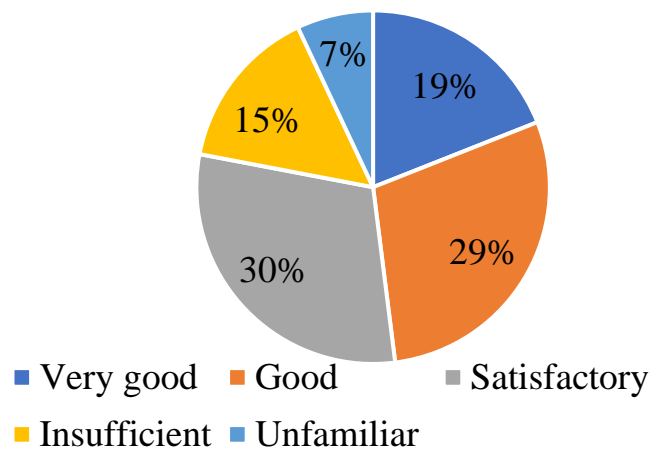


Fig. 2.4. Analysis of the level of awareness of employees with the chain's anti-crisis procedures

In the next stage of our research, we analyzed the key factors influencing supply disruptions during martial law (Fig. 2.5). It was found that among the factors that most influence supply disruptions to a chain during martial law, employees of the pharmacy chain "SLAVUTYCH" identified staff shortages and infrastructure destruction as the most critical problems. The highest indicator – 40% was received by the factor “lack of drivers”, which indicates an acute problem with the logistics personnel necessary for the physical movement of goods. The second most significant factor, noted by 35% of respondents, is the destruction of transport infrastructure, which directly complicates routes and extends delivery times. Less significant, but still significant, are the loss of suppliers (13%) and fuel shortages (12%). This indicates that, despite regional specifics (proximity to the war zone), the

primary disruptions are caused not so much by economic factors (fuel, loss of partners) as by problems with physical delivery and staffing of logistics chains.

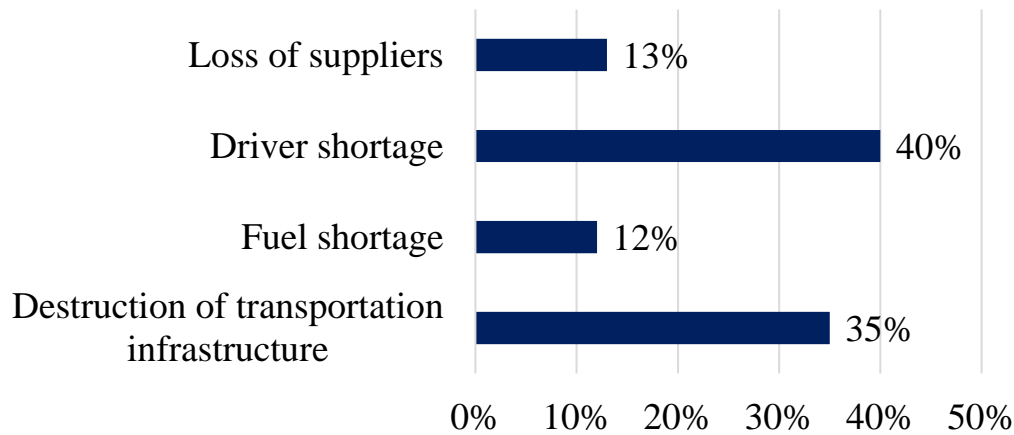


Fig. 2.5. Analysis key factors affecting supply disruptions during martial law

It was found that among the various groups of resources necessary for the functioning of a chain under martial law, employees of the pharmacy chain "SLAVUTYCH" called the shortage of equipment the most critical, which was noted by 32% of respondents.

The second most important group is consumables, the shortage of which is felt by 25% of respondents, which is only slightly more than medical drugs (23%).

The least critical are the shortage of personal protective equipment (14%) and food (6%). Thus, the main supply problems are concentrated in the area of technical support and operational maintenance (consumables), while basic needs, such as medicines and food, are provided relatively more stably compared to the need to update or repair equipment (Fig. 2.6).

It was found that, despite martial law and the associated logistical challenges, the majority of employees of the pharmacy chain "SLAVUTYCH" assess the frequency of critical delays in deliveries as low. The vast majority of respondents (60%) noted that the chain rarely encounters critical delays.

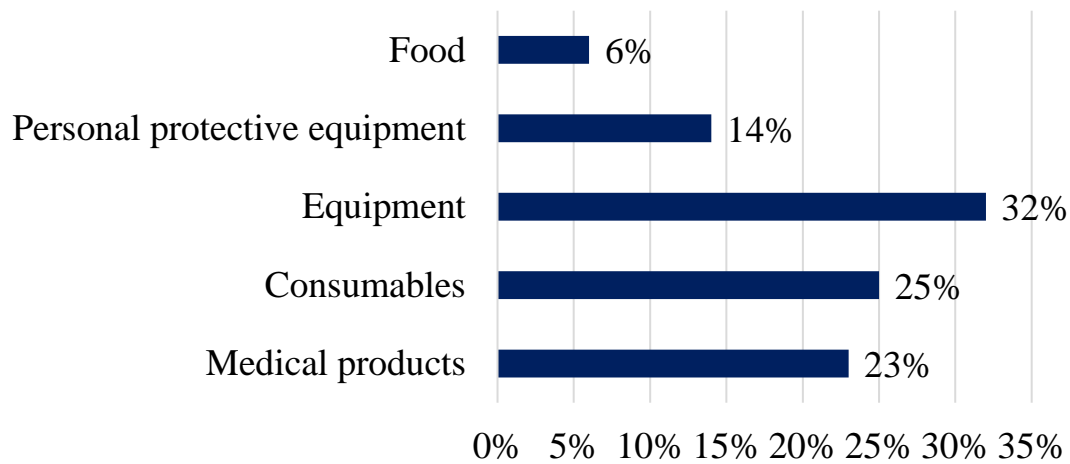


Fig. 2.6. Resource groups most susceptible to shortages during martial law

Another 9% of respondents answered that such delays almost never occur. However, a significant aggregate share of staff (31%) still experiences problems with the regularity of deliveries, indicating that delays occur often (20%) or very often (11%). This indicates the presence of certain local or periodic failures in the logistics chains, although overall the supply system apparently remains quite stable.

During the study an assessment of the most serious threats to logistics processes was conducted by employees (Fig. 2.7).

It was found that employees of the pharmacy chain "SLAVUTYCH" identified physical threats as the absolute most serious risk to the logistics processes of the chain. The vast majority of respondents – 87% indicated that shelling and destruction pose the greatest danger. In contrast, all other types of threats received extremely low ratings: transport and financial threats were selected by 5% of respondents, respectively, while communication (2%) and personnel (1%) threats are considered by the staff as minimal. This distribution demonstrates that, despite the challenges with the driver shortage described in the previous questions, the staff is clearly aware that the immediate military danger (shelling, physical destruction of property and infrastructure) is the main risk factor, against which other logistical and operational issues fade into the background.

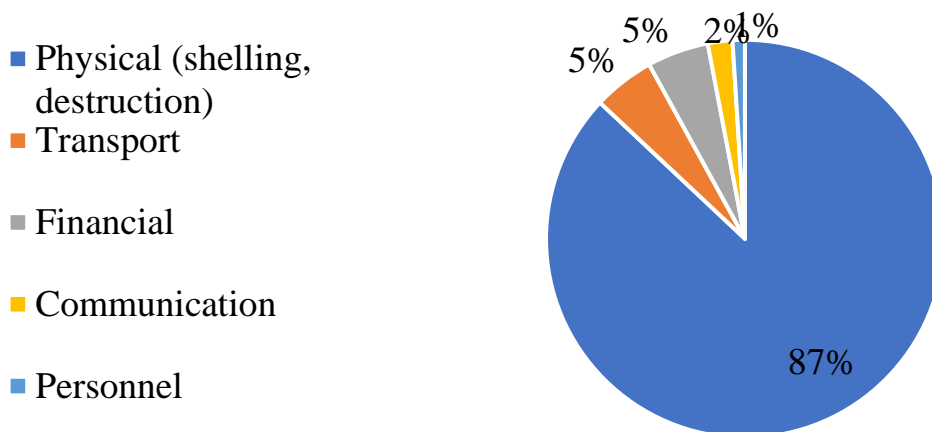


Fig. 2.7. Employee assessment of the most serious threats to logistics processes

It was found that the pharmacy chain "SLAVUTYCH" is most dependent on national-level suppliers. This type of supplier was chosen by 37% of respondents, which indicates the dominance of large all-Ukrainian distributors or manufacturers in the pharmacy chain "SLAVUTYCH" supply chains. At the same time, dependence on local suppliers (25%) and regional suppliers (21%) also remains high, indicating the significant role of local and regional entities in meeting the needs of the chain. The smallest share of the total dependence is made up of international suppliers (17%). This distribution demonstrates that, despite its location in a frontline city, the hospital's logistics processes are largely integrated into the domestic, mainly national, supply market (Fig. 2.8).

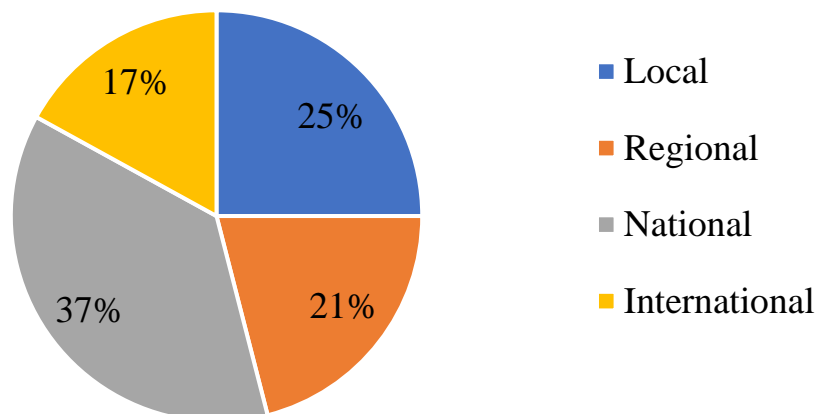


Fig. 2.8. Assessment of the chain's dependence on different types of suppliers

It was found that the majority of employees of the pharmacy chain "SLAVUTYCH" confirm the presence of alternative logistics routes in the chain, which is a key indicator of resilience in martial law conditions. A significant part of the respondents (58%) indicated that the institution has several alternative routes. Another 29% reported the presence of one alternative option. Collectively, this means that 87% of the staff are aware of the diversification of logistics routes. Only a small minority (10%) believe that there are no alternative routes, while 3% noted that they are in the process of development. Such results indicate a high level of flexibility and logistics planning in conditions of increased risk, which allows minimizing the impact of external threats on the continuity of supply (Fig. 2.9).

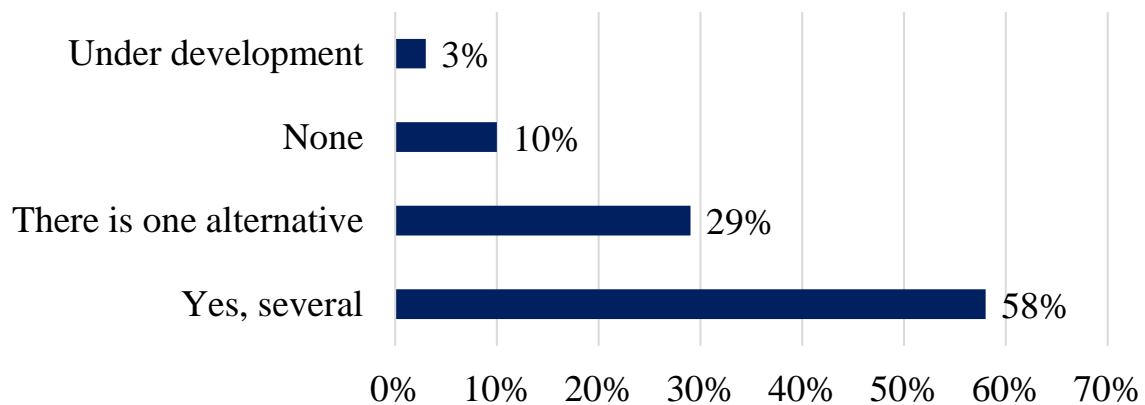


Fig. 2.9. Availability of alternative logistics routes in the chain

It was found that the internal factors that most aggravate crisis phenomena in pharmacy chain "SLAVUTYCH" are concentrated around the management of stocks and suppliers. The most important factor is the lack of warehouse stocks, which was noted by 31% of respondents, which emphasizes the problem of ensuring a sufficient buffer of resources. The second most important is the lack of backup suppliers (29%), which indicates low diversification of supply sources. The problems of insufficient communication between departments were mentioned by 23% of respondents. The least critical internal factor, but significant, is slow decision-making (17%). Therefore, to increase the internal stability of the chain, it

is necessary to focus efforts on increasing strategic stocks and diversifying backup suppliers, as well as improving interdepartmental communication (Fig. 2.10).

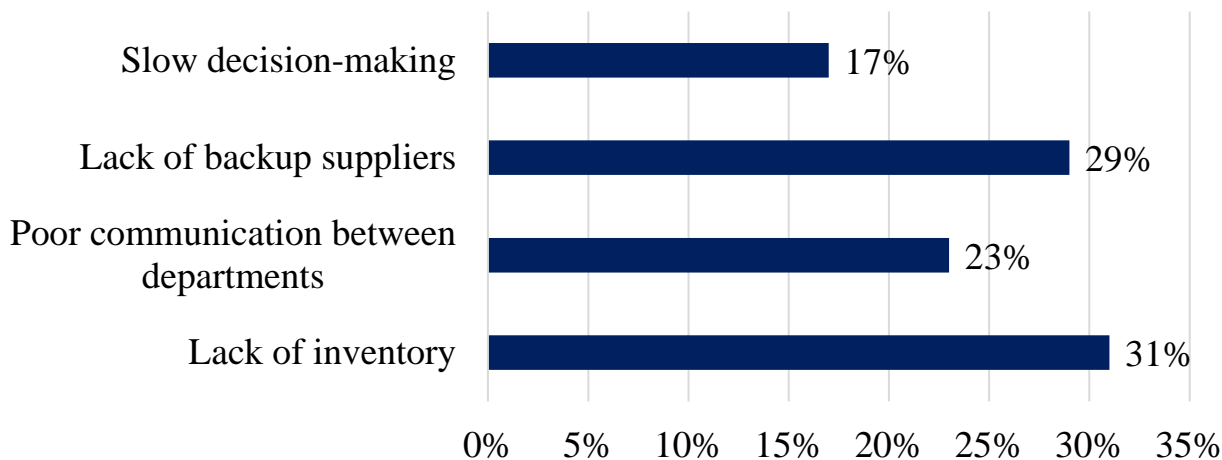


Fig. 2.10. Assessment of internal factors that exacerbate crisis phenomena in the pharmacy chain "SLAVUTYCH"

It was found that the majority of employees of the pharmacy chain "SLAVUTYCH" positively assess the chain's ability to respond promptly to logistical crises. A total of 85% of respondents consider this ability to be high (45%) or average (40%) (Fig. 2.11).

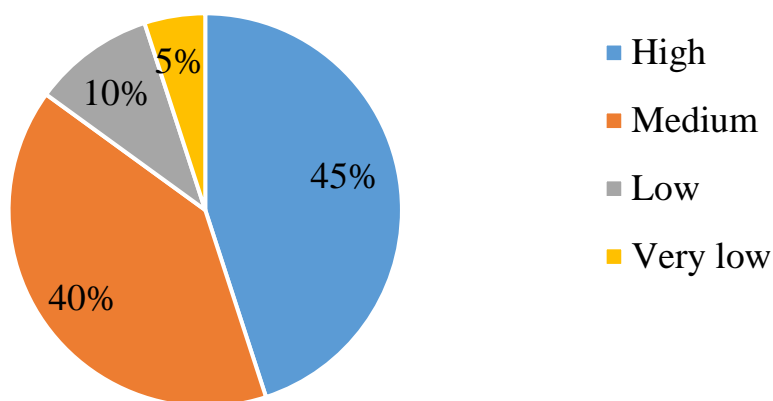


Fig. 2.11. Assessment of the chain's ability to respond quickly to logistical crises

In fact, high and medium scores dominate and are distributed almost equally, indicating the presence of effective response mechanisms, which, however, have room for improvement. Only a small aggregate proportion of staff (15%) rated the

response capacity as low (10%) or very low (5%). These results correlate with previous data on the availability of alternative routes and the rare frequency of critical delays, confirming the overall operational resilience of the facility's logistics system (Fig 2.11).

We assessed the level of sustainability of the logistics system of the pharmacy chain "SLAVUTYCH" and the effectiveness of existing anti-crisis measures. It was found that the majority of employees of the pharmacy chain "SLAVUTYCH" confirm the existence of a formalized anti-crisis logistics management plan in the chain (Fig. 2.12).

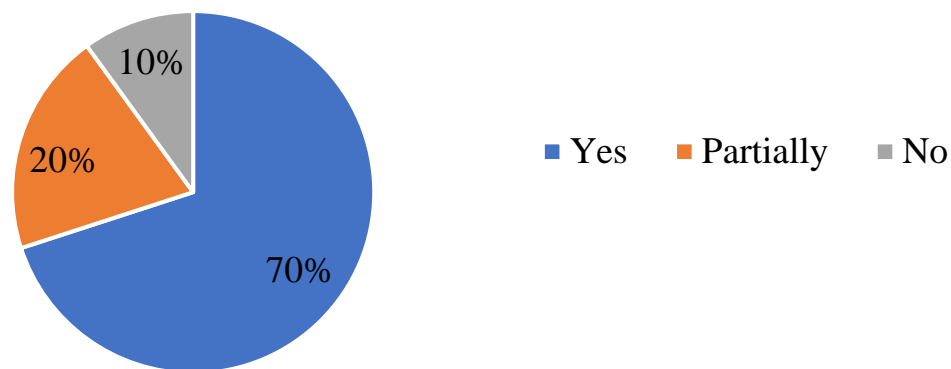


Fig. 2.12. Analysis of the presence of a formalized anti-crisis logistics management plan

The overwhelming majority of respondents – 70% answered “yes”, which is a high indicator and indicates a systematic approach to resilience planning. Another 20% of respondents believe that such a plan exists partially, perhaps meaning that not all aspects are covered or the procedures are not fully detailed. Only 10% of staff responded that there is no formalized plan. The overall share of staff who are aware of the existence of a (full or partial) plan (90%) underlines the high organizational readiness of the institution to manage logistics in crisis situations. It was found that employees of the pharmacy chain "SLAVUTYCH" generally assess the current anti-crisis measures as moderately effective. The vast majority of respondents – 65% chose the option “moderately effective”. This indicates that the measures provide basic stability and functioning, but have significant room for improvement. In total,

83% of respondents consider the measures to be positively effective (considering “very effective” and “moderately effective”). At the same time, only 18% of the staff called them “very effective”. Negative assessments (“little effective” and “not effective”) make up a total of 17% (12% and 5%, respectively). Given that the majority of respondents work in the Consultative and Diagnostic Center (59%) and not in the administrative or financial departments, this moderate assessment reflects the perception of staff on how much the anti-crisis measures actually affect their daily work and resource availability. This moderation correlates with the previously identified internal weaknesses (lack of supplies and backup suppliers) that reduce the overall effectiveness of the system, despite its existence.

It was found that regular training or exercises on anti-crisis response are practically not conducted in the institution. The vast majority of respondents – 67% noted that such events occur rarely. Only 19% confirmed that regular training is conducted, while 14% answered that there are none.

It was found that risk analysis of logistics processes in the pharmacy chain "SLAVUTYCH" is carried out, but it is not of a permanent systematic nature. Only 32% of the surveyed employees confirmed that risk analysis is carried out systematically. The total share of personnel who note that risk analysis is carried out irregularly (options "Sometimes" and "Episodic") is 52% (24% and 28%, respectively). This indicates that the majority of employees are faced with risk assessment only from time to time or within the framework of individual projects. A significant minority – 16% does not record such analysis at all.

This distribution demonstrates that risk management is reactive, not proactive, and requires increased institutionalization and regularity, despite the high level of staff awareness of logistics processes and the presence of a formalized crisis management plan. It has been established that the provision of the – with reserve stocks of vital materials is high, but not complete. A total of 80% of staff surveyed rated the level of provision as positive, indicating “yes, completely” (39%) or “partially” (41%). This indicates the successful implementation of stockpiling strategies, which is critical for a frontline facility. However, only 39% of

respondents considered provision to be complete. A significant proportion of staff (20%) indicated problems, rating provision as “minimal” (15%) or “no” (5%). This data correlates with previous findings, where inventory shortages (31%) were cited as a key internal factor exacerbating crises. This means that despite overall stocking efforts, critical segments (such as equipment and consumables, which are most susceptible to shortages) have insufficient or unevenly distributed reserves.

2.3. Identification of key problem areas in the field of anti-crisis logistics management

It has been established that the interaction of the pharmacy chain "SLAVUTYCH" with suppliers in times of crisis is highly effective. The vast majority of respondents (80%) assessed this interaction positively, indicating “very effective” (46%) or “satisfactory” (34%). Almost half of those surveyed (46%) consider the interaction to be maximally effective. Negative assessments are minimal: only 17% called the interaction “low”, and 3% – “problematic”. The high evaluation of the effectiveness of interaction with suppliers correlates with previous data on the rarity of critical delays in deliveries (69%) and a high evaluation of the ability to respond promptly to crises (85%). This indicates that established partnerships are one of the key factors in the sustainability of the institution's logistics system under martial law. It was found that the pharmacy chain "SLAVUTYCH" actively uses digital tools (ERP, electronic journals, GPS monitoring) to improve logistics processes, although their implementation is mostly partial. The majority of employees surveyed – 60% – indicated that such tools are used partially. Active use of digital solutions was confirmed by 31% of respondents. Collectively, this means that 91% of personnel are exposed to digital tools in logistics, which is a very high figure and indicates systemic digitalization. Only a minimal part – 9% indicated minimal use. This high level of integration of digital tools is one of the factors that ensures high operational stability of the logistics system and effective interaction with suppliers, despite external crisis factors. It was found that among all areas of logistics, the employees of the pharmacy chain

"SLAVUTYCH" consider storage to be the most problematic, which was chosen by 38% of respondents. In second place is transportation with an indicator of 29%, and in third place is procurement (21%). The areas of accounting and control (7%) and communications (5%) received the minimum number of votes, which indicates their relatively high efficiency or less criticality in the perception of personnel. Storage problem (38%) directly correlates with the previously identified internal factor that exacerbates crisis phenomena - lack of warehouse stocks (31%). The transportation problem (29%) corresponds to the largest external factor of disruptions – lack of drivers (40%). This confirms that improving the physical aspects of logistics (warehouse capacity and transportation) is a priority for increasing the sustainability of the facility (Fig. 2.13).

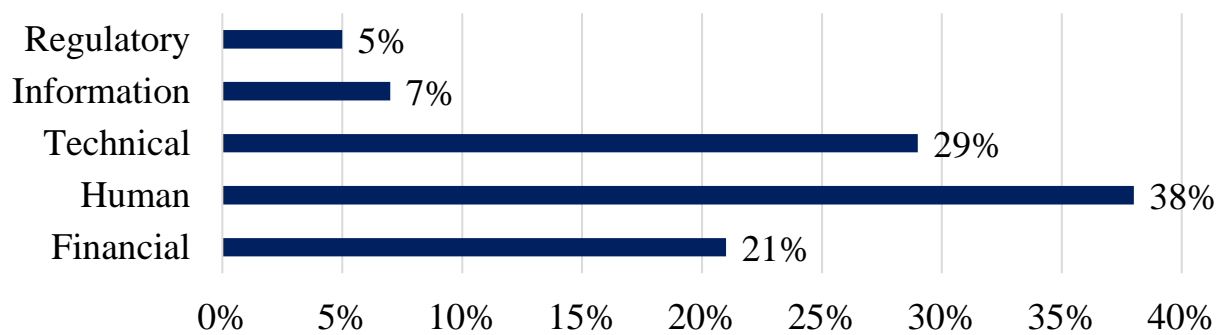


Fig. 2.13. Analysis of the areas of logistics that are the most problematic for the pharmacy chain "SLAVUTYCH"

According to the results of the survey on factors that hinder effective anti-crisis management, the main problem is an acute shortage of financial resources – this was indicated by the vast majority of respondents (44%). The next most important are technical and information resources, which are lacking by 20% and 19% of respondents, respectively. Less critical is the problem of staffing, which was noted by 12% of respondents. The least important obstacle was the lack of regulatory resources, which was singled out by only 5% of participants. Thus, almost half of the needs in anti-crisis management fall on financing, while the regulatory framework is of least concern (Fig. 2.14).

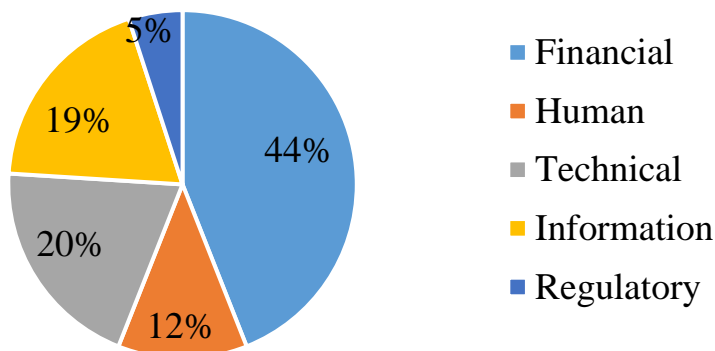


Fig. 2.14. Analysis of the structure of the deficit of resources necessary for effective anti-crisis management

It was found that among the internal factors that most complicate management decision-making in crisis situations, employees of the pharmacy chain "SLAVUTYCH" identified bureaucratic procedures and insufficient coordination as the dominant problems. The largest share (36%) was received by bureaucratic procedures, which emphasizes the need to simplify and accelerate administrative processes during crises. The second most important factor, noted by 30% of respondents, is insufficient coordination between units. This indicates that even with the presence of plans, cross-functional cooperation and clarity of the command structure are weak points. Less critical, but still significant, are the lack of up-to-date information (19%) and lack of time (15%). These results confirm the previous conclusion that, despite the overall effectiveness of the logistics system, its potential is reduced due to internal organizational obstacles. To increase the speed and quality of crisis management, the priority is to simplify administrative requirements and strengthen interdepartmental interaction (Fig. 2.15).

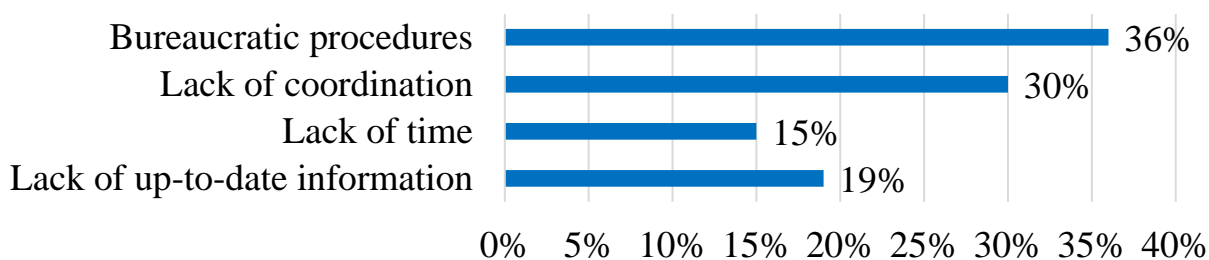


Fig. 2.15. Analysis of the factors that most complicate decision-making in crisis situations

Priority areas for improving logistics of the pharmacy chain "SLAVUTYCH" are presented on Fig. 2.16.

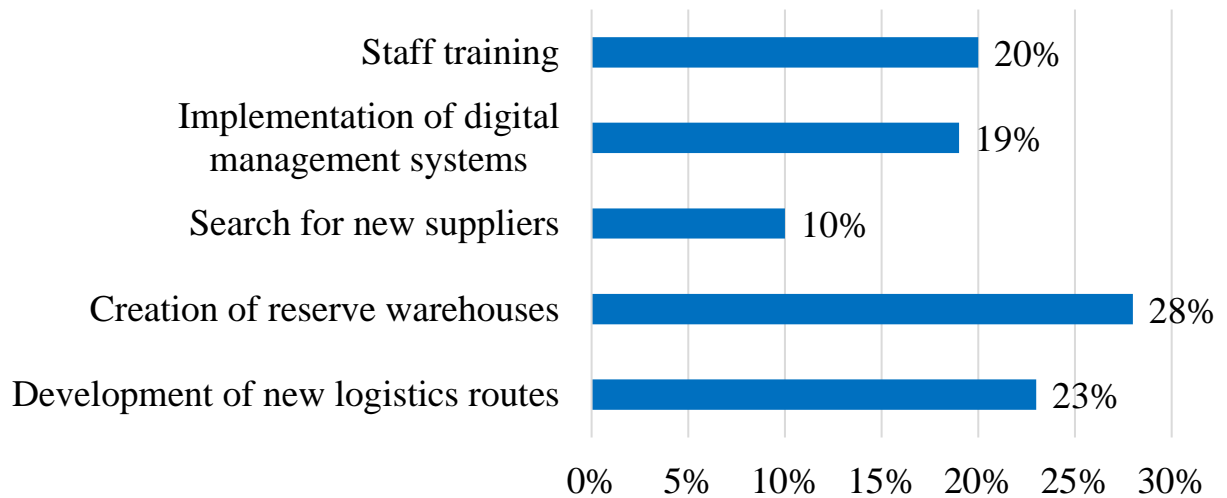


Fig. 2.16. Priority areas for improving logistics of the pharmacy chain "SLAVUTYCH"

It was found that the priority areas for improving logistics at the pharmacy chain "SLAVUTYCH" are clearly focused on physical support and inventory management. The highest priority is the creation of reserve warehouses. This directly correlates with previous findings that storage (38%) is the most problematic area of logistics, and the lack of warehouse inventory (31%) is a key internal factor exacerbating crises. The second and third most important areas are the development of new logistics routes (23%) and staff training (20%). This indicates the constant need to adapt to martial law conditions (routes) and improve competencies for working in crisis conditions. The introduction of digital management systems, despite their partial use, remains important (19%). The least priority is the search for new suppliers (10%), which may be due to the high assessment of the effectiveness of working with existing partners. In summary, staff believe that to increase resilience, it is necessary to invest, first and foremost, in physical infrastructure and adaptability. It was found that employees of the pharmacy chain "SLAVUTYCH" identified process automation and increasing the resilience of supply chains as the main priorities in improving anti-crisis logistics management. Process automation

received the largest share of votes - 24%. This indicates that the staff understands the need to accelerate and increase the accuracy of operational processes, which correlates with the previously identified problem of bureaucratic procedures (36%) that complicate crisis response. The second key priority is increasing the resilience of supply chains (21%). This is directly aimed at addressing external threats (physical risks, infrastructure destruction). Other important areas received similar shares: creating strategic reserves (20%), optimizing financial costs (18%), and improving communication between departments (17%). Therefore, staff sees the need for a comprehensive approach, where innovative and strategic solutions are leading, indicating a desire to move from tactical response to systemic and technological crisis management (Fig. 2.17).

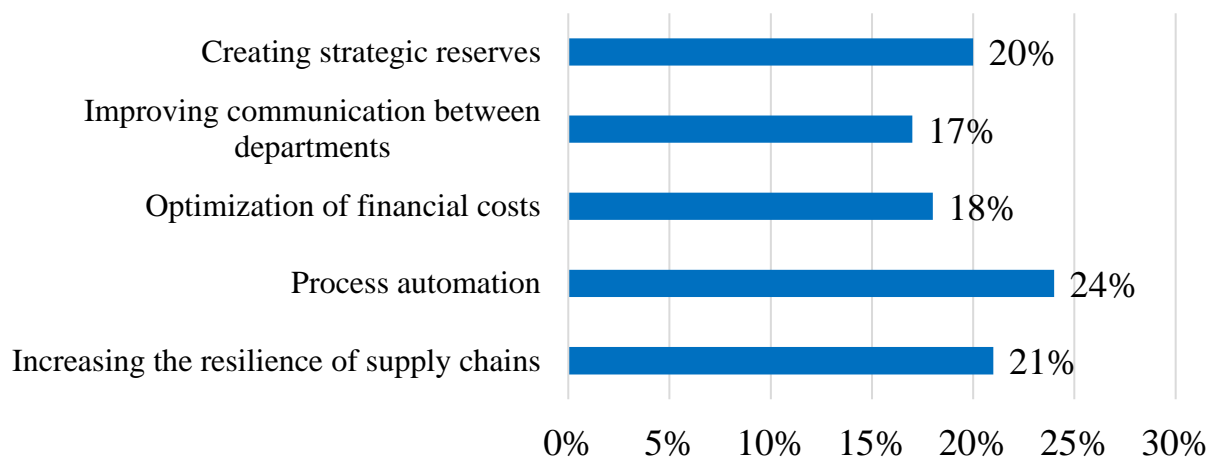


Fig. 2.17. Analysis of the main priorities in improving anti-crisis logistics management

CONCLUSIONS TO CHAPTER 2

1. It was determined that the pharmacy chain "SLAVUTYCH" operates under a centralized management model that balances corporate oversight with operational flexibility. The organizational structure is designed to maintain rigorous quality control while adapting to local demand, and its economic stability is supported by a diversified product portfolio that includes both essential medicines and high-margin parapharmaceutical products.

2. It was researched that the logistics infrastructure of the network is built upon centralized procurement and specialized warehousing that adheres to GDP standards. This logistical autonomy, supported by advanced ERP systems for real-time stock tracking, allows the chain to achieve economies of scale and maintain financial resilience despite the high capital intensity of climate-controlled storage and transport.

3. It was identified that the workforce of the pharmacy chain is highly experienced, with 64% of employees possessing over 10 years of service, ensuring that operational assessments are based on professional expertise. However, a gap in crisis preparedness exists, as 22% of personnel reported insufficient familiarity with formal anti-crisis protocols, and 67% noted that specialized emergency training is rarely conducted.

4. It was established that the primary external threats to logistics during martial law are physical in nature, with 87% of respondents citing shelling and infrastructure destruction as the most critical risks. Despite these challenges, the chain demonstrates high resilience through the use of alternative logistics routes and a high level of dependency on reliable national-level suppliers, which minimizes the frequency of critical delivery delays.

5. It was found that internal factors significantly exacerbate crisis phenomena, specifically the shortage of warehouse stocks (31%) and the lack of backup suppliers (29%). Furthermore, decision-making during emergencies is hindered by bureaucratic procedures and insufficient coordination between departments, suggesting that the current management potential is partially limited by administrative obstacles.

6. It was revealed that while the chain has achieved systemic digitalization with 91% of staff utilizing digital tools like ERP or GPS monitoring the implementation remains largely partial. To move from reactive to proactive crisis management, employees prioritize the automation of processes (24%) and the creation of strategic reserve warehouses (28%) as the most effective ways to increase the overall resilience of the supply chain.

CHAPTER 3

WAYS TO IMPROVE ANTI-CRISIS MANAGEMENT OF LOGISTICS OF THE PHARMACY CHAIN "SLAVUTYCH"

3.1. Development of a model of proactive anti-crisis logistics management based on an early warning system

The modern pharmaceutical market operates in an environment of unprecedented volatility, characterized by geopolitical instability, economic fluctuations, and systemic risks that threaten the continuity of supply chains. For pharmacy chains, the ability to maintain the availability of life-saving medications is not merely a business objective but a critical social mission. Traditional reactive management models, which focus on mitigating the consequences of a crisis after it has occurred, are increasingly proving insufficient in the face of rapid environmental shifts. Consequently, there is an urgent need to transition toward proactive anti-crisis logistics management. This approach shifts the focus from "damage control" to "pre-emptive signaling," utilizing an Early Warning System (EWS) to detect latent threats before they escalate into full-scale logistical failures [7].

The foundation of a proactive model lies in the integration of information flows and the continuous monitoring of weak signals within the internal and external environments. In the context of a pharmacy chain, an early warning system acts as a strategic radar, scanning for anomalies in supply lead times, sudden shifts in consumer demand, or disruptions in the financial stability of key national distributors. Unlike standard inventory management systems, which respond to "out-of-stock" incidents, an EWS utilizes predictive analytics to identify the probability of such incidents weeks in advance. By establishing specific thresholds or "trigger points"—management can initiate pre-defined contingency plans, such as diversifying suppliers or activating alternative logistics routes, without the pressure of an immediate emergency. This systemic foresight is particularly vital for maintaining the "cold chain" and ensuring the integrity of thermolabile products during infrastructure or energy crises.

The implementation of such a model requires a fundamental shift in organizational culture and digital infrastructure. It necessitates the breakdown of departmental silos, ensuring that data from procurement, warehousing, and sales are harmonized within a single Enterprise Resource Planning (ERP) environment. Proactive management also demands a high level of agility in decision-making. When the EWS generates a "yellow" or "red" alert, the bureaucratic lag that typically characterizes large retail networks must be bypassed by automated or semi-automated protocols. Ultimately, the development of a proactive anti-crisis logistics model based on early warnings transforms a pharmacy chain from a passive participant in a turbulent market into a resilient system capable of navigating uncertainty. By prioritizing prevention over correction, pharmaceutical enterprises can ensure long-term sustainability, safeguard their reputation, and, most importantly, provide uninterrupted healthcare support to the population [25].

A model of proactive anti-crisis logistics management is presented in table 3.1.

Table 3.1

A model of proactive anti-crisis logistics management

| Phase of Management | Component / Tool | Input Data (Signals) | Proactive Action (Response) |
|--|--------------------------------|--|--|
| I. Environmental Scanning (Monitoring) | Strategic "Radar" System | Market volatility, changes in legislation, fuel price hikes, political instability. | Continuous scanning of macro-environment to identify potential "Black Swan" events. |
| II. Signal Detection & Analysis | Early Warning Indicators (EWI) | Minor delays in supply (5-10%), fluctuations in demand for vital drugs, drop in distributor reliability. | Classification of signals by threat level: Green (Normal), Yellow (Caution), Red (Crisis). |
| III. Strategic Planning | "What-If" Scenario Modeling | Digital twin simulations of the supply chain, stress-testing warehouse capacity. | Development of pre-approved contingency plans for each risk category. |

| | | | |
|---------------------------|--------------------------------------|--|--|
| IV. Resource Optimization | Resilient Buffering | Forecasted shortages of consumables or specific medication groups. | Automatic adjustment of "Safety Stock" levels; allocation of emergency financial reserves. |
| V. Logistics Agility | Multi-Sourcing & Alternative Routing | Disruption of primary transport infrastructure or national hub failures. | Instant activation of backup regional suppliers and pre-mapped bypass logistics routes. |
| VI. Execution & Control | Automated Decision-Support (ERP) | Real-time inventory data, GPS-tracking of shipments. | Bypassing bureaucratic delays through automated purchase orders when "Trigger Points" are hit. |
| VII. Feedback Loop | Post-Event Audit | Efficiency of the response, accuracy of the early warning signal. | Refinement of EWS sensitivity thresholds and updating the crisis management manual. |

3.2. Implementation of modern information and logistics technologies to increase transparency and efficiency

The contemporary pharmaceutical landscape in Ukraine is undergoing a profound structural transformation, driven by the dual pressures of intense market competition and the volatile operational environment of martial law. For a regional leader like the pharmacy chain "SLAVUTYCH," the transition from traditional retail management to a technology-driven, transparent logistics model is no longer an optional upgrade but a fundamental requirement for survival and growth. The implementation of modern information technologies (IT) and advanced logistics frameworks serves as the backbone of this evolution, aimed at optimizing the flow of pharmaceutical products from manufacturers to the end consumer while ensuring maximum accountability at every nodal point of the supply chain.

At the core of "SLAVUTYCH's" technological integration is the deployment of a comprehensive Enterprise Resource Planning (ERP) system, specifically tailored for pharmaceutical retail. This system acts as a centralized "brain,"

synchronizing data across procurement, warehousing, and point-of-sale (POS) terminals in real-time. The primary impact of this integration is the radical increase in operational transparency. In traditional models, information silos often lead to "asymmetric data," where the central office lacks immediate visibility into local stock levels or shelf-life expirations. By utilizing cloud-based ERP solutions, "SLAVUTYCH" achieves a "single version of the truth," allowing management to monitor inventory movements with precision. This transparency effectively eliminates internal losses related to administrative errors and provides a robust audit trail, which is essential for maintaining compliance with state regulations and international Good Distribution Practice (GDP) standards.

Efficiency in logistics is further amplified through the application of Big Data analytics and automated replenishment algorithms. The "SLAVUTYCH" network utilizes historical sales data, seasonal morbidity trends, and regional demographic profiles to generate predictive demand models. Instead of relying on manual ordering, which is prone to human error and subjectivity, the automated system calculates optimal order quantities. This reduces the "bullwhip effect"—where small fluctuations in consumer demand cause massive overstocks or shortages further up the supply chain. By optimizing stock levels, the chain significantly improves its working capital turnover, reducing the amount of liquidity tied up in slow-moving inventory while simultaneously decreasing the frequency of "out-of-stock" incidents for vital medications.

Furthermore, the integration of specialized logistics technologies, such as Warehouse Management Systems (WMS) and GPS-enabled "Cold Chain" monitoring, ensures the physical integrity of the pharmaceutical assortment. For medications that are thermolabile, transparency is a matter of patient safety. Modern IoT (Internet of Things) sensors installed in "SLAVUTYCH" warehouses and transport vehicles provide continuous temperature and humidity logging. If a deviation occurs, the system triggers an immediate alert, allowing for proactive intervention before the product is compromised. This level of technological

oversight builds profound consumer trust, as patients are increasingly aware of the quality standards required for complex biological drugs and vaccines.

The transition to an omnichannel retail model represents the final frontier of "SLAVUTYCH's" current technological strategy. By integrating the physical pharmacy network with e-commerce platforms and mobile applications, the chain provides a seamless experience for the modern, tech-savvy consumer. Transparency is extended to the customer through real-time availability checks, online reservations, and digital loyalty programs. From a logistical perspective, this shift requires a sophisticated "last-mile" delivery infrastructure. The use of automated routing software optimizes delivery paths for home courier services, reducing fuel consumption and ensuring timely arrival, which is particularly critical in regions with damaged infrastructure or restricted movement.

The economic impact of these technological implementations is measurable through increased profit margins and reduced operational overheads. Transparency reduces the cost of supervision and control, while efficiency gains in the warehouse and transport segments lower the unit cost of logistics. However, the human element remains a critical variable. The successful implementation of these technologies at "SLAVUTYCH" is accompanied by rigorous staff training programs, ensuring that pharmacists and logisticians can effectively operate complex software interfaces. The synergy between high-tech infrastructure and a highly skilled workforce creates a resilient operational model capable of navigating crises.

In conclusion, the digitalization of logistics and information flows at the pharmacy chain "SLAVUTYCH" serves as a benchmark for regional pharmaceutical enterprises. By prioritizing transparency through ERP systems and efficiency through predictive analytics and IoT monitoring, the chain has built a robust defense against market volatility. These technologies do more than just streamline business processes; they enhance the reliability of the healthcare system by ensuring that the right medication reaches the right patient at the right time, in optimal condition. As the Ukrainian pharmaceutical market continues to integrate with global standards, the proactive adoption of these modern technologies will

remain the primary driver of competitive advantage and institutional resilience for "SLAVUTYCH". Key logistics technologies implemented at the pharmacy chain "SLAVUTYCH" is presented in table 3.2.

Table 3.2

**Key logistics technologies implemented at the pharmacy chain
"SLAVUTYCH"**

| Technology | Operational Function | Efficiency/Transparency Benefit |
|-------------------------|--|--|
| Cloud ERP System | Centralized data management for all branches. | Real-time stock visibility and auditability. |
| Demand Forecasting AI | Predictive analysis of sales and seasonal trends. | Reduction of overstocks and "stock-outs." |
| IoT Cold Chain Sensors | Real-time climate monitoring for thermolabile drugs. | Guaranteed product quality and safety compliance. |
| WMS | Automated bin-location and picking optimization. | Increased speed of order fulfillment and reduced errors. |
| Omnichannel Integration | Linking physical stores with online booking portals. | Increased customer loyalty and market reach. |

CONCLUSIONS TO CHAPTER 3

1. It was determined that the transition from reactive to proactive anti-crisis logistics management is a fundamental necessity for the "SLAVUTYCH" pharmacy chain to navigate the current environment of high volatility. This shift moves the focus from damage control to pre-emptive signaling through the implementation of an Early Warning System (EWS) that detects latent threats before they escalate into logistical failures.

2. It was researched that a successful proactive model relies on the integration of information flows and the continuous monitoring of "weak signals" across the internal and external environments. By utilizing predictive analytics and establishing specific "trigger points," the network can initiate pre-defined contingency plans such as diversifying suppliers or activating alternative routes—well before an actual emergency occurs.

3. It was identified that the implementation of a proactive management model requires the removal of departmental silos and a total digital transformation through a centralized ERP environment. This organizational shift ensures that the bureaucratic lag common in large retail networks is bypassed by automated or semi-automated protocols, allowing for high-speed decision-making when "yellow" or "red" alerts are generated by the EWS.

4. It was established that the deployment of modern information technologies, specifically cloud-based ERP systems, radically increases operational transparency. This transparency eliminates internal losses related to administrative errors and provides the robust audit trail necessary for compliance with international GDP standards.

5. It was found that logistics efficiency is significantly enhanced through Big Data analytics and automated replenishment algorithms, which mitigate the "bullwhip effect." By utilizing predictive demand models instead of manual ordering, the "SLAVUTYCH" chain improves working capital turnover and decreases the frequency of out-of-stock incidents for vital medications.

6. It was revealed that the integration of specialized technologies, such as Warehouse Management Systems (WMS) and IoT-enabled "Cold Chain" monitoring, is critical for patient safety and consumer trust. These tools allow for real-time climate logging and automated routing for omnichannel delivery, ensuring that pharmaceutical products reach the end consumer in optimal condition while reducing operational overheads.

CONCLUSIONS

1. It was determined that logistical support acts as the "circulatory system" of a pharmacy chain, requiring a "zero error" approach to ensure GDP compliance and cold chain integrity. It was researched that logistics serves as a strategic tool for managing material and information flows, optimizing costs under strict price regulations and limited profitability. It was revealed that effective anti-crisis management must shift from reactive measures to the early diagnosis and prevention of threats through a systematic, multi-stage process of risk mitigation and recovery.

2. It was determined that the pharmacy chain "SLAVUTYCH" operates under a centralized management model that balances corporate oversight with operational flexibility. The organizational structure is designed to maintain rigorous quality control while adapting to local demand, and its economic stability is supported by a diversified product portfolio that includes both essential medicines and high-margin parapharmaceutical products.

3. It was researched that the logistics infrastructure of the network is built upon centralized procurement and specialized warehousing that adheres to GDP standards. This logistical autonomy, supported by advanced ERP systems for real-time stock tracking, allows the chain to achieve economies of scale and maintain financial resilience despite the high capital intensity of climate-controlled storage and transport.

4. It was identified that the workforce of the pharmacy chain is highly experienced, with 64% of employees possessing over 10 years of service, ensuring that operational assessments are based on professional expertise. However, a gap in crisis preparedness exists, as 22% of personnel reported insufficient familiarity with formal anti-crisis protocols, and 67% noted that specialized emergency training is rarely conducted.

5. It was established that the primary external threats to logistics during martial law are physical in nature, with 87% of respondents citing shelling and infrastructure destruction as the most critical risks. Despite these challenges, the

chain demonstrates high resilience through the use of alternative logistics routes and a high level of dependency on reliable national-level suppliers, which minimizes the frequency of critical delivery delays.

6. It was found that internal factors significantly exacerbate crisis phenomena, specifically the shortage of warehouse stocks (31%) and the lack of backup suppliers (29%). Furthermore, decision-making during emergencies is hindered by bureaucratic procedures and insufficient coordination between departments, suggesting that the current management potential is partially limited by administrative obstacles.

7. It was revealed that while the chain has achieved systemic digitalization with 91% of staff utilizing digital tools like ERP or GPS monitoring the implementation remains largely partial. To move from reactive to proactive crisis management, employees prioritize the automation of processes (24%) and the creation of strategic reserve warehouses (28%) as the most effective ways to increase the overall resilience of the supply chain.

8. It was determined that the "SLAVUTYCH" pharmacy chain must transition to proactive logistics through an Early Warning System (EWS) to neutralize risks before they escalate into crises. It was researched that this model's success relies on digital transformation via ERP systems and Big Data, which eliminate bureaucratic delays and enhance demand forecasting accuracy. It was revealed that the integration of WMS and IoT monitoring ensures supply chain transparency and cold chain compliance, significantly increasing operational efficiency and patient safety.

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APPENDICES

Questionnaire

To assess the state of logistics processes, the level of resilience and effectiveness of anti-crisis measures in conditions of military operations, and identify key problem areas, please select one or more answer options, depending on the question format.

BLOCK I. Identification and classification of the main crisis threats to logistics processes during military operations

1. What factors most affect supply disruptions during martial law?

- Destruction of transport infrastructure
- Fuel shortage
- Delays at checkpoints
- Loss of suppliers
- Other (specify) _____

2. Which resource groups are most susceptible to scarcity?

- Medications
- Consumables
- Equipment
- Personal protective equipment
- Food
- Other (specify) _____

3. How often does the facility experience critical delivery delays?

- Very often
- Often
- Rarely
- Almost never

4. What type of threats do you consider the most serious for logistics processes?

- Physical (shelling, destruction)
- Transportation
- Financial
- Communication
- Personnel

5. Which suppliers does the chain depend on the most?

- Local
- Regional
- National
- International

6. Does the institution have alternative logistics routes?

- Yes, several
- There is one alternative
- None

Continuation of Appendix A

In development

7. What internal factors most exacerbate crisis phenomena?

Shortage of inventory

Insufficient communication between departments

Lack of backup suppliers

Slow decision-making

Other _____

8. How do you assess the institution's ability to respond promptly to logistical crises?

High

Average

Low

Very low

9. Does the institution have a formalized anti-crisis logistics management plan?

Yes

Partially

No

10. How effective are the current anti-crisis measures?

Very effective

Moderately effective

Not very effective

Not effective

11. Are there regular crisis response training or exercises?

Yes

Rarely

No

12. Is a risk analysis of logistics processes carried out?

Yes, systematically

Sometimes

Occasionally

Never

13. Is the facility stocked with backup supplies of vital supplies?

Yes, completely

Partially

Minimal

No

14. How effective is interaction with suppliers in times of crisis?

Very effective

Satisfactory

Continuation of Appendix A

Low

Problematic

15. Are digital tools (ERP, electronic journals, GPS monitoring) used to improve logistics?

Yes, actively

Partially

Minimal

Not used

16. Which area of logistics is the most problematic?

Procurement

Storage

Transportation

Accounting and control

Communications

17. What resources are most lacking for effective crisis management?

Financial

Personnel

Technical

Informational

Regulatory

18. What makes decision-making in crisis situations the most difficult?

Lack of up-to-date information

Lack of time

Insufficient coordination

Bureaucratic procedures

Other _____

19. What areas of logistics improvement do you consider to be the most important?

Development of new logistics routes

Creation of reserve warehouses

Search for new suppliers

Introduction of digital management systems

Staff training

20. In your opinion, what should be the main priority in improving anti-crisis logistics management?

Increasing the resilience of supply chains

Process automation

Optimization of financial costs

Improving communication between departments

Continuation of Appendix A

Creation of strategic reserves

21. Your position: _____

22. Your unit:

Consultative and diagnostic center

Inpatient

Administrative and Management Department

Business part

Laboratory

Other _____

23. Work experience in the healthcare sector:

Up to 1 year

1–5 years

6–10 years

11–20 years old

Over 20 years

24. Do you have experience participating in logistics and/or procurement processes?

Yes, regularly

Sometimes

Rarely

Never

25. How well are you familiar with the institution's anti-crisis procedures?

Very good

Good

Satisfactory Insufficient

National University of Pharmacy

Faculty pharmaceutical

Department management, marketing and quality assurance in pharmacy

Level of higher education master

Specialty 226 Pharmacy, industrial pharmacy

Educational and professional program Pharmacy

APPROVED

**The Head of Department
management, marketing and
quality assurance in
pharmacy**

Volodymyr MALYI

«01» September 2025

**ASSIGNMENT
FOR QUALIFICATION WORK
OF AN APPLICANT FOR HIGHER EDUCATION**

Imad HNIAD

1. Topic of qualification work: «Ensuring the sustainability of logistics of pharmacy chains in condition of crisis», supervisor of qualification work: Iryna BONDARIEVA, C.Sc.Ph, assoc. prof.

approved by order of NUPh from “06” of October 2025 № 266

2. Deadline for submission of qualification work by the applicant for higher education: May 2026

3. Outgoing data for qualification work: sources of scientific literature, directories, retail sector of the pharmaceutical market, legislative and regulatory framework, statistical and reporting data, activity of pharmacy enterprises, analysis of professional periodicals.

4. Contents of the settlement and explanatory note (list of questions that need to be developed): to investigate the essence and role of logistical support within the system of functioning of pharmacy chains; to characterize the theoretical principles of anti-crisis management; to identify the specificity and features of crisis phenomena manifestations in the logistics processes of pharmacy chains; to provide an organizational and economic characterization of the pharmacy chain "SLAVUTYCH" pharmacy chain; to identify and classify the main crisis threats to the logistical processes of the pharmacy chain "SLAVUTYCH"; to identify key problem areas in the field of anti-crisis logistics management of the researched network; to develop a model of proactive anti-crisis logistics management based on an early warning system; to substantiate the implementation of modern information and logistics technologies to increase transparency and efficiency of the logistics system.

5. List of graphic material (with exact indication of the required drawings): Figures – 18, tables – 6

6. Consultants of chapters of qualification work

| Chapters | Name, SURNAME, position of consultant | Signature, date | |
|----------|---|-----------------------|-------------------------|
| | | assignment was issued | assignment was received |
| 1 | Iryna BONDARIEVA, associate professor of higher education institution of department management, marketing and quality assurance in pharmacy | 01.09.2025 | 01.09.2025 |
| 2 | Iryna BONDARIEVA, associate professor of higher education institution of department management, marketing and quality assurance in pharmacy | 30.11.2025 | 30.11.2025 |
| 3 | Iryna BONDARIEVA, associate professor of higher education institution of department management, marketing and quality assurance in pharmacy | 16.03.2026 | 16.03.2026 |

7. Date of issue of the assignment: «01» September 2025.

CALENDAR PLAN

| № | Name of stages of qualification work | Deadline for the stages of qualification work | Notes |
|----|--|---|-------|
| 1 | Collection and generalization of data from scientific literature by areas of qualification work | September 2025 | done |
| 2 | Study of theoretical and methodological basis of anti-crisis management in logistics | October 2025 | done |
| 3 | Identification and classification of the main crisis threats to the logistical processes of the pharmacy chain "SLAVUTYCH" | November 2025 | done |
| 4 | Identification of key problem areas in the field of anti-crisis logistics management | December 2025 | done |
| 5. | Implementation of modern information and logistics technologies to increase transparency and efficiency | January 2026 | done |
| 6 | Writing and design of qualification work | March 2026 | done |
| 7 | Approbation of qualification work | May 2026 | done |
| 8 | Submission of the qualification work to the EC of the National University of Pharmacy | May 2026 | done |

An applicant of higher education _____ Imad HNIAD

Supervisor of qualification work _____ Iryna BONDARIEVA

ВИТЯГ З НАКАЗУ

По Національному фармацевтичному університету

«06» жовтня 2025 р.

№ 266

Фармацевтичний факультет

Затвердити теми кваліфікаційних робіт здобувачам вищої освіти 5 курсу 2025-2026 н. р., група Фм21(4,10д)англ-01, освітньо-професійна програма «Фармація», спеціальність «226 Фармація, промислова фармація», галузь знань «22 Охорона здоров'я», рівень вищої освіти другий (магістерський), денна форма здобуття освіти, термін навчання 4 роки 10 місяців, мова навчання англійська.

| Прізвище, ім'я здобувача вищої освіти | Тема кваліфікаційної роботи (українською мовою) | Тема кваліфікаційної роботи (англійською мовою) | Керівник кваліфікаційної роботи | Рецензент кваліфікаційної роботи |
|--|---|--|---------------------------------|----------------------------------|
| Кафедра менеджменту, маркетингу та забезпечення якості у фармації | | | | |
| Хніад Імад | Забезпечення стійкості логістичних ланцюгів аптечних мереж в умовах кризових явищ | Ensuring the sustainability of logistics of pharmacy chains in condition of crisis | доц. Бондарева І.В. | доц. Терещенко Л.В. |

Підстава: подання декана фармацевтичного факультету доцента Олександра ГОНЧАРОВА

Ректор**Вірно. Секретар**

ВИСНОВОК
експертної комісії про проведену експертизу
щодо академічного плагіату у кваліфікаційній роботі
здобувача вищої освіти
«05» травня 2026 р. № 333760095

Проаналізувавши кваліфікаційну роботу здобувача вищої освіти ХНІАД Імада, групи ФМ21(4,10д)англ-01, спеціальності 226 Фармація, промислова фармація, освітньої програми «Фармація» очної (денної) форми здобуття освіти на тему: «Забезпечення стійкості логістичних ланцюгів аптечних мереж в умовах кризових явищ / Ensuring the sustainability of logistics of pharmacy chains in condition of crisis», експертна комісія дійшла висновку, що робота, представлена до Екзаменаційної комісії для захисту, виконана самостійно і не містить елементів академічного плагіату (копіляції).

Заступник голови Комісії,
заступник директора інституту
в складі ЗВО ННІПФ,
доцент



Олена НОВОСЕЛ

REVIEW

of scientific supervisor for the qualification work of the master's level of higher education of the specialty 226 Pharmacy, industrial pharmacy

Imad HNIAD

on the topic: «Ensuring the sustainability of logistics of pharmacy chains in condition of crisis»

Relevance of the topic. The critical role of logistics in ensuring the continuity and quality of medical care makes it a key object for scientific research and practical improvement. Modern pharmacy chains operate in conditions of chronic unpredictability: from a sharp increase in demand to the destabilization of supply chains caused by the destruction of infrastructure, road blockades, and significant currency fluctuations.

Practical value of conclusions, recommendations and their validity. The practical significance of the obtained results lies in the development of applied tools that enhance the operational stability of pharmacy chains during periods of high uncertainty. The proposed model of proactive anti-crisis management, integrated with an early warning system, provides pharmacy managers with a concrete algorithm for identifying logistical "bottlenecks" before they escalate into critical failures.

Assessment of work. Imad HNIAD conducted a significant research work and successfully coped with it, showed the ability to analyze and summarize data from literary sources, to work independently. In the work, the research results are properly interpreted and illustrated with figures. While completing the qualification work, the higher education applicant showed creativity, purposefulness, independence, and perseverance.

General conclusion and recommendations on admission to defend. The qualification work of the 5th year applicant of higher education Phm21(4,10) eng-01 group Imad HNIAD on the topic: "Ensuring the sustainability of logistics of pharmacy chains in condition of crisis" is a completed scientific study, which in terms of relevance, scientific novelty, theoretical and practical significance meets the requirements for qualification works, and can be presented to the EC of the National University of Pharmacy.

Scientific supervisor

_____ Iryna BONDARIEVA

12 May 2026

REVIEW

**for qualification work of the master's level of higher education, specialty 226
Pharmacy, industrial pharmacy**

Imad HNIAD

**on the topic: «Ensuring the sustainability of logistics of pharmacy chains in
condition of crisis»**

Relevance of the topic. The issues of logistics and customer service in pharmaceutical and healthcare enterprises have been considered in the works of many scientists. The issue of improving the organization of medical services using logistical approaches has been studied by both domestic and foreign scientists. At the same time, the issue of increasing the efficiency of the logistics activities of pharmacy chains remains insufficiently disclosed and requires further scientific study.

Theoretical level of work. The qualification work reveals the theoretical foundations of the essence and role of logistical support in the system of functioning of pharmacy chains.

Author's suggestions on the research topic. The practical value of these results is found in the creation of functional tools designed to strengthen the operational resilience of pharmacy chains amidst volatile market conditions.

Practical value of conclusions, recommendations and their validity. The results of the study have practical significance and can be used by pharmaceutical chains to improve of logistics processes.

Disadvantages of work. As a remark, it should be noted that some results of the literature review, which are presented in the first chapter, need stylistic refinement. In general, these remarks do not reduce the scientific and practical value of the qualification work.

General conclusion and assessment of the work. Imad HNIAD qualification work "Ensuring the sustainability of logistics of pharmacy chains in condition of crisis" is a scientifically based analytical study that has theoretical and practical significance. The qualification work meets the requirements for qualification papers and can be submitted to the EC of the National University of Pharmacy.

Reviewer _____ assoc. prof. Lyubov TERESHCHENKO

13 May 2026

**МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ
ВИТЯГ З ПРОТОКОЛУ № 19**

14 травня 2026 року

м. Харків

**засідання кафедри менеджменту, маркетингу
та забезпечення якості в фармації**

Голова: завідувач кафедри ММЗЯФ, доктор фарм. наук, професор
Малий В. В.

Секретар: доцент ЗВО, канд. фарм. наук, доц. Жадько С.В.

ПРИСУТНІ: зав. кафедри ММЗЯФ, доктор фарм. наук, проф.
Малий В.В., професор ЗВО, докт. фарм. наук, проф. Пестун І.В., професор ЗВО,
докт. фарм. наук, проф. проф. Літвінова О.В., професор ЗВО, докт. фарм. наук,
проф. проф. Коваленко С.М., професор ЗВО, докт. фарм. наук, проф. Крутських
Т.В., професор ЗВО, докт. фарм. наук, проф. проф. Посилкіна О.В., доцент ЗВО,
канд. фарм. наук, доц. Бабічева Г.С., доцент ЗВО, канд. фарм. наук, доц.
Бондарєва І.В., канд. екон. наук, доц. Деренська Я.М., доцент ЗВО, канд. фарм.
наук, доц. Жадько С.В., канд. фарм. наук, доц. Зборовська Т.В., канд. юрид. наук,
доц. Коляда Т.А., канд. фарм. наук, доц. доц. Лісна А.Г., доцент ЗВО, канд. фарм.
наук, доц. Малініна Н.Г., доцент ЗВО, канд. фарм. наук, доц. Рогуля О.Ю.,
здобувачі вищої освіти фармацевтичного факультету.

ПОРЯДОК ДЕННИЙ: Про допуск здобувачів вищої освіти випускного
курсу фармацевтичного факультету спеціальності 226 Фармація, промислова
фармація, освітньо-професійної програми Фармація до захисту кваліфікаційних
робіт в Екзаменаційній комісії НФаУ.

СЛУХАЛИ: Про допуск здобувача вищої освіти факультету
фармацевтичного випускного курсу спеціальності 226 Фармація, промислова
фармація освітньо-професійної програми Фармація групи Фм21(4,10д)англ-01
Імад ХНІАД до захисту кваліфікаційної роботи в Екзаменаційній комісії НФаУ.
Кваліфікаційна робота на тему «Забезпечення стійкості логістичних ланцюгів
аптечних мереж в умовах кризових явищ».

ВИСТУПИЛИ: В обговоренні кваліфікаційної роботи взяли участь
проф. ЗВО Пестун І.В., доц. ЗВО Бабічева Г.С. Керівник кваліфікаційної роботи:
доц., канд. фарм. наук Бондарєва І.В.

УХВАЛИЛИ: Допустити здобувача вищої освіти Імад ХНІАД до захисту
кваліфікаційної роботи на тему «Забезпечення стійкості логістичних ланцюгів
аптечних мереж в умовах кризових явищ» в Екзаменаційній комісії НФаУ.

Зав. каф. ММЗЯФ, доктор фарм. наук,
професор
Секретар, доцент ЗВО,
канд. фарм. наук, доцент

Володимир МАЛИЙ

Світлана ЖАДЬКО

НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

ПОДАННЯ ГОЛОВІ ЕКЗАМЕНАЦІЙНОЇ КОМІСІЇ ЩОДО ЗАХИСТУ КВАЛІФІКАЦІЙНОЇ РОБОТИ

Направляється здобувач вищої освіти Імад ХНІАД до захисту кваліфікаційної роботи за галуззю знань 22 Охорона здоров'я спеціальністю 226 Фармація, промислова фармація освітньо-професійною програмою Фармація на тему: «Забезпечення стійкості логістичних ланцюгів аптечних мереж в умовах кризових явищ».

Кваліфікаційна робота і рецензія додаються.

Декан факультету _____ / Олександр ГОНЧАРОВ /

Висновок керівника кваліфікаційної роботи

Здобувач вищої освіти Імад ХНІАД виконала на кафедрі менеджменту, маркетингу та забезпечення якості у фармації НФаУ кваліфікаційну роботу, яка присвячена дослідженню забезпечення стійкості логістичних ланцюгів аптечних мереж в умовах кризових явищ.

У першому розділі досліджено теоретичні засади функціонування логістичної підтримки в аптечних мережах та визначено ключову роль антикризового управління в забезпеченні стабільності фармацевтичного бізнесу. У другому розділі проведено аналіз фінансово-господарської діяльності мережі аптек «СЛАВУТИЧ», у ході якого ідентифіковано основні загрози логістичним процесам та виокремлено критичні проблемні зони в системі управління. У третьому розділі запропоновано модель проактивного логістичного менеджменту на основі системи раннього попередження та обґрунтовано впровадження сучасних інформаційних технологій для підвищення ефективності роботи підприємства.

У цілому подана до захисту кваліфікаційна робота Імад ХНІАД на тему «Забезпечення стійкості логістичних ланцюгів аптечних мереж в умовах кризових явищ» відповідає вимогам, що висувуються до кваліфікаційних робіт, оцінюється позитивно і може бути рекомендована для захисту в Екзаменаційну комісію НФаУ.

Керівник кваліфікаційної роботи _____

Ірина БОНДАРЄВА

12 травня 2026 року

Висновок кафедри про кваліфікаційну роботу

Кваліфікаційну роботу розглянуто. Здобувач вищої освіти Імад ХНІАД до захисту даної кваліфікаційної роботи в Екзаменаційній комісії.

Завідувач кафедри
менеджменту, маркетингу та
забезпечення якості у фармації

Володимир МАЛІЙ

14 травня 2026 року

Qualification work was defended
of Examination commission on
«09» of June 2026

With the grade _____

Head of the State Examination commission,
D.Pharm.Sc, Professor

_____ /Volodymyr YAKOVENKO/