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CURRENT STATE OF SCIENTIFIC RESEARCH ON PHARMACOLOGICAL CORRECTION OF MAMMARY GLAND PATHOLOGIES (A SCOPING REVIEW)

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The aim of the study *is to conduct a bibliosemantic analysis of scientific literature on pharmacological correction of breast pathologies and to determine the proportion of studies on pharmacological correction of mastopathy.*
Materials and methods. *In the context of our study, the analysis of data on the current state of research on the pharmacological correction of mammary gland pathologies and the identification of the proportion of studies focusing on the pharmacological correction of mastopathy was carried out using the enhanced Arksey & O'Malley methodology proposed by a group of researchers led by H.M. Daudt. A total of 540 publications (from the last five years) were reviewed.*
Results*. The results of the study showed that the vast majority of publications are devoted to the pharmacological correction of breast cancer (78%). Studies on the pharmacological correction of mastopathy make up a significantly smaller share (22%), which confirms their relevance, particularly regarding the development of original drugs. Among these, herbal-based medicinal products are most commonly used as part of combination therapy (59%).*
Conclusions. *Studying the current state of scientific research on a given topic is an integral part of planning and developing a strategy for one's own research. A detailed analysis of the available literature makes it possible to identify unresolved issues that remain unaddressed by researchers from different countries, and to outline relevant niches for further scientific investigation.*
A bibliosemantic analysis of scientific literature on pharmacological correction of breast pathologies was conducted, and the relevance of conducting research on the development of herbal remedies for the pharmacological correction of mastopathy was established
Keywords: *mammary gland pathologies, pharmacological correction, method analysis, scoping review*

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1. Introduction

Pathologies of the mammary gland include conditions such as acute and chronic mastitis, fibrocystic mastopathy, gynecomastia, benign and malignant neoplasms, with malignant tumours posing the greatest threat. Among these nosological entities, fibrocystic mastopathy holds a special place, affecting between 30% and 60% of women according to various sources [1, 2]. The primary cause is hormonal imbalance, and the condition most commonly occurs in women aged 40 to 50 years. Although the changes in breast tissue are benign, patients with mastopathy are at a high risk of malignancy [3–8]. Currently, therapeutic approaches aimed at restoring hormonal balance are used, which have a positive effect in suppressing the growth of fibrocystic tissue. Medicines based on medicinal plants are becoming increasingly common in various areas of pharmaceutical development [9–14].

The selection and justification of an optimal treatment regimen are critical components of successful pharmacological correction of these pathologies. Therefore, **the aim of this study** is to conduct a bibliosemantic analysis of the scientific literature concerning the pharmacological correction of mammary gland pathologies and to determine the proportion of studies focused on the pharmacological correction of mastopathy.

2. Research planning (methodology)

The study was conducted using a methodology developed and refined by a group of researchers led by H. M. Daudt et al. (2013), based on the framework proposed by Arksey & O'Malley [15]. The methodology is structured around six key stages aimed at examining the scope, nature, and distribution of scientific publications on the selected topic:

– determination of the research issue – a scientific question is formulated, aimed at identifying content features in a set of literary sources; it determines the logic of bibliosemantic analysis and the criteria for selecting publications.;

– search for appropriate research – a targeted search for scientific publications, monographs, and review papers is conducted in relevant databases; the goal is to form a corpus of sources for further semantic analysis;

– outline the sample of research – criteria for selecting literary sources are determined; the sample formed should be representative of the issue under study;

– analysis of the received data – key concepts and categories in the selected texts are systematised and semantically analysed; content analysis, comparison, and generalisation methods are used;

– generalisation and discussion of results – the results of the literature analysis are generalised and explained, taking into account the development of pharmaceutical science and practice in the studied issue;

– consultation with profile specialists (optional stage) – discussion of the results with specialists in the field of pharmacy contributes to a more accurate and reasonable interpretation of the data from the literature analysis.

3. Materials and methods

The search was conducted using electronic databases that were considered the most relevant according to the predefined criteria:

– specialisation in medical/pharmaceutical literature;

– rating indicators, including international;

– extended search;

– availability of publications in open access.

Therefore, the research was conducted using electronic databases such as Google Scholar, Wiley Online Library, and PubMed, which meet the aforementioned criteria.

Considering the aim of the study, the sample was formed using search queries based on the following keywords: pharmacotherapy/pharmacological correction of mammary gland pathologies, drug/medicine for mammary gland pathologies (Fig. 1).

Wiley Online Library and PubMed are electronic science databases characterised by a high level of evidence in their publications. Despite a relatively small number of search results, they provide sufficient high-quality information on fundamental scientific research in the field.

A distinctive feature of Google Scholar is the larger number of search results compared to other databases; however, many of these publications often do not meet the criteria of scientific rigour, evidence-based content, or reproducibility.

In view of this, we developed a set of criteria to determine the relevance of search results to our research query:

– publication in peer-reviewed journals of Ukraine and worldwide;

– publication within the last 6 years (2020–2025);

– availability of full-text access for detailed review and analysis of materials, methods, and research results;

– relevance of the topic to the pharmacological correction of mammary gland pathologies (as opposed to frequently encountered publications on the comprehensive and differential diagnosis of mammary gland pathologies, as well as review articles on their aetiology, pathogenesis, and clinical presentation).

Therefore, 540 scientific publications were involved in a detailed review.

4. Research results

According to the results of the analysis of the selected publications, we identified two main categories of current research: pharmacological correction of malignant mammary gland neoplasms (78% of publications) and pharmacological correction of benign pathologies, particularly mastopathy (22%). Each category can be further divided into subcategories that characterise the research directions described in the publications:

– literature review of existing methods for pharmacological correction of mammary gland pathologies;

– development of alternative pharmacological correction schemes for mammary gland pathologies;

– experimental studies focused on the development of new drug formulations;

– description of clinical trial results for new drugs (Fig. 2, 3).

A significant portion of both categories consists of literature reviews on available pharmacological correction methods for both malignant (71%) and benign mammary gland pathologies (50%).

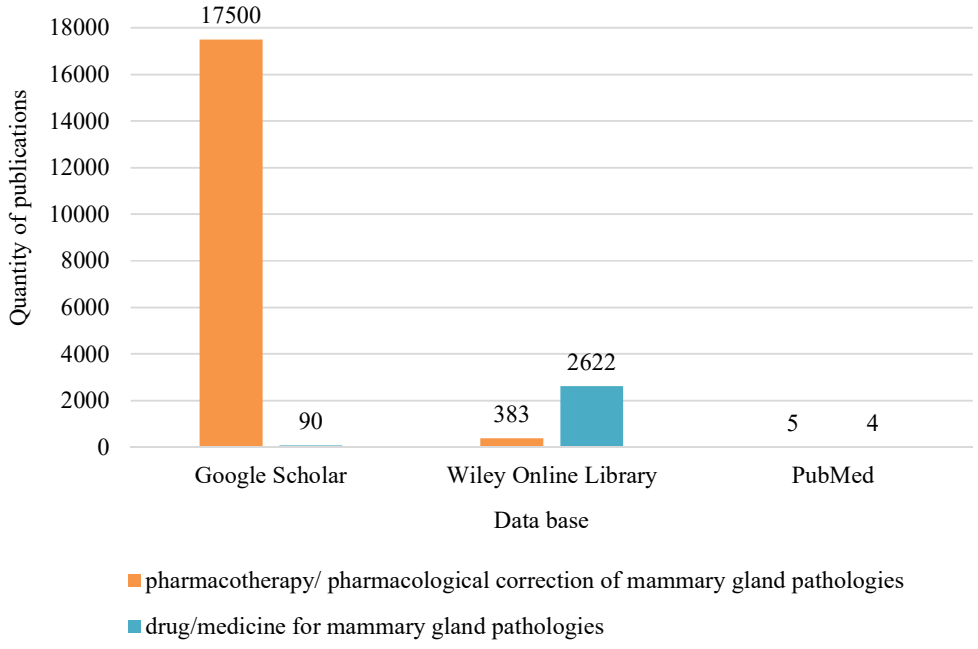

Fig. 1. Distribution of keywords search results in electronic databases under study, pcs.

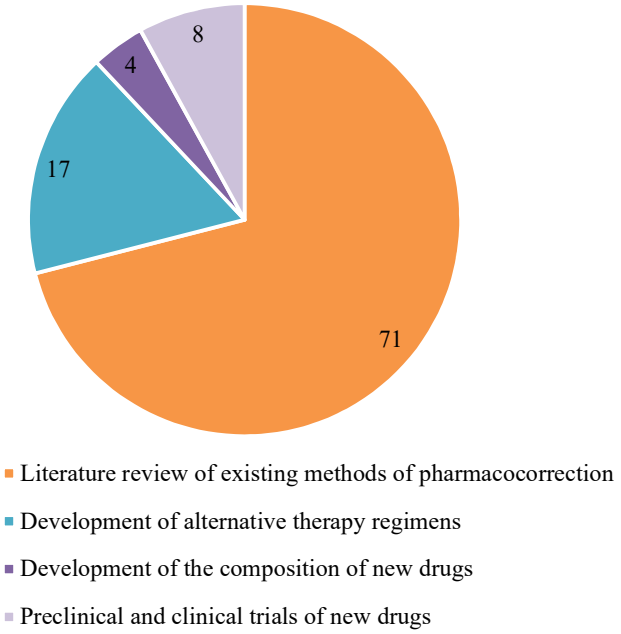

Fig. 2. Distribution of publications on pharmacological correction of malignant mammary gland neoplasms by established subcategories, %

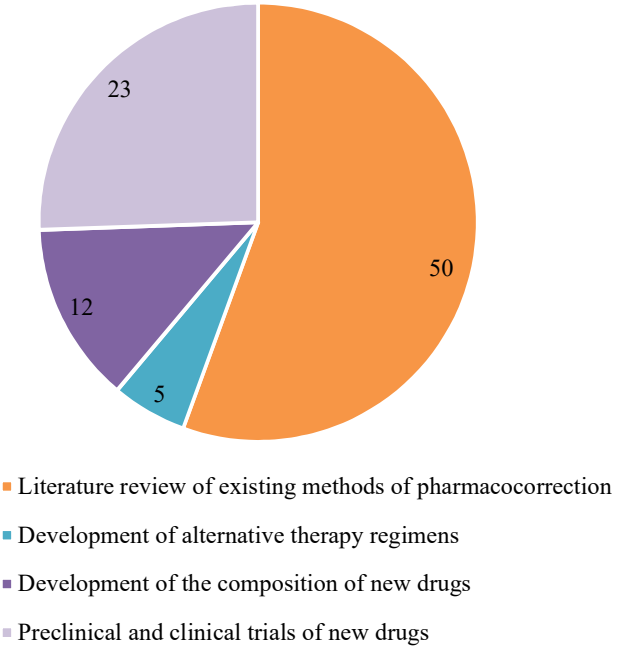

Fig. 3. Distribution of publications on pharmacological correction of benign mammary gland pathologies by established subcategories, %

Considering the focus of our own research, we conducted a more detailed analysis of the subcategory covering experimental studies on the development of new drug formulations for the pharmacological correction of benign mammary gland pathologies, particularly mastopathy.

The results indicate a significant interest among researchers in the development of drugs based on medicinal plant raw materials, which are valuable sources of phytohormones (Fig. 4). Such drugs are considered part of combination therapy aimed at reducing proliferation, and in some cases, as monotherapy agents. Analysis of the developed drugs by dosage form showed that researchers prefer oral administration, with tablets being the most common form (Fig. 5).

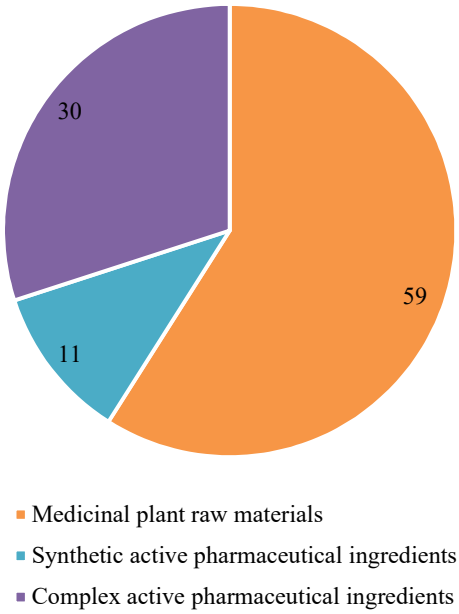

Fig. 4. Distribution of publications on the development of new drug formulations for pharmacological correction of benign mammary gland pathologies by origin of active pharmaceutical ingredients, %

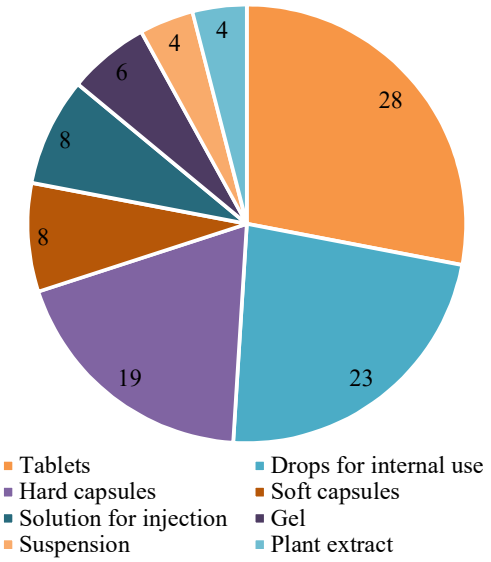

Fig. 5. Distribution of publications on the development of new drug formulations for pharmacological correction of benign mammary gland pathologies by dosage forms, %

5. Discussion of research results

5. 1. Pharmacological correction of malignant mammary gland neoplasms

Literature review of existing methods for pharmacological correction of mammary gland pathologies.

Conducted a literature review and identified the characteristics of therapy for patients at different stages of breast cancer, as well as described the dependence of drug selection on menopausal status. They established

that the main goal at each stage of treatment is to prolong survival and improve the quality of life for patients [16].

Systematised information regarding the benefits and risks of adjuvant and neoadjuvant treatments in breast cancer and provided generalised recommendations to help select the optimal therapy regimen for specific patient groups [17].

Presented the current treatment methods for breast cancer, including new approaches such as antibody-drug conjugate systems, nanoparticles (albumin-based, metal, lipid, polymer, micelle nanoparticles), and breast cancer stem cell-based therapy. Additionally, they discussed prognostic biomarkers used in some diagnostic tests [18].

Reviewed the development of early breast cancer treatment systems over the past 50 years, highlighting the shift from a focus on local therapy to systemic precision treatment approaches. They specifically addressed topics related to targeted and molecular therapies [19].

Conducted a theoretical study on treatment regimen selection for breast cancer patients over 65 years old. They paid special attention to minimising risks, reducing therapy cytotoxicity, and choosing molecularly targeted treatment methods based on biomarkers for this purpose [20].

Summarised therapeutic approaches related to the molecular classification of breast cancer, which facilitates the selection of individualised treatment regimens for each patient. They concluded that precision medicine provides the most optimal therapy option, where each breast cancer patient receives the most appropriate diagnosis and targeted therapy based on the genetic profile of the cancer [21].

Also emphasise the importance of a personalised approach to breast cancer treatment and the role of advanced technologies in the development of precision therapy. They provided a thorough analysis of recent studies on mechanisms that promote breast cancer treatment, new strategies, and features of long-term patient management [22].

Reviewed various aspects of breast cancer, including gene therapy strategies, limitations, challenges, and recent studies in the field. They found that this therapeutic approach is less toxic compared to traditional methods [23].

Analysed scientific articles from the past 10 years to study the features of local breast cancer treatment. They established that surgical methods have evolved from radical surgery to conservative mastectomies, thus reducing the risk of adverse effects for patients. Additionally, adjuvant and neoadjuvant therapies have become more widespread, contributing to disease control of both distant metastases and local recurrence [24].

Outlined the current perspective on immunotherapy, particularly checkpoint inhibitors, in various types of breast cancer. They focused more in-depth on the study of biomarkers as a key element of the therapeutic process in immunotherapy [25].

Reviewed targeted therapy for breast cancer applied in clinical practice, its impact on breast cancer progression, as well as indications, contraindications, and main side effects. They described the current state of scientific research in this field and highlighted future directions for development [26].

Reviewed nanoparticles as carriers for targeted delivery of chemotherapeutic drugs, their characteristics, structure, and previous studies related to breast cancer. They found that nanoparticles can reduce the adverse effects of chemotherapeutic agents while simultaneously increasing their efficacy. They compared lipid-, metal-, and polymer-based nanocarriers and characterised the features of each [27].

Conducted a literature review on the use of the less common percutaneous method compared to other therapy approaches. They identified specific features of its application depending on the tumour size and concluded the importance of the percutaneous method for certain patient groups; however, they noted that a broader practical application requires an expanded evidence base [28].

Reviewed recent research in radiotherapeutic treatment of breast cancer, including dose escalation in high-risk cases, the possibilities of accelerated fractionation, partial breast irradiation, and omission of irradiation in low-risk cases. They outlined the potential of molecular profiling to inform decision-making regarding primary radiotherapy and reirradiation [29].

Conducted a literature review of the last 20 years and described current advances in breast cancer therapy, particularly in radiation biology [30].

Examined systemic antitumor treatment regimens in patients with metastatic breast cancer in real-world clinical practice across Europe since 2016, aiming to assess whether these regimens reflect clinical guidelines and recent changes in available treatment options. They found that the latest developments in treating patients with metastatic breast cancer are indeed reflected in treatment regimens observed in real-world practice [31].

Theoretically examined the potential of albumin nanoparticles designed for the delivery of chemotherapeutic drugs and their targeted approach to breast cancer treatment. They also highlighted various multifunctional treatment methods available using albumin nanoparticles as therapeutic agents for breast cancer therapy [32].

Reviewed clinical developments and recent advances in targeted therapy and immunotherapy for breast cancer. In addition to successful cases, they characterised the challenges and prospects of this therapeutic approach to provide an objective assessment and outline potential patient groups [33].

Analysed the application of mathematical models in the search for breast cancer treatment strategies. Contemporary studies indicate the reliability of such models and their broad potential for use in clinical practice. The authors also characterised several models that are already successfully utilised, including the combination of immunotherapy with drugs for treating comorbidities [34].

Provided a review of current combination therapies, including molecular-targeted therapy, hormonal therapy, immunotherapy, and chemotherapy. They described the molecular basis of breast cancer, different treatment options for various breast cancer subtypes, and the prospects for using innovative combination therapies compared to traditional monotherapies [35].

Conducted a review of current data on the use of a new class of drugs-selective estrogen receptor degraders (SERDs). The authors reviewed not only scientific literature sources but also results from ongoing clinical trials. They concluded that oral selective estrogen receptor degraders represent a promising new class of drugs; however, their role in therapy alongside standard endocrine treatments and targeted therapy requires further clarification [36].

Examined the current state of scientific research and clinical cases of breast cancer treatment in men, both in adjuvant therapy and metastatic settings. The authors also discussed the biology and genomic background of male breast cancer. The literature review included original studies and review articles published between 2010 and 2019 [37].

Development of alternative pharmacological correction schemes for breast pathologies.

Focus on identifying shared genetic determinants between breast cancer and diseases that increase the risk of its occurrence. Using genome-wide association approaches, the authors identified new targets for personalised therapy [38].

Reviewed current advances in the development of vesicular nanosystems for targeted delivery of anticancer drugs in breast cancer. The authors analyse the effectiveness of liposomes and exosomes in improving drug bioavailability [39].

Analysed drug interactions in patients with breast cancer receiving multicomponent therapy. The authors described the influence of pharmacokinetic and pharmacodynamic factors on treatment efficiency [40].

Summarised the latest pharmacological developments for the treatment of breast cancer, including targeted drugs and immunomodulators. The authors also drew attention to overcoming drug resistance [41].

Provided a comprehensive overview of current nanoformulations for breast cancer treatment, including polymeric, lipid, and metal oxide nanoparticles that improve controlled drug release and biocompatibility [42].

Demonstrate innovative directions in breast cancer treatment, including personalised medicine, genomic approaches, and artificial intelligence to optimise therapeutic strategies [43].

Analyse the role of adipocytes in the microenvironment of breast cancer, investigating their impact on tumour progression and potential as a therapeutic target [44].

Examine the mechanisms of drug resistance development in breast cancer and the latest nanotherapeutic approaches to overcome it, in particular through controlled drug release [45].

Presented a review of nanosystems for curcumin in breast cancer therapy, considering the advantages of liposomal, polymeric, and micellar forms in increasing bioavailability [46].

Reviewed current antibody-dependent conjugates in the treatment of breast cancer, considering their specificity, mechanism of action, and clinical outcomes [47].

Analysed new therapeutic approaches using antibody-dependent conjugates, which combine the selectivity of biological agents and the potency of cytotoxic drugs [48].

Summarised the principles of targeted therapy for breast cancer, considering current molecular targets, mechanisms of action, and prospects for individualised treatment [49].

Proposed a novel approach to treating metastatic lesions in breast cancer using nanoparticles for targeted drug delivery [50].

Similarly, suggest the use of nanocarriers for delivering chemotherapeutic agents, which enhances cytotoxicity against breast tumour cells and prevents resistance development. They also consider nanocarriers as an auxiliary diagnostic method (for biomarker detection) [51].

Proposes the introduction of a new oral drug into the comprehensive treatment regimen for various cancers, including breast cancer. This proposal is supported by clinical trial data and information about its approval in the USA [52].

Reviewed preclinical and clinical studies on the combination of calcitriol with various anticancer drugs, emphasising its main therapeutic benefits and potential for breast cancer treatment. They found that calcitriol combined with different types of antitumor agents enhances their beneficial effects in an additive or synergistic manner; however, an adjuvant treatment regimen based on calcitriol has not yet been fully developed [53].

Proposed directions for RNA therapy in breast cancer. The theoretical basis included the classification, mechanisms, advantages, and challenges of RNA therapy. The feasibility of such treatment was supported by clinical trial results of RNA-targeted therapy and the development of antitumor RNA drugs [54].

Scientific literature increasingly mentions the inclusion of medicinal plant-based preparations in treatment regimens or the development of new drugs for the treatment of breast cancer. This approach is driven by the search for safer and more selective agents capable of reducing the toxic effects of traditional chemotherapy and radiation therapy. Bioactive compounds of plant origin, in particular flavonoids, alkaloids, terpenoids, and phenolic acids, demonstrate pronounced antiproliferative, proapoptotic, and antioxidant activity. Research into these components opens up prospects for the creation of new pharmacological agents that can act as adjuvants or independent agents in the complex therapy of oncological diseases [55–71].

Description of the results of preclinical and clinical trials of new drugs.

Investigated the therapeutic potential of drugs targeting ferroptosis in the treatment of breast cancer. The authors consider the molecular mechanisms of ferroptosis induction, its interaction with tumour cell signalling pathways, and the possibility of using ferroptosis-modulating drugs to overcome resistance to chemotherapy [72].

Conducted a clinical evaluation of the effectiveness of various drug treatment options for mastalgia in patients with fibrocystic breast disease. The authors compared hormonal and nonsteroidal agents, finding differences in pain reduction and the frequency of side effects [73].

Investigated the biological effects of crocin, a natural carotenoid, on proliferation, angiogenesis, and inflammation in breast cancer cells. The authors found a synergistic effect of crocin with anticancer drugs [74].

Analysed the antitumor activity of quercetin, highlighting its antioxidant, antiproliferative, and antiangiogenic properties. They drew attention to the potential of quercetin nanoforms to increase therapeutic efficacy [75].

Studied the synergistic antitumor effect of combinations of curcumin with chemotherapeutic drugs, demonstrating increased apoptosis and reduced treatment toxicity [76].

Investigated the benefits of combining pertuzumab and trastuzumab for subcutaneous administration in patients with early breast cancer who had completed neoadjuvant therapy. They found that most patients preferred the subcutaneous administration of the drug combination compared to intravenous administration. The subcutaneous administration was generally well tolerated, and no adverse effects were reported [77].

Conducted an open-label, randomised, controlled phase III trial to evaluate the efficacy and safety of pyrotinib combined with capecitabine after prior trastuzumab treatment. They found that the combination of pyrotinib with capecitabine could be used as an alternative therapeutic option for breast cancer following trastuzumab therapy [78].

During clinical trials, it was established that the treatment regimen with paclitaxel and carboplatin is an effective alternative adjuvant chemotherapy method for patients with operable breast cancer. However, platinum sensitivity in different disease subgroups requires further clarification [79].

Experimental studies on the development of new drug formulation.

Highlights the role of retinoids as promising anticarcinogenic agents in breast cancer, considering their effect on cell differentiation, apoptosis, and gene regulation [80].

Investigate the use of microneedles as an innovative platform for transporting nanoparticles in breast cancer therapy, demonstrating the increased effectiveness of such drug delivery [81].

Describe the use of computational drug repositioning methods to discover new therapeutic agents against breast cancer, highlighting the effectiveness of intelligent data analysis algorithms [82].

Developed nanocochleate systems loaded with methotrexate for the treatment of breast cancer, demonstrating optimised encapsulation efficiency and controlled drug release [83].

Investigated nanoparticle-based drug delivery systems for breast cancer therapy, focusing on stability, transportation efficiency, and release control parameters [84].

Presented an optimised approach to creating abemaciclib-encapsulated nanosponges to improve release kinetics and cytotoxicity against breast cancer cells [85].

Developed a niosome formulation loaded with letrozole and studied its anticancer effect in vitro on breast cancer cell lines MCF-7, MCF10A, and MDA-MB-231. The results showed that niosomes could be a promising drug carrier for delivering letrozole to cancer cells [86].

Conducted research on the development of nanoparticles based on a combination of polyglycerol, malic acid, and dodecanedioic acid loaded with curcumin for the treatment of breast cancer. The antitumor activity was demonstrated in vitro on breast cancer cell lines MCF-7 and MDA-MB-231 [87].

Their study reveals the use of antibody-conjugated nanocarriers capable of delivering drugs to target organs in an unchanged form, controlling drug release, and reducing drug toxicity. Additionally, antibody-conjugated nanocarriers showed optimal activity in clinical settings [88].

Focused on the encapsulation or bioconjugation of chemotherapeutic agents with nanoparticles for targeted drug delivery in breast cancer. Such formulations are safer, equally effective, and have the potential to replace existing anticancer drugs [89].

Conducted research to improve the solubility of baicalin to enhance its antitumor activity. They developed a delivery nanosystem based on a zeolite imidazole framework. The efficacy of the developed system was confirmed through in vitro and in vivo studies [90].

4. 2. Pharmacological correction of benign breast disorders

A literature review of existing methods of pharmacological correction of breast disorders.

Based on a review of the literature, a connection between stress and diseases of the female reproductive system was established. They proposed a rehabilitation method for patients with mastopathy caused by psychoemotional stress, based on a comprehensive approach (rehabilitation and preventive method) [91].

Conducted a review of current scientific literature on the issue of benign breast changes and evidence-based therapeutic recommendations. The author addressed challenges related to differentiating between normal and pathological conditions, outlined the main diagnostic and treatment methods for fibrocystic breast changes and gynaecological diseases associated with this pathology, as well as genetic predispositions. The study also presented characteristics of the main components of herbal medicines used to treat fibrocystic breast changes [92].

Focused their research on studying the impact of hormonal imbalance resulting from disrupted estradiol metabolite synthesis on the development of breast and other reproductive system pathologies. Based on the results, they proposed the use of non-hormonal phytotherapeutic complexes composed of biologically active substances, such as indole-3-carbinol, barberry extract, and polyphenols, which help normalise the antiproliferative activity of estrogens [93].

Studied the aetiology and prevalence of mastopathy worldwide, as well as approaches to its classification. The authors conducted a comparative analysis of the diagnostic signs of nodular and diffuse mastopathy and identified strategic directions for pharmacocorrection [94].

Analysed and summarised data from professional literature and their own experience in treating patients with disorders of the female reproductive system, particularly fibrocystic breast disease, using phytotherapeutic

methods. They considered the effects of medicinal plants on various links in the pathogenesis of the disease. Based on the conducted research, they developed recommendations for improving and expanding the use of phytotherapy in the treatment of specific pathologies [95].

Development of alternative schemes for the pharmacological correction of breast disorders.

Conducted a study on optimising the treatment of dishormonal breast diseases and evaluated the effectiveness of phytoselective therapy using the preparation "Tazalok". They found that monotherapy with "Tazalok" is a highly effective treatment method, leading to both functional and structural changes in breast tissue, reducing pain syndrome and sonographic signs of the disease, and therefore may be recommended as an alternative therapy [96].

In search of a safe and effective alternative for treating fibrocystic breast disease, researchers examined the impact of Ayurvedic combinations on this condition. They concluded that a comprehensive treatment approach is the most effective [97].

Investigated metformin as an alternative treatment strategy for fibrocystic breast disease. The results demonstrated a certain degree of effectiveness; however, the authors suggest that further studies are needed to confirm these findings [98].

Studied the effects of different concentrations of danazol on oxidative phosphorylation in Mcf10a breast cells in women with fibrocystic mastopathy. Based on their findings, the authors proposed danazol as an alternative therapy for mastopathy [99].

Description of results from preclinical and clinical trials of new drugs.

Studied the pharmacological effects and efficacy of the drug "Mladomaston" (containing Vitex agnus-castus extract, green tea extract, indole-3-carbinol, soy isoflavones, and trans-resveratrol). They found that a three-month course of the drug provided significant effectiveness, reduced breast pain, and diminished the severity of proliferative processes in breast tissue. The high efficacy of "Mladomaston" supports its recommendation for broader clinical use in the conservative treatment of fibrocystic mastopathy [100].

Conducted a comparative assessment of the effectiveness of danazol and a combination of danazol with evening primrose oil in the treatment of fibrocystic breast disease. The results were interpreted based on the drugs' effects on mastalgia. The findings indicated a preference for danazol as a monotherapy [101].

Conducted a randomised, double-blind clinical trial to assess the effect of flaxseed oil on breast pain intensity and nodularity compared to vitamin E. The study demonstrated that both flaxseed oil and vitamin E were effective in relieving breast pain and reducing nodularity, with minimal side effects compared to the baseline. However, no significant differences were found between the two treatments within the scope of the study [102].

Conducted a study aimed at addressing the treatment of patients with combined uterine and breast pathology. As part of a comprehensive treatment approach, the use of the drug "Nodinorm," whose main active ingredient is indole-3-carbinol, was proposed [103].

Conducted an interventional study on the effects of melatonin therapy in women with fibrocystic breast disease. A reduction in clinical symptoms and improvement in hormonal profile were demonstrated without significant adverse reactions [104].

Experimental studies on the development of new drug formulations.

Conducted a study to evaluate the quality indicators and stability of a developed herbal medicinal mixture for the complex therapy of mastopathy during storage. It was established that the preparation remains stable for up to two years when stored in a cool place or at room temperature [105].

Practical significance. The study allowed us to systematise modern approaches to pharmacotherapy, analyse the mechanisms and effectiveness of existing therapeutic agents, and outline promising areas for their improvement. Relevant niches in the study of pharmacotherapy for breast pathologies were identified, and a scientifically sound basis for the further development of safer and more effective pharmacological strategies was formed.

Study limitations. The study was conducted according to the established methodology and within the framework of the defined objectives, and has no limitations.

Prospects for further research. The review revealed relevant niches in research related to the development of drugs for the treatment of breast pathologies. The data obtained can be used in practical research.

6. Conclusions

Based on the results of the conducted study, we can conclude that the majority of scientific publications are devoted to reviewing literature sources regarding the features of therapy for both malignant and benign breast pathologies. However, fewer publications are addressing the development of new medicinal formulations for the treatment of benign breast diseases compared to information on new drugs for breast cancer therapy. This highlights the need for further research in this area, particularly the development of orally administered drugs containing active pharmaceutical ingredients of plant origin, which are an integral part of the complex treatment for benign breast pathologies.

Conflict of interest

The authors declare that they have no conflict of interest in relation to this study, including financial, personal, authorship, or any other, that could affect the study and its results presented in this article.

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Data availability

The manuscript has data included as electronic supplementary material.

Use of artificial intelligence

The authors confirm that they did not use artificial intelligence technologies when creating the presented work.

Authors' contribution

Polina Palyvoda: Investigation, Conceptualization, Formal analysis, Writing – original draft; **Svitlana Zuikina:** Methodology, Supervision; **Volodymyr Yakovenko:** Visualization; **Liubov Bodnar:** Project administration, Writing – review & editing; **Oleksandr Shmalko:** Validation.

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