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Review Article

The clinical pharmacist's role in optimising the management of menopausal symptoms in breast cancer survivors: a narrative review

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Abstract

Breast cancer survivors frequently experience menopausal symptoms resulting from treatment-induced ovarian failure, ovarian suppression, and prolonged endocrine therapy. The symptoms may be abrupt and severe, substantially affecting quality of life and complicating survivorship care. Systemic menopausal hormone therapy is generally contraindicated in hormone receptor-positive disease; management relies predominantly on non-hormonal pharmacological therapies, selected local treatments, and supportive non-pharmacological strategies. These interventions are often layered onto complex oncological regimens, increasing the risk of drug–drug interactions and fragmented follow-up.

This narrative review synthesises current evidence on non-hormonal management of menopausal symptoms in breast cancer survivors and examines the established and potential roles of clinical pharmacists within oncology and survivorship pathways. A structured MEDLINE search was conducted to identify relevant clinical studies, guidelines, and pharmacist-focused publications.

Clinical pharmacists can contribute to structured symptom assessment, optimisation of non-hormonal therapies, identification of pharmacokinetic interactions with endocrine treatments, and facilitation of multidisciplinary communication across oncology, gynaecology, and primary care.

Integrating menopause-focused pharmaceutical care into multidisciplinary approaches could enhance symptom management, treatment safety, and patient-centred survivorship support.

Keywords

breast cancer survivorship, clinical pharmacy, integrated care, menopausal symptoms, oncology pharmacy

Introduction

Breast cancer survivors frequently encounter menopausal symptoms that arise from natural ageing and, more prominently, as a direct consequence of treatment-induced ovarian failure, ovarian suppression, or prolonged endocrine therapy, all of which can precipitate abrupt oestrogen depletion and its sequelae (Cusack et al. 2013; Servayge et al. 2023). Symptoms affecting vasomotor function, genitourinary health, sexual well-being, and mood are commonly reported and can substantially affect quality of life (Hickey et al. 2008; Servayge et al. 2023). Numerous survivors also report unmet supportive care needs, including limited access to coordinated symptom-management strategies,

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fragmented follow-up, and insufficient information regarding treatment options (Fan et al. 2023; Morga et al. 2025).

Because systemic menopausal hormone therapy is generally contraindicated in women with a history of hormone-receptor-positive breast cancer, management of menopausal symptoms relies on non-hormonal pharmacological therapies, carefully selected local vaginal oestrogen or alternatives where appropriate, and a range of non-pharmacological strategies (Servayge et al. 2023; Sanft et al. 2025). These treatments are usually layered on top of complex oncological regimens and comorbid conditions, increasing the risk of drug–drug interactions, inadequate symptom relief, and early discontinuation of supportive or cancer therapies (Hickey et al. 2008; Hershman et al. 2010). In this context, optimising medication use and supporting continuous follow-up are central components of comprehensive survivorship care (Sanft et al. 2025). Some of these antineoplastic medicines are granted with specific storage requirements in pharmacies (Grigorov et al. 2023).

Clinical pharmacists are playing an expanding role in oncology and survivorship services, where they help manage systemic anticancer therapies, monitor oral chemotherapy, optimise supportive care, and provide patient education (Hao La et al. 2018; Holle et al. 2020). Programmatic reports and small-scale clinical models indicate that expanded pharmacist involvement can support symptom assessment and management, medication counselling, and identification of supportive care needs within multidisciplinary clinics (Hao La et al. 2018; Undeberg et al. 2025). However, the specific role of clinical pharmacists in addressing menopause-related symptoms in breast cancer survivors remains sparsely described in the menopause and oncology literature, despite evidence of significant vasomotor symptom burden and gaps in symptom management for these patients.

This narrative review aims to synthesise current evidence on the clinical pharmacist's role in supporting and managing menopausal symptoms in breast cancer survivors, with emphasis on non-hormonal and locally acting therapies, optimisation of treatment safety, and integration within multidisciplinary oncology and survivorship care frameworks (Servayge et al. 2023; Sanft et al. 2025). It also seeks to identify gaps in current practice and research and to outline practical opportunities for service development in clinical pharmacy.

Methods

This narrative review was undertaken to map and synthesise published evidence on the non-hormonal management of menopausal symptoms, with particular emphasis on vasomotor symptoms, in breast cancer survivors and to examine the current and potential role of clinical pharmacists within this area of survivorship care.

A structured literature search was conducted in MEDLINE (via PubMed) from database inception to December 2025 (search performed on 01 February 2026). The primary search strategy aimed to identify clinical studies evaluating non-hormonal treatment approaches for vasomotor symptoms in breast cancer and included the following terms: ("breast cancer") AND ("hot flashes" OR "vasomotor symptoms") AND (nonhormonal OR "non-hormonal" OR "non hormonal") AND (treatment OR management OR therapy). The search was limited to English-language publications involving adult female human populations.

Titles and abstracts were screened for relevance, followed by full-text assessment of potentially eligible articles. Screening was performed by one reviewer, with uncertainties resolved through re-evaluation of predefined eligibility criteria. Studies were included if they involved adult female breast cancer survivors (natural or treatment-induced menopause) and evaluated non-hormonal pharmacological or non-pharmacological interventions for vasomotor symptom management. Randomised and non-randomised clinical trials, observational studies, systematic reviews, and clinical guidelines were considered. Articles focusing solely on non-breast malignancies, fertility preservation, hormonal therapies as primary interventions, or topics unrelated to menopausal symptom management were excluded. Reference lists of included publications were handsearched to identify additional relevant studies.

The primary structured search identified 47 records after applying filters. Following title and abstract screening and full-text assessment, 24 publications met the inclusion criteria and were included in the narrative review.

To determine whether pharmacist-led interventions had been described in this specific clinical context, an additional targeted search was performed using Title/Abstract restrictions: ("breast cancer"[Title/Abstract]) AND ("hot flashes"[Title/Abstract] OR "vasomotor symptoms"[Title/Abstract]) AND (pharmacist*[Title/Abstract] OR pharmacy[Title/Abstract] OR "clinical pharmacy"[Title/Abstract] OR "pharmaceutical care"[Title/Abstract]). This search did not identify any controlled studies specifically evaluating pharmacist-led management of vasomotor symptoms in breast cancer survivors.

This review did not follow a full systematic review methodology, and no formal risk-of-bias assessment was undertaken. Given anticipated heterogeneity in study design and outcome measures, findings were synthesised narratively and organised thematically into (i) clinical impact of menopause in breast cancer survivors; (ii) evidence-based non-hormonal treatment options; (iii) established and potential roles of clinical pharmacists; and (iv) barriers, enablers, and future directions for pharmacy services in survivorship care.

Menopause in breast cancer survivors

Epidemiology and mechanisms

Breast cancer is increasingly diagnosed in women who are still premenopausal: population analyses estimate that roughly 20–25% of new breast cancer cases occur in women

younger than 50 years, and age-standardised incidence rates for younger women in high-income regions approach the mid-30s per 100 000. A substantial proportion of these women experience premature or abrupt menopause as a consequence of chemotherapy, ovarian suppression with gonadotropin-releasing hormone agonists, or bilateral oophorectomy. The risk of treatment-induced ovarian failure depends strongly on patient age and the chemotherapy regimen: alkylating-agent-containing regimens (for example, CMF, CEF, and CAF) carry the highest gonadotoxic risk, particularly in women aged ≥ 40 years, while anthracycline-based regimens have intermediate risk that varies with cyclophosphamide dose and schedule. In contemporary cohorts, chemotherapy-related amenorrhoea is common (most patients develop amenorrhoea during or shortly after adjuvant chemotherapy), and roughly half of affected younger women may progress to permanent menopause over medium-term follow-up (Stearns et al. 2006; Liem et al. 2015; Heer et al. 2020; Mauri et al. 2020; Himpe et al. 2023).

Table 1 summarises the current evidence on the epidemiology of breast cancer and treatment-induced menopause in premenopausal women.

Younger breast cancer survivors are particularly vulnerable to sudden and severe vasomotor and psychological symptoms, infertility concerns, and long-term hypo-oestrogenic complications as a result of treatment-induced ovarian failure (Stearns et al. 2006; Mauri et al. 2020; Himpe et al. 2023). Endocrine therapies such as tamoxifen and aromatase inhibitors, frequently combined with ovarian function suppression using gonadotropin-releasing hormone agonists or bilateral oophorectomy, can further exacerbate vasomotor and musculoskeletal complaints and may worsen genitourinary syndrome of menopause (Hickey et al. 2008; Servayge et al. 2023). Together, these treatment-related effects mean that many breast cancer survivors experience menopausal symptoms earlier, more abruptly, and often more intensely than women undergoing natural menopause (Stearns et al. 2006; Servayge et al. 2023).

Symptom burden and consequences

Commonly reported menopausal symptoms in breast cancer survivors include hot flushes, night sweats, sleep disturbance, vaginal dryness and dyspareunia, reduced libido, mood and cognitive changes, arthralgia, and fatigue (Hickey et al. 2008; Servayge et al. 2023). Symptom clusters may be particularly pronounced in the first years following diagnosis and initiation of endocrine therapy, with cumulative effects on daily functioning, intimate relationships, employment, and overall well-being (Mauri et al. 2020; Servayge et al. 2023). Poorly controlled vasomotor, musculoskeletal, and genitourinary symptoms have been associated with reduced adherence and early discontinuation of endocrine therapy in observational studies, potentially affecting long-term treatment continuity (Hershman et al. 2010).

In addition to symptomatic burden, breast cancer survivors exposed to prolonged oestrogen deprivation face increased risks of osteoporosis, cardiovascular disease, and metabolic disturbances, necessitating long-term preventive strategies, lifestyle interventions, and careful optimisation of pharmacotherapy (Stearns et al. 2006; Mauri et al. 2020). These layered needs underscore the importance of coordinated survivorship care and regular medication review.

Treatment options: implications for pharmacy practice

Non-hormonal pharmacological therapies

Non-hormonal agents are central to the management of vasomotor symptoms in breast cancer survivors because systemic oestrogen therapy is generally contraindicated in hormone receptor-positive disease (Servayge et al. 2023; Faubion et al. 2023). Selective serotonin reuptake inhibitors and serotonin–noradrenaline reuptake inhibitors

Table 1. Epidemiology of breast cancer and treatment-induced menopause in premenopausal women.

Population	Age range (years)	Treatment/regimen	Outcome (amenorrhoea/ovarian failure)
Global breast cancer incidence (women < 50 years as a proxy for premenopausal)	< 50	–	Approximately 20–25% of new breast cancer cases occur in women < 50 years; age-standardised incidence rates in Western Europe ≈ 35–40 per 100,000 (Heer et al. 2020).
Young breast cancer cohort (alkylating regimens)	< 40 vs. ≥ 40	CMF/CEF/CAF (alkylating-agent–containing regimens)	High risk of permanent ovarian failure, strongly age-dependent; rates frequently exceed 70–80% in women ≥ 40 years and are substantially lower but still significant in women < 40 (Stearns et al. 2006; Mauri et al. 2020; Himpe et al. 2023).
Young breast cancer cohort (anthracycline-based)	< 40 vs. ≥ 40	Doxorubicin–cyclophosphamide (AC) or similar	Intermediate gonadotoxic risk; amenorrhoea and permanent menopause increase with age and cumulative cyclophosphamide exposure (Stearns et al. 2006; Mauri et al. 2020).
Prospective young survivor cohort	≤ 40	Contemporary adjuvant chemotherapy (mixed regimens)	Chemotherapy-related amenorrhoea is observed in ~90% during or after treatment; ~40–50% progress to permanent menopause over follow-up (Liem et al. 2015).
Premenopausal women receiving ovarian function suppression (OFS) ± oophorectomy	18–50	GnRH agonists ± surgical oophorectomy + endocrine therapy	Iatrogenic menopause is expected; a high prevalence of vasomotor and sexual symptoms is reported in OFS-treated populations (Mauri et al. 2020; Himpe et al. 2023).

AC, doxorubicin–cyclophosphamide; CAF, cyclophosphamide, doxorubicin, fluorouracil; CEF, cyclophosphamide, epirubicin, fluorouracil; CMF, cyclophosphamide, methotrexate, fluorouracil; GnRH, gonadotropin-releasing hormone; OFS, ovarian function suppression.

– including venlafaxine, citalopram, escitalopram, and paroxetine – have demonstrated reductions in hot flush frequency and severity in randomised trials, although paroxetine and fluoxetine are potent CYP2D6 inhibitors and may reduce the bioactivation of tamoxifen (Faubion et al. 2023). Gabapentin and pregabalin represent alternative options, particularly for nocturnal vasomotor symptoms, but are associated with dizziness, somnolence, and additive central nervous system effects (Faubion et al. 2023).

Other agents, including clonidine and oxybutynin, have supportive evidence but are limited by adverse effect profiles and therefore require individualised risk–benefit assessment (Faubion et al. 2023). More recently, neurokinin-3 receptor antagonists such as fezolinetant have been authorised in Europe for the treatment of moderate to severe vasomotor symptoms associated with menopause, with specific hepatic monitoring and drug–interaction precautions outlined in regulatory guidance (European Medicines Agency 2024).

Although pharmacists do not independently prescribe these medications in Bulgaria, they could support prescribers by identifying appropriate therapeutic options, screening for contraindications and drug–drug interactions (including CYP-mediated interactions), verifying dosing against available evidence, and reinforcing monitoring requirements. When off-label use is being considered, pharmacists can assist in clarifying the evidence base, documenting the rationale in accordance with local policy, and supporting ongoing assessment of tolerability and patient-reported outcomes (Faubion et al. 2023; European Medicines Agency 2024).

The principal non-hormonal pharmacological options for the management of vasomotor symptoms in breast cancer survivors, together with typical dosing ranges, safety considerations, and key interaction risks relevant to oncology practice, are summarised in Table 2.

Data summarised from NCCN Guidelines® Insights: Survivorship, Version 2.2025, and recent position statements and clinical reviews on non-hormonal management of vasomotor symptoms in general menopausal and breast cancer survivor populations (Faubion et al. 2023; Servayge et al. 2023; European Medicines Agency 2024; Sanft et al. 2025).

Local hormonal and non-hormonal vaginal therapies

Genitourinary syndrome of menopause

Genitourinary syndrome of menopause, including vaginal dryness, dyspareunia, and recurrent urinary symptoms, is highly prevalent and frequently underreported among breast cancer survivors (Faubion et al. 2023; Servayge et al. 2023). Non-hormonal vaginal moisturisers and lubricants are recommended as first-line therapies, and pharmacists can provide counselling on product selection, correct application, and realistic expectations regarding symptom relief.

In selected survivors with persistent or severe symptoms, some guidelines permit cautious use of low-dose local vaginal oestrogen following multidisciplinary discussion and shared decision-making (Servayge et al. 2023). Such decisions require careful consideration of potential systemic absorption, individual oncological risk profile, and ongoing monitoring. Pharmacists can support prescribers by reviewing product selection, confirming appropriate strength and dosing, minimising duplication with other hormone-containing therapies, and reinforcing follow-up and documentation requirements. Where licensed products are unsuitable, compounding may be considered in accordance with national regulatory standards and quality assurance requirements, although evidence supporting compounded preparations in this context remains limited.

Non-pharmacological interventions

Non-pharmacological strategies play an important complementary role in symptom management. Evidence supports cognitive behavioural therapy for vasomotor symptoms and sleep disturbance, with moderate evidence for structured exercise and weight management in improving overall well-being (Faubion et al. 2023). Mind–body interventions such as relaxation-based therapies may provide benefits for some women, although effect sizes vary across studies.

For genitourinary symptoms, pelvic floor physiotherapy and sexual counselling can complement pharmacological strategies and address dyspareunia and relationship concerns (Servayge et al. 2023). Pharmacists embedded within oncology or survivorship services can reinforce these approaches, provide brief evidence-based guidance, and signpost patients to appropriate specialised services and reliable information resources.

Current and potential roles of clinical pharmacists

Professional bodies, including the European Society of Clinical Pharmacy and the International Society of Oncology Pharmacy Practitioners, emphasise the integration of clinical pharmacists within multidisciplinary oncology teams, with defined responsibilities in medication optimisation, pharmacovigilance, patient counselling, and supportive care. These competency frameworks endorse structured medication review and proactive symptom assessment as core elements of oncology pharmacy practice. Within this scope, systematic enquiry about menopausal symptoms and optimisation of non-hormonal treatment strategies are consistent with the established role of clinical pharmacists in cancer survivorship services.

Oncology and survivorship clinics

In hospital and specialist oncology settings, pharmacists routinely review systemic anticancer therapy, supportive medications, and treatments for comorbid conditions,

Table 2. Non-hormonal management options for vasomotor symptoms (VMS) in breast cancer survivors.

Intervention/class	Typical dose/ approach	Evidence for VMS reduction	Key adverse effects/ limitations	Important cautions	Clinical considerations in breast cancer survivors
SSRIs/SNRIs	Venlafaxine 37.5–75 mg/day; citalopram 10–20 mg/day; escitalopram 10–20 mg/day; paroxetine 7.5–12.5 mg/day	Moderate reduction in hot flush frequency and severity in randomised trials (often ~40–60% relative reduction vs. placebo)	Nausea, insomnia, headache, sexual dysfunction, hyponatraemia	Paroxetine and fluoxetine strongly inhibit CYP2D6 and may reduce tamoxifen activation	Frequently used first-line when systemic MHT is contraindicated; prefer venlafaxine, citalopram, or escitalopram in tamoxifen-treated patients
Gabapentin	300–900 mg/day (often initiated at 300 mg nocte and titrated)	Reduces VMS frequency, particularly beneficial for nocturnal symptoms	Dizziness, somnolence, ataxia, peripheral oedema	Additive CNS depression with opioids, benzodiazepines, and other sedatives	Useful when night-time symptoms predominate or neuropathic pain co-exists
Pregabalin	75–150 mg/day in divided doses	Similar efficacy to gabapentin in smaller trials	Dizziness, somnolence, weight gain, peripheral oedema	Renal dose adjustment required	Alternative to gabapentin; monitor sedation and weight gain
Clonidine	0.05–0.1 mg twice daily (oral) or transdermal patch	Modest reduction in hot flush frequency; smaller effect size than SSRIs/ SNRIs	Dry mouth, constipation, hypotension, dizziness	Caution in patients with hypotension or on antihypertensives	Generally reserved for patients unsuitable for other therapies
Oxybutynin	2.5–5 mg twice daily (immediate release)	Reduces VMS frequency and severity in small randomised studies	Dry mouth, constipation, urinary retention, cognitive effects	Strong anticholinergic; avoid high cumulative anticholinergic burden	May be useful in women with co-existing overactive bladder; monitor cognition
Fezolinetant	45 mg once daily	Significant reduction in moderate-to-severe VMS in phase III trials; rapid onset within weeks	Headache, abdominal pain, nausea, diarrhoea; transient liver enzyme elevations	Contraindicated with strong CYP1A2 inhibitors; baseline and periodic liver function monitoring required	Non-hormonal option where MHT is contraindicated; limited breast cancer–specific data – use in consultation with oncology and current guidelines
Lifestyle/CBT (non-drug options)	Cognitive behavioural therapy (structured programmes); weight management; regular exercise; paced breathing; relaxation-based interventions	CBT has demonstrated improvement in VMS bother and sleep; exercise and weight management may improve overall symptom burden and well-being	Effect sizes vary; requires patient engagement and access to trained providers	Evidence is stronger for CBT than for breathing or relaxation alone	Recommended as adjunctive strategies, particularly valuable when pharmacotherapy is contraindicated or poorly tolerated

Abbreviations: CBT, cognitive behavioural therapy; CNS, central nervous system; CYP1A2, cytochrome P450 1A2; CYP2D6, cytochrome P450 2D6; MHT, menopausal hormone therapy; NK3, neurokinin-3; SNRI, serotonin–noradrenaline reuptake inhibitor; SSRI, selective serotonin reuptake inhibitor; VMS, vasomotor symptoms.

providing a structured opportunity to identify and address menopause-related symptoms within routine care. Survivorship guidelines recommend systematic assessment of treatment-related symptoms, including vasomotor, sexual, and psychological concerns, as part of comprehensive follow-up care (Runowicz et al. 2016; Sanft et al. 2025). Pharmacists can incorporate focused symptom enquiry into medication reviews, exploring hot flushes, sleep disturbance, mood changes, sexual health, and urogenital complaints and linking these to appropriate pharmacological and non-pharmacological options.

Published reports of pharmacist-led oncology interventions – although not primarily focused on menopause – demonstrate that pharmacist involvement in symptom assessment, patient education, and follow-up can improve treatment tolerability, medication optimisation, and adherence in cancer populations (Neuner et al. 2022). Extrapolating from these models, structured pharmacist engagement in the assessment of vasomotor and genitourinary symptoms may help rationalise non-hormonal therapy selection, identify interaction risks, and support sustained treatment use, although menopause-specific outcome data remain limited.

Pharmacists can also address common misperceptions (for example, that all vaginal products are unsafe or ineffective in breast cancer survivors) and clarify

recommendations from oncology and menopause guidelines, thereby supporting informed and shared decision-making (Faubion et al. 2023; Servayge et al. 2023). Within multidisciplinary teams, they contribute by identifying drug–drug interaction risks, reviewing cumulative pill burden, and highlighting adherence challenges when considering changes to endocrine or supportive therapies.

A scoping review evaluated the impact of clinical pharmacist-led interventions in breast cancer management. The authors identified several important roles performed by pharmacists, including patient education, medication review, detection of drug–drug interactions, monitoring adverse drug reactions, and optimisation of chemotherapy regimens. The review concluded that pharmacist involvement contributes to improved treatment adherence, reduced medication errors, and enhanced quality of life among breast cancer patients (Staynova et al. 2024).

Primary care and community pharmacy

In many European healthcare systems, after initiation of endocrine therapy (such as aromatase inhibitors or gonadotropin-releasing hormone agonists), follow-up with oncology specialists may become less frequent, with ongoing prescription renewal and interim management transitioning to primary care. As a result, community pharmacists are often among the most accessible healthcare professionals for medicine-related queries and symptom discussions during survivorship (Runowicz et al. 2016; Sanft et al. 2025).

Within this setting, community pharmacists can provide opportunistic assessment of treatment-related adverse effects, including vasomotor symptoms, musculoskeletal complaints, and genitourinary concerns, particularly when dispensing endocrine therapy or bone-protective agents. Structured questioning may help identify severe or refractory menopausal symptoms, adherence challenges, or safety concerns, prompting referral to general practitioners or oncology teams when necessary. Although menopause-specific pharmacist-led survivorship models in community settings remain underreported, broader oncology pharmacy literature supports pharmacist involvement in medication optimisation, side-effect assessment, and interprofessional collaboration (Holle and Ignoffo 2020; Taleb et al. 2025).

In countries where pharmacists are embedded within primary care or structured clinical services, survivorship-focused medication consultations could incorporate standardised enquiries regarding menopausal symptoms, bone health, and cardiovascular risk, with coordination and referral to gynaecology, psychology, physiotherapy, or sexual health services, consistent with survivorship care frameworks (Runowicz et al. 2016; Sanft et al. 2025).

Digital health tools and telehealth-based consultations provide additional opportunities for longitudinal monitoring of menopausal symptoms and treatment-related concerns in breast cancer survivors. Scoping reviews demonstrate that digital and telehealth interventions in oncology are feasible and acceptable, with positive effects reported for quality of life and psychological outcomes, although heterogeneity in intervention design and outcome reporting remains (Aapro et al. 2020; Shaffer et al. 2023; Lazarou et al. 2024). In this context, pharmacists may contribute to digital survivorship pathways by supporting remote symptom monitoring, reinforcing education, and facilitating timely escalation of care where required.

The contribution of clinical pharmacists to menopause-focused survivorship care varies across healthcare settings and national regulatory frameworks. However, common core functions include structured medication review, symptom assessment, identification of drug–drug interactions, and coordination with multidisciplinary teams. Table 3 summarises potential setting-specific roles of pharmacists in hospital, ambulatory, and community contexts, highlighting menopause-specific tasks, referral pathways, and practical tools used in routine care.

The scope of practice of clinical pharmacists varies across countries. In some European settings (including Bulgaria), clinical pharmacists are predominantly hospital-based and do not have independent prescribing authority. In other jurisdictions, pharmacists may be embedded in primary care or community services and may deliver more structured medication review and survivorship support within collaborative practice models.

Education, guideline implementation, and research

Clinical pharmacists are well positioned to support implementation of oncology and menopause management guidance in breast cancer survivorship through the development of local protocols, medicines information resources, and structured decision-support tools tailored to women experiencing treatment-induced menopausal symptoms. Within oncology practice, pharmacists routinely educate patients about expected therapeutic effects and adverse effects of systemic treatments, assess drug–drug interactions relevant to endocrine therapies, and could provide evidence-based information regarding non-hormonal options for vasomotor and genitourinary symptoms (Faubion et al. 2023; Servayge et al. 2023).

Although menopause-specific pharmacist-led outcome studies remain limited, broader oncology pharmacy literature indicates that pharmacist involvement in medication review, patient counselling, and structured follow-up can improve treatment optimisation, safety monitoring, and adherence in cancer populations (Holle and Ignoffo 2020; Neuner et al. 2022). Extrapolating from these models, structured pharmacist engagement in menopause-focused survivorship care may enhance symptom assessment and support continuity of therapy, but prospective, menopause-specific evaluations are needed.

Scoping reviews of pharmacist involvement in breast cancer care highlight roles in medication optimisation, patient education, and multidisciplinary collaboration, while identifying the need for well-designed prospective studies assessing impacts on symptom control, quality of

Table 3. Setting-specific roles of clinical pharmacists in supporting menopausal symptoms among breast cancer survivors.

Care setting	Core activities	Menopause-specific tasks	Main referral targets	Tools/resources used
Hospital oncology clinic	Comprehensive medication review; verification of anticancer and supportive regimens; toxicity and interaction monitoring; patient counselling	Structured enquiry regarding vasomotor, genitourinary, sleep, and mood symptoms; identification of endocrine therapy-related adverse effects; optimisation of non-hormonal therapies in collaboration with prescribers; counselling on safe use of local vaginal treatments	Medical oncologist; gynaecologist; psycho-oncology/psychology services; specialist menopause clinic	Hospital electronic health record (EHR); chemotherapy protocols; oncology and menopause guidelines; structured symptom assessment tools
Day hospital/ infusion centre	Chair-side medicines review; management of acute treatment-related adverse effects; reinforcement of treatment plans	Brief screening for hot flushes, sleep disturbance, mood changes, and musculoskeletal symptoms; reinforcement of non-pharmacological strategies; identification of red flags requiring escalation	Oncology clinic; supportive care or palliative care team; psycho-oncology services	Infusion centre documentation systems; patient-reported outcome tools; educational materials
Primary care (where applicable)	Medication reconciliation between oncology and general practice records; chronic disease management; deprescribing where appropriate	Review of ongoing non-hormonal therapies for vasomotor symptoms; assessment of polypharmacy and interaction risk; support for lifestyle and preventive strategies (bone and cardiovascular health)	General practitioner; community mental health services; physiotherapy; dietetics; menopause or sexual health services	Primary care EHR; shared care plans; national primary care and survivorship guidelines
Community pharmacy	Dispensing of endocrine therapy, bone-protective, and supportive medicines; over-the-counter advice; adherence support	Opportunistic identification of troublesome menopausal symptoms and adherence challenges; counselling on non-hormonal vaginal moisturisers and lubricants; signposting for medical review where needed	General practitioner or oncology clinic; gynaecologist; specialised menopause or sexual health services	Pharmacy dispensing system; structured questioning prompts; patient information leaflets; national pharmacy guidance

life, adherence, and healthcare utilisation. Such research would provide the evidence base required to standardise and commission pharmacist-delivered menopause support services within oncology and primary care systems.

Barriers, enablers, and future directions

Key barriers to pharmacist involvement in menopause-focused survivorship care include limited consultation time, absence of dedicated reimbursement mechanisms, and variability in access to structured specialist training. These factors have been widely identified in the broader literature as constraints on implementation of expanded clinical pharmacy services within oncology and primary care settings (Holle and Ignoffo 2020). In addition, evolving and sometimes divergent clinical guidelines may create uncertainty in interpretation and operationalisation within routine practice, particularly in complex areas such as the management of menopausal symptoms in hormone receptor-positive breast cancer.

In settings such as Bulgaria, pharmacists do not have independent prescribing authority, meaning that pharmacological management must occur through medical doctors, with pharmacists providing advisory and supportive input rather than initiating or modifying therapy. Restrictions on prescribing scope are recognised internationally as influencing the extent to which pharmacist-led clinical services can be developed. Fragmented communication between oncology, primary care, and community pharmacy settings may further impede coordinated survivorship care, potentially leading to inconsistent messaging and missed opportunities to optimise symptom management and adherence.

Additional complexity arises at the interface between oncology and gynaecology services. Gynaecologists managing menopausal symptoms may not routinely encounter patients receiving long-term endocrine therapy for breast cancer and may be less familiar with oncology-specific considerations such as tamoxifen metabolism, aromatase inhibitor–related adverse effects, or contraindications to systemic hormone therapy. In this context, structured communication between gynaecologists, oncologists, and clinical pharmacists is essential to ensure consistent messaging, avoidance of contraindicated therapies, and alignment with oncological risk profiles. Clinical pharmacists, given their expertise in pharmacotherapy and drug–drug interactions, are well positioned to facilitate this cross-specialty communication and to support shared decision-making grounded in both menopause and oncology guidance.

Key enablers for pharmacist involvement include integration within multidisciplinary oncology and survivorship teams, supported by clear referral pathways and structured communication processes (American Society of Clinical Oncology 2016; Runowicz et al. 2016; Sanft et al. 2025). Development of targeted education and competency frameworks in oncology-related menopause care would strengthen pharmacists' ability to advise on non-hormonal symptom management, endocrine therapy

interactions, and long-term bone and cardiovascular risk mitigation. Shared electronic health records and digital survivorship tools may further enhance coordinated and longitudinal care (Shaffer et al. 2023).

Future priorities include defining core components of pharmacist-delivered menopause support packages for breast cancer survivors, incorporating structured symptom assessment, patient education, and ongoing monitoring. Validation of practical assessment tools suitable for pharmacy settings and prospective evaluation of clinical outcomes, cost-effectiveness, and patient-reported outcomes are needed. Collaboration between oncologists, primary care specialists, and pharmacy professional bodies will be essential to embed menopause-focused pharmaceutical care within guidelines and routine survivorship pathways.

This narrative review has several limitations that should be acknowledged. First, the literature search was conducted exclusively using MEDLINE (PubMed), which may have resulted in the omission of relevant studies indexed in other databases; the comprehensiveness of the included evidence may therefore be limited.

Second, as a narrative review, this study does not follow a fully systematic methodology and may therefore be subject to selection bias in the inclusion and interpretation of the literature. The absence of a structured quality appraisal framework further limits the ability to formally assess the strength of the evidence. Additionally, the included studies demonstrate heterogeneity in study design, sample size, and outcome measures, which complicates direct comparisons and limits the generalisability of findings. Many studies in this field involve relatively small sample sizes or observational designs, which may reduce the robustness of conclusions. Finally, variability in clinical settings, patient populations, and interventions may influence the applicability of the findings to broader clinical practice.

Despite these limitations, this review provides a comprehensive overview of the current evidence and highlights the important role of clinical pharmacists in managing menopausal symptoms in breast cancer survivors.

Conclusion and practical implications for clinical pharmacy

For practising clinical pharmacists, this review highlights several practical roles in supporting breast cancer survivors experiencing menopausal symptoms:

- Routinely enquire about menopausal symptoms when reviewing endocrine or supportive therapies, using brief structured questions to identify vasomotor, genitourinary, and psychosocial concerns.
- Support optimisation of non-hormonal pharmacotherapy by reviewing treatment options, screening for drug–drug interactions with endocrine therapies, and providing structured recommendations to the responsible prescriber, while collaborating in monitoring effectiveness and tolerability.
- Provide balanced counselling on local hormonal therapies and non-pharmacological strategies, aligned with oncology guidance and individual patient preferences.
- Collaborate within multidisciplinary teams to promote consistent messaging, timely referral, and coordinated survivorship care planning, while documenting pharmaceutical care activities.

As breast cancer survivorship continues to expand, treatment-related menopausal symptoms represent a clinically significant and often under-recognised challenge across care settings. Embedding menopause-focused pharmaceutical care within oncology and survivorship pathways offers a structured and scalable opportunity to strengthen symptom assessment, optimise non-hormonal management, and support safe, individualised care. Given the complexity of endocrine therapies and evolving menopause guidance, effective coordination between oncologists, gynaecologists, primary care clinicians, and clinical pharmacists is essential to ensure consistent recommendations, minimise therapeutic risk, and avoid fragmented messaging. Within this multidisciplinary framework, clinical pharmacists can contribute pharmacotherapeutic expertise, structured medication review, and cross-speciality communication, thereby supporting integrated and patient-centred survivorship care for women living with and beyond breast cancer.

Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statements

This article is a narrative review based exclusively on previously published literature. No primary data were collected, and no human participants or identifiable patient information were involved. Therefore, ethical approval was not required.

Use of AI

The authors accept full responsibility for the content of the manuscript, including the disclosure of any use of AI. No AI tools were used in the preparation of this manuscript.

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Data availability

No new data were generated or analysed in this study.

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