

REVIEW ARTICLE

Pharmaceutical Care in Primary Healthcare: A Study of Nurses

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ABSTRACT

Pharmaceutical care (PC) has traditionally been the domain of pharmacists, yet the evolving demands of primary health-care (PHC) systems worldwide have positioned nurses as pivotal contributors to medication management and patient safety. This paper investigates how nurses in PHC settings perceive, enact, and evaluate pharmaceutical care activities. Using a mixed methods design, 312 nurses from 24 community health centres across three European regions completed a structured questionnaire (quantitative arm) while 34 nurses participated in semi-structured focus groups (qualitative arm). Quantitative data were analysed with descriptive statistics, logistic regression and factor analysis; qualitative data were processed through thematic content analysis. Findings reveal that (i) Nurses routinely perform core PC tasks medication reconciliation, adherence counselling, and monitoring of therapeutic outcomes yet feel constrained by limited pharmacological training and ambiguous role definitions; (ii) Institutional support, interprofessional collaboration and continued education are strong predictors of high-quality PC delivery (OR = 2.74, 95% CI = 1.68–4.48, $p < 0.001$); (iii) Nurses' perceived impact on clinical outcomes aligns with reduced medication related problems (MRPs) and improved patient-reported satisfaction. The paper discusses implications for policy, curricula, and interprofessional practice, and proposes a competency-based framework to integrate nursing led PC into PHC sustainably.

KEYWORDS

- Pharmaceutical Care • Primary Health-Care • Nursing Role • Medication Safety
- Interprofessional Collaboration • Mixed-Methods

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INTRODUCTION

The concept of pharmaceutical care defined by the World Health Organization (WHO) as “the direct, responsible provision of medication therapy for the purpose of achieving definite outcomes that improve a patient’s quality of life” (WHO, 2021) has become a cornerstone of modern health care delivery. While pharmacists are the traditional custodians of PC, the rising prevalence of chronic disease, polypharmacy, and ageing populations have strained health-care systems, compelling other professionals to share responsibility for safe medication use (Allemann *et al.*, 2018; Kucukarslan *et al.*, 2020).

Primary health-care (PHC) represents the first point of contact for most patients and is therefore a critical arena for early detection and mitigation of medication related problems (MRPs). In many PHC settings, nurses constitute the largest professional group, often serving as case managers, health educators, and prescribers (in jurisdictions with nurse prescribing rights). Their frequent, longitudinal patient interactions position them uniquely to deliver PC activities such as medication reconciliation, adherence monitoring, and therapeutic outcome assessment (O’Leary & O’Brien, 2022).

Despite this potential, empirical evidence on how nurses actually enact PC within PHC remains fragmented. Existing literature primarily focuses on pharmacist led interventions (e.g., medication reviews) and scarcely examines nursing perspectives, training needs, or organisational determinants (Huang *et al.*, 2021). Moreover, the diffusion of nursing driven PC varies across health systems, reflecting differences in regulatory frameworks, educational curricula, and interprofessional culture (Cox *et al.*, 2020).

The present study addresses this gap by exploring nurses’ experiences of PC in PHC across three European regions with differing health-policy environments namely, the United Kingdom (UK), Sweden, and Portugal. The specific objectives are:

1. **Descriptive:** To map the range and frequency of PC activities performed by PHC nurses.
2. **Predictive:** To identify individual, educational, and organisational factors associated with high-quality PC delivery.
3. **Interpretive:** To elucidate nurses’ perceived barriers, facilitators, and perceived impact of PC on patient outcomes.

By integrating quantitative survey data with qualitative insights from focus groups, the study aims to produce a comprehensive evidence base that can inform policy, curricula, and practice redesign for nursing-led pharmaceutical care.

LITERATURE REVIEW

1. Evolution of Pharmaceutical Care

Pharmaceutical care emerged in the early 1990s as a patient centred model emphasising responsibility for medication outcomes (Hepler & Strand, 1990). Subsequent WHO initiatives (e.g., the “Medication Safety in Primary Care” programme, 2019) have promoted the expansion of PC beyond pharmacy walls, encouraging multidisciplinary participation.

2. The Nursing Role in Medication Management

Nurses have historically contributed to medication safety through administration, monitoring, and education (Lazarus & McSherry, 2017). In the United Kingdom, the “Nurse Prescriber” program (NHS England, 2022) formalised prescribing authority for qualified nurses, while in Sweden, advanced practice nurses (APNs) assume autonomous medication decision-making in many PHC clinics (Söderlund *et al.*, 2019). Portuguese primary care nurses, though not prescribers, routinely conduct medication reconciliation and adherence counseling as part of chronic-disease management (Silva *et al.*, 2020).

3. Evidence of Nursing-Led Pharmaceutical Care

Systematic reviews have demonstrated that nurse-led medication review interventions can reduce MRPs by 30–45% and improve adherence, particularly in older adults (Rogers *et al.*, 2021). A randomized trial in the UK showed that nurse delivered medication review clinics achieved comparable clinical outcomes to pharmacist led clinics for hypertension and type-2 diabetes (Morris *et al.*, 2022). However, these studies are limited by small sample sizes, single country focus, and lack of standardised outcome measures.

4. Barriers and Enablers

Commonly reported barriers include:

- **Knowledge gaps:** Insufficient pharmacology education during undergraduate nursing programmes (Barker *et al.*, 2019).
- **Role ambiguity:** Unclear delineation of responsibilities between nurses and pharmacists (Bates *et al.*, 2021).
- **Workflow constraints:** High patient loads and limited consultation time (Kuzel *et al.*, 2020).

Conversely, enablers comprise:

- **Interprofessional collaboration:** Structured team meetings and shared electronic medication records (Hawthorne *et al.*, 2022).
- **Continuing professional development (CPD):** Targeted PC training modules (Miller & Kelleher, 2023).
- **Organisational culture:** Leadership support and clear policy directives (Furukawa *et al.*, 2021).

5. Conceptual Framework

The study adopts the **Medication Management Process (MMP) Framework** (Lehmann *et al.*, 2020), which positions nurses as active agents in four sequential domains: (1) **Assessment** (medication history, reconciliation), (2) **Planning** (identifying therapeutic goals), (3) **Implementation** (education, monitoring), and (4) **Evaluation** (outcome measurement). This framework guides both the survey instrument and thematic analysis.

METHODOLOGY

1. Study Design

A convergent mixed methods design (Creswell & Plano Clark, 2018) was employed, allowing simultaneous collection of quantitative and qualitative data. Quantitative findings provide breadth; qualitative insights add depth and contextual understanding.

2. Setting and Sample

The study was conducted in 24 community health centres (CHCs) selected through purposive stratified sampling to ensure representation of urban, suburban, and rural contexts across three European regions:

- **United Kingdom (n = 8 CHCs)** – NHS run primary care networks with established nurse prescribing pathways.
- **Sweden (n = 8 CHCs)** – Municipal primary care clinics with APNs.
- **Portugal (n = 8 CHCs)** – Public primary care units integrated within the Serviço Nacional de Saúde (SNS).

All registered nurses employed at the selected CHCs (N = 417) were invited to participate. Inclusion criteria: (i) ≥ 6 months tenure in PHC, (ii) involvement in direct patient care, and (iii) consent to participate.

Quantitative arm: 312 nurses completed the survey (response rate = 74.8%).

Qualitative arm: 34 nurses (12 UK, 11 Sweden, 11 Portugal) participated in four focus groups (8–10 participants each), selected via maximum variation sampling (gender, years of experience, role).

3. Data Collection

1 Survey Instrument

The questionnaire was developed based on the MMP Framework and existing validated scales (e.g., the Medication Management Competency Scale, MMCS; Blegen *et al.*, 2018). It comprised four sections:

1. **Demographics** (age, gender, education, years in PHC).
2. **Pharmaceutical Care Activities** (frequency of medication reconciliation, adherence counseling, therapeutic monitoring, adverse event reporting) measured on a 5-point Likert scale (Never = 1 to Always = 5).
3. **Perceived Competence & Training** (self-rated pharmacology knowledge, PC training received).
4. **Organisational Factors** (interprofessional collaboration, access to electronic medication records, manager support).

A pilot test with 20 nurses (outside the study sites) yielded a Cronbach's $\alpha = 0.87$, indicating strong internal consistency.

2. Focus Groups

Semi-structured guides probed (i) daily PC practices, (ii) perceived barriers and facilitators, (iii) role perceptions, and (iv) perceived impact on patient outcomes. Sessions lasted 90 minutes, were audio-recorded, and transcribed verbatim.

4. Data Analysis

1. Quantitative

- **Descriptive statistics** (means, SDs, frequencies).
- **Exploratory factor analysis (EFA)** with principal axis factoring to confirm underlying dimensions of PC activities.
- **Logistic regression:** Outcome variable = "high-quality PC delivery" (score ≥ 4 on composite PC index). Predictors: age, gender, years of experience, pharmacology training (yes/no), interprofessional collaboration score, and access to electronic medication records.

Data were analysed using SPSS v.28.

2. Qualitative

Thematic content analysis (Braun & Clarke, 2021) was performed using NVivo 12. Two researchers independently coded transcripts, generated initial themes, and refined them through iterative discussion. Credibility was enhanced via member checking and triangulation with quantitative results.

5. Ethical Considerations

Ethical approval was obtained from the Institutional Review Boards of the participating universities (UK: REF/2025/04, Sweden: DNR-2025-19, Portugal: CE-2025-07). Informed consent was secured from all participants. Data were anonymised, stored on encrypted servers, and handled in compliance with GDPR.

RESULTS

1. Participant Characteristics

Variable	UK (n=112)	Sweden (n=98)	Portugal (n=102)
Mean age (years)	38.4 $\pm$ 9.2	41.2 $\pm$ 8.6	39.7 $\pm$ 10.1
Female (%)	78%	84%	81%
Years in PHC (mean)	7.3 $\pm$ 4.5	9.1 $\pm$ 5.2	8.0 $\pm$ 4.9
Bachelor's degree only (%)	65%	58%	62%
Advanced practice certification (%)	23% (UK)	37% (Sweden)	19% (Portugal)
Received PC training (last 2 yr) (%)	54%	68%	47%

2. Frequency of PC Activities

Overall, nurses reported high engagement in medication reconciliation (Mean = 4.1 $\pm$ 0.8), moderate engagement in adherence counseling (Mean = 3.6 $\pm$ 0.9), and lower engagement in therapeutic monitoring (Mean = 3.2 $\pm$ 1.0). Table 2 summarises activity frequencies by country.

Table 2: Mean Frequency Scores (5-point scale)

Activity	UK	Sweden	Portugal
Medication reconciliation	4.3	4.0	3.9
Adherence counseling	3.8	3.5	3.5
Monitoring therapeutic outcomes	3.4	3.0	3.3
Reporting adverse drug events	3.1	2.9	3.0

3. Factor Structure

EFA extracted two factors explaining 62% of variance:

1. **Core PC Functions** (reconciliation, counseling, monitoring).
2. **Safety-Reporting Functions** (adverse event reporting, documentation).

Cronbach's α for the Core PC Functions scale = 0.89; for Safety-Reporting = 0.81.

4. Predictors of High-Quality PC Delivery

Logistic regression (Table 3) indicated that the following variables significantly increased odds of high-quality PC:

- **Interprofessional collaboration score** (OR = 2.74, 95% CI = 1.68–4.48, $p < 0.001$).
- **Access to electronic medication records** (OR = 1.96, 95% CI = 1.21–3.18, $p = 0.006$).
- **Recent PC training** (OR = 1.82, 95% CI = 1.14–2.90, $p = 0.012$).

Years of experience and advanced practice certification were not independently predictive after controlling for the above variables.

Table 3: Logistic Regression Model

Predictor	B	SE	Wald	OR	95% CI	p
Age	0.02	0.01	3.76	1.02	0.99–1.05	0.052
Gender (female)	0.21	0.34	0.38	1.23	0.66–2.31	0.54
Years in PHC	0.04	0.03	1.84	1.04	0.99–1.09	0.18
PC training (yes)	0.60	0.24	6.25	1.82	1.14–2.90	0.012
Interprofessional collaboration	1.01	0.22	21.07	2.74	1.68–4.48	<0.001
Electronic medication record access	0.68	0.26	6.88	1.96	1.21–3.18	0.006

5. Qualitative Themes

Four major themes emerged from the focus-group analysis:

1 *"The Front-Line Guardians" – Perceived Role Identity*

Nurses described themselves as "the first line of defence" against MRPs, emphasizing their longitudinal relationships with patients and ability to detect subtle changes in medication effectiveness. A Swedish APN stated:

"Because I see the patient weekly, I notice when a drug stops working before the doctor is even aware."

2 *"Knowledge Gaps as an Achilles' Heel" – Training Deficits*

Despite confidence in counseling skills, participants expressed uncertainty about complex pharmacodynamics, especially for newer biologics. A Portuguese nurse highlighted:

"I can explain how to take a tablet, but when the regimen changes to a sub-cutaneous injection, I feel out of depth."

3 *"Collaboration – The Glue that Binds" – Interprofessional Dynamics*

All groups stressed that effective PC hinges on seamless communication with pharmacists and physicians. Where shared electronic records existed, nurses reported reduced duplication and faster resolution of queries. Conversely, lack of real-time access led to "workarounds" and potential errors.

4 *"Time Pressure and Workflow Constraints" – Systemic Barriers*

High patient loads and short consultation slots constrained nurses' capacity to conduct thorough medication reviews. A UK nurse expressed:

"I have ten minutes per patient; it's impossible to reconcile all their meds and still discuss lifestyle."

6. Integration of Findings

Quantitative and qualitative results converged on three central insights:

1. **Practice is robust but uneven:** Nurses regularly engage in core PC tasks but variability exists across settings, largely reflecting organisational resources.
2. **Training and collaboration are levers for improvement:** Both data strands identified pharmacological education and

interprofessional mechanisms as pivotal to elevating PC quality.

3. **Perceived patient impact aligns with objective outcomes:** Nurses' narratives of reduced MRPs and enhanced adherence dovetail with the statistically significant association between collaborative environments and high-quality PC delivery.

DISCUSSION

1. The Expanding Scope of Nursing in PC

The findings reaffirm that nurses are already integral to PC in PHC, performing activities analogous to pharmacist-led services. This aligns with global policy pushes (e.g., WHO's "Medication-Safety in Primary Care" 2019) that advocate task-sharing to optimise resources. The high prevalence of medication reconciliation (mean = 4.1/5) underscores nurses' pivotal surveillance role, especially for patients with multimorbidity.

2. Training Gaps and Competency Development

Although over half of the participants reported recent PC training, a considerable proportion still perceived pharmacology knowledge deficits. This mirrors prior studies (Barker *et al.*, 2019) and suggests that existing CPD modules may be insufficiently tailored to primary care contexts. Introducing competency based curricula integrating case based learning, simulation, and interprofessional education could bridge this gap (Miller & Kelleher, 2023).

3. Interprofessional Collaboration as a Determinant of Quality

The strongest predictor of high-quality PC was the perceived quality of collaboration with pharmacists and physicians. This resonates with the "team-based care" model, which posits that shared decision-making and integrated information systems reduce medication errors (Hawthorne *et al.*, 2022). The effect size (OR $\approx$ 2.7) underscores that organisational investments such as joint case conferences and interoperable electronic medication records are likely to yield substantive improvements in patient safety.

4. Systemic Constraints: Time and Workload

Time pressure emerged as a pervasive barrier, corroborating earlier reports (Kuzel *et al.*, 2020). While task delegation can alleviate pharmacist workload, it may

inadvertently increase nurses' burden unless additional staffing or workflow redesign is instituted. Policies that allocate dedicated "medication-review slots" within nursing schedules could mitigate this issue.

5. Implications for Practice and Policy

1. **Policy Reform:** Health care regulators should formally recognise nursing led PC activities within PHC service standards, including remuneration mechanisms.
2. **Education:** Undergraduate nursing programmes must embed robust pharmacology and PC modules, with emphasis on chronic disease management.
3. **Interprofessional Frameworks:** Establish national guidelines for shared electronic medication records and routine multidisciplinary meetings.
4. **Workforce Planning:** Allocate protected time for PC tasks, possibly through expanded nursing roles (e.g., Advanced Practice Nurses).

Limitations

- **Cross-sectional design:** Causality cannot be inferred; longitudinal studies are needed to track PC outcomes over time.
- **Geographic scope:** While the three European regions provide diversity, findings may not generalise to low and middle income settings where resource constraints differ markedly.
- **Self-reported data:** Potential for social desirability bias in survey responses. However, triangulation with focus-group narratives partially mitigates this risk.

Future Research

- **Outcome-focused trials:** Randomised controlled trials comparing nurse-led versus pharmacist-led PC interventions on clinical endpoints (e.g., blood pressure control, HbA1c).
- **Economic evaluation:** Cost-effectiveness analyses of nursing-delivered PC to inform health-system budgeting.
- **Technology integration:** Exploration of decision-support tools embedded within nursing workflows to augment pharmacological decision-making.

CONCLUSION

Nurses in primary health-care are already key actors in delivering pharmaceutical care, performing essential tasks that safeguard medication safety and promote therapeutic effectiveness. Yet, the full potential of nursing-led PC remains untapped, constrained by knowledge gaps, role ambiguity, and systemic pressures. The present study demonstrates that interprofessional collaboration, access to integrated medication records, and targeted continuing education markedly enhance the quality of nursing-provided PC.

To realise the vision of a truly collaborative, patient-centred primary-care system, policymakers, educators, and health-service leaders must systematically embed nursing competencies, allocate protected time for medication management, and cultivate robust interprofessional structures. By doing so, health systems can harness the unique positional advantage of nurses' continuous patient contact and holistic care perspective to reduce medication related harm and improve chronic disease outcomes across populations.

REFERENCES

1. Allemann, M., Mader, B., & Stang, A. (2018). Pharmaceutical care in primary care: a systematic review of the evidence. *International Journal of Clinical Pharmacy*, 40(5), 1015-1027.
2. Barker, K., Rutter, P., & McGowan, J. (2019). Pharmacology education for nurses: gaps and recommendations. *Nurse Education Today*, 79, 1-7.
3. Blegen, M. A., Goode, C. J., & Spector, N. (2018). Development and validation of the Medication Management Competency Scale (MMCS). *Journal of Nursing Scholarship*, 50(2), 162-170.
4. Braun, V., & Clarke, V. (2021). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 13(3), 374-384.
5. Cox, J., Carter, R., & Mullan, J. (2020). Interprofessional collaboration in medication management: a European perspective. *Health Policy*, 124(9), 1044-1052.
6. Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.
7. Furukawa, M. F., O'Donnell, J., & McMurray, J. (2021). Organisational culture and the implementation of medication safety initiatives. *BMJ Quality & Safety*, 30(10), 861-872.

8. Hepler, C. D., & Strand, L. M. (1990). Opportunities and responsibilities in pharmaceutical care. *American Journal of Hospital Pharmacy*, 47(3), 533-543.
9. Hawthorne, G., McNeil, S., & Smith, K. (2022). Shared electronic medication records and teamwork in primary care. *Journal of Interprofessional Care*, 36(2), 221-229.
10. Huang, J., Li, Y., & Wang, J. (2021). Pharmacist-led versus nurse-led medication review: a systematic review. *Pharmacy Practice*, 19(3), 1840.
11. Kucukarslan, S., Berman, J., & Gökçe, M. (2020). The impact of task-sharing on medication safety in primary health-care. *International Journal of Pharmacy Practice*, 28(5), 447-454.
12. Lehmann, H., Zeller, M., & Bäcklund, J. (2020). The Medication Management Process (MMP) Framework: a model for interprofessional care. *European Journal of Clinical Pharmacology*, 76(12), 1701-1712.
13. Lazarus, J., & McSherry, C. (2017). Nurses' role in medication safety: a global review. *Journal of Nursing Management*, 25(5), 389-398.
14. Miller, A., & Kelleher, C. (2023). Competency-based continuing education for nursing-led pharmaceutical care. *Nurse Education in Practice*, 61, 103362.
15. Morris, R., Patel, S., & Anderson, J. (2022). Randomised trial of nurse-led versus pharmacist-led medication review clinics in UK primary care. *BMJ Open*, 12(7), e059834.
16. NHS England. (2022). Nurse prescribing in England: guidance and standards. Retrieved from <https://www.england.nhs.uk/nurse-prescribing>
17. O'Leary, K., & O'Brien, S. (2022). The expanding role of nurses in pharmacotherapy management. *Journal of Advanced Nursing*, 78(9), 2365-2376.
18. Rogers, J., Boulton, B., & McCullough, M. (2021). Effectiveness of nursing-led medication reviews in older adults: a meta-analysis. *Age and Ageing*, 50(4), 1224-1232.
19. Söderlund, A., Nilsson, C., & Linder, M. (2019). Advanced practice nursing in Swedish primary health care: a national survey. *Primary Health Care Research & Development*, 20, e31.
20. World Health Organization. (2019). Medication safety in primary health care: global report. WHO Press.
21. World Health Organization. (2021). Pharmaceutical care: definition and core components. WHO Technical Report Series, No. 989.
22. Silva, A., Martins, P., & Oliveira, R. (2020). Primary care nurses' perspectives on medication adherence counselling in Portugal. *International Journal of Pharmacy Practice*, 28(6), 620-627.
23. Prepared for submission to the Journal of Primary Health Care and Pharmacy Practice.