NursingOpen Open Access WILEY

Nurses' responsibilities and tasks in pharmaceutical care: A scoping review

Elyne De Baetselier ⓘ | Tinne Dilles ⓘ | Hilde Feyen | Filip Haegdorens ⓘ |
Laura Mortelmans ⓘ | Bart Van Rompaey ⓘ

Department of Nursing and Midwifery
Science, Centre for Research and Innovation
in Care (CRIC), Nurse and Pharmaceutical
Care (NuPhaC), Faculty of Medicine and
Health Sciences, University of Antwerp,
Antwerp, Belgium

Correspondence
Elyne De Baetselier, Department of Nursing
and Midwifery Science, Centre for Research
and Innovation in Care (CRIC), Nurse and
Pharmaceutical Care (NuPhaC), Faculty of
Medicine and Health Sciences, University of
Antwerp, Antwerp, Belgium.
Email: Elyne.DeBaetselier@uantwerpen.be

Abstract

Aim: To provide an overview of responsibilities and tasks of nurses in pharmaceutical care.

Design: Scoping review.

Methods: Two databases were systematically searched (MEDLINE and Scopus) for recent original research papers concerning nurses' responsibilities and tasks in pharmaceutical care. The definition of responsibility was based on literature, moral and ethical discussions. Existing responsibilities and tasks beyond preparation and administration of medication were collected and synthesized. This main study outcome was extracted from titles and abstracts only. Results were reported in accordance with PRISMA-ScR guidelines.

Results: Of the 3,805 titles and abstracts reviewed, 453 abstracts were included. A total of seven responsibilities were identified: (a) management of therapeutic and adverse effects of medication, (b) management of medication adherence, (c) management of patient medication self-management, (d) management of patient education and information about medication, (e) prescription management, (f) medication safety management and (g) (transition of) care coordination. Within these responsibilities, all tasks performed by nurses were described.

KEYWORDS
drug monitoring, medication adherence, medication therapy management, nurses, nurse's role, patient safety, scoping review, transitional care

1 | INTRODUCTION

Effective team communication and clear definitions of roles are two of the fundamental prerequisites for effective collaboration (Azhar et al., 2012; Van Bogaert et al., 2013; Wilson et al., 2016). Unclear role descriptions hinder the quality of interprofessional communication and collaboration in daily clinical practice, international

collaboration in research, education and innovation, and labour mobility of healthcare professionals (Azhar et al., 2012; Ensing et al., 2015; Maier & Aiken, 2016; Van Bogaert et al., 2013; Wilson et al., 2016). In pharmaceutical care (PC), defined as "the process through which a pharmacist co-operates with a patient and other professionals in designing, implementing and monitoring a therapeutic plan that will produce specific therapeutic outcomes for the patient"

(Council of Europe, 2020; Hepler & Strand, 1990), a clear description of nurses' responsibilities is often lacking (Borrott et al., 2017; Choo et al., 2010; De Baetselier, Van Rompaey, et al., 2020; Ensing et al., 2015; Manias, 2018; Thoma & Waite, 2018). Historically, nurses are responsible for the preparation and administration of medicines under physicians' supervision. However, nurses' responsibilities have expanded over the last decades, with task shifting from physicians to nurses (Maier & Aiken, 2016).

2 | BACKGROUND

In 2017, the World Health Organization has invited its member states to increase medication safety. Their "Global Patient Safety Challenge on Medication Safety" aimed to reduce avoidable patient harm resulting from medication errors by 50% within 5 years. Only high prioritization of medication safety within healthcare systems globally will make this goal achievable. (WHO, 2017) PC can have a considerable impact on medication safety and patient outcomes. Positive effects on the number of medication errors and adverse drug reactions, increased patient treatment perception and a decrease in unplanned hospital admissions have been shown in previous research. (Dilles et al., 2013; Parretta et al., 2014; Lopez-Gonzalez et al., 2015; Jordan et al., 2015; Dürr et al., 2021) Nurses are considered as essential to the promotion of patient safety. They assess risks to safety and take appropriate action to manage those, putting the best interests, needs and preferences of people first. (Choo et al., 2010; Nursing & Midwifery Council, 2018) Nurses often appear to be the last barricade between patients and medication errors, because they are well-positioned to identify drug-related problems and minimize unnecessary drug-related patient harm. (Dykes et al., 2010; Gabe et al., 2011; Henneman et al., 2010; Jordan et al., 2015; Rogers et al., 2008; Soerensen et al., 2018; Ulfvarson et al., 2007) In a previous study, 4,888 European nurses indicated monitoring therapeutic and adverse effects of medicines, monitoring medicines adherence, prescribing medicines and providing patient education and information about medicines are part of their clinical practice activities (De Baetselier, Van Rompaey, et al., 2020). A subsequent large-scale interview study was able to confirm this active role in PC (De Baetselier, Dilles, et al., 2020). Moreover, within nurses' responsibilities, several tasks were described, depending on the context, knowledge and training of the nurse: detecting clinical change and healthcare problems; assessing patients' needs; registration; multidisciplinary communication (including reporting, alerting and discussion); communication with patients; intervention in emergency cases; follow-up; self-care support; "dependent" and "independent" nurse prescribing; and reporting medication errors and safety issues (De Baetselier, Dilles, et al., 2020). Although the list of responsibilities and tasks was not exhaustive, both studies offer opportunities to create a framework for discussion in clinical practice, collaboration in research and labour mobility. Nurses, pharmacists and physicians should openly discuss allocation of specific (shared) responsibilities and tasks.

To develop a consensual framework about nurses' role in PC, previous findings should be compared with existing evidence, and the validity should be investigated. A scoping review of research about nurses' role within PC is needed to corroborate this role or to supplement the existing list with additional responsibilities and tasks. After all, internationally different nurse responsibilities may exist. Consequently, the aim of this study was to provide an overview of existing responsibilities and tasks of nurses in PC in international literature beyond preparation and administration of medication.

3 | METHODS

3.1 | Study design

A scoping review methodology was used (Arksey & O'Malley, 2005; Levac et al., 2010; Peters et al., 2015). The review was drafted using the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR, Tricco et al., 2018). As the aim was to identify responsibilities and tasks described, results of the studies included were not used or reported. Quality appraisal of the studies was irrelevant to the aim and therefore not applied.
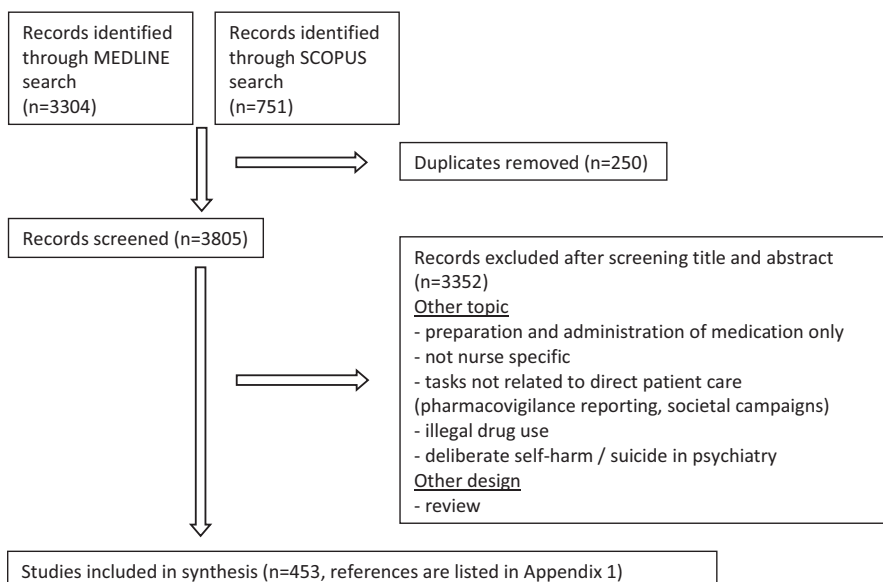
3.2 | Search strategy and eligibility criteria

Two electronic databases were searched with a team of 10 nurse researchers, including all authors: MEDLINE (PubMed) and Scopus. Because of feasibility reasons, we limited the publication date to five years for MEDLINE and from July 2016–2020 for Scopus. The exact search strategy for both databases is shown in Table 1. The initial search strategy was drafted for MEDLINE and adapted for Scopus. All authors agreed on the search strategy. A combination of Medical Subject Headings (MeSH terms) or free text terms related to PC and the search term "nurse" in title or abstract was used. After the last search on 16 July 2020, the final search results were exported to EndNote X9®, and duplicates were removed.

Subsequently, papers were screened for title and abstract. Original research published in the last five years in English, French, Dutch or German was eligible. To be included, abstracts were required to clearly report a nurse responsibility or task related to PC, pharmacotherapy, medicines optimization or medication management in clinical practice. Research papers about illegal drug use, deliberate self-harm, suicide in psychiatry or nurse activities not related to direct patient care were excluded. Studies limited to preparation and administration of medication were not accepted for inclusion. These basic and generally known nursing tasks have been performed by nurses even before Florence Nightingale laid the foundation of professional nursing in the 19th century, and hence were not a topic of discussion (Dossey, 2010). To enable including a large number of studies, only abstracts were considered. The presumption of the researchers was that if an article had a fundamental

Database	Search strategy
MEDLINE	(((("pharmaceutical care") OR ("pharmacotherapy") OR ("drug monitoring") OR ("medication review") OR ("medication reconciliation") OR ("medicines optimization") OR ("medication therapy management") OR ("Drug Utilization Review"[Mesh]) OR ("medication monitoring") OR (Medication Errors[Mesh]) OR ("drug-related problem*") OR ("adverse drug reaction*") OR ("adverse drug event*") OR ("Pharmaceutical Preparations/adverse effects"[Mesh])) OR (((education) OR (prescribing) OR (adherence) OR (self-management) OR (self-care) OR (safety) OR ("nurses' role") OR ("Quality Assurance, Health Care"[Mesh]) OR ("Program Evaluation"[Mesh]) OR ("Safety Management"[Mesh]) OR ("patient safety")) AND ((medication[Title/Abstract]) OR (drug[Title/Abstract]) OR (medicines[Title/Abstract]))) AND ((nurse*[Title/Abstract]) OR (nursing[MeSH])))) **NOT** (((("pharmaceutical care") OR ("pharmacotherapy") OR ("drug monitoring") OR ("medication review") OR ("medication reconciliation") OR ("medicines optimization") OR ("medication therapy management") OR ("Drug Utilization Review"[Mesh]) OR ("medication monitoring") OR (Medication Errors[Mesh]) OR ("drug-related problem*") OR ("adverse drug reaction*") OR ("adverse drug event*") OR ("Pharmaceutical Preparations/adverse effects"[Mesh])) OR (((education) OR (prescribing) OR (adherence) OR (self-management) OR (self-care) OR (safety) OR ("nurses' role") OR ("Quality Assurance, Health Care"[Mesh]) OR ("Program Evaluation"[Mesh]) OR ("Safety Management"[Mesh]) OR ("patient safety")) AND ((medication[Title/Abstract]) OR (drug[Title/Abstract]) OR (medicines[Title/Abstract]))) AND ((nurse*[Title/Abstract]) OR (nursing[MeSH]))) AND Review[ptyp] AND "last 5 years"[PDat])
Scopus	((("pharmaceutical care") OR (pharmacotherapy) OR ("drug monitoring") OR ("medication review") OR ("medication reconciliation") OR ("medicines optimization") OR ("medication therapy management") OR ("medication monitoring") OR ("drug-related problem*") OR ("adverse drug reaction*") OR ("adverse drug event*")) OR (((education) OR (prescribing) OR (adherence) OR (self-management) OR (self-care) OR (safety) OR ("nurses' role") OR ("patient safety")) AND ((TITLE(medication)) OR (TITLE(drug)) OR (TITLE(medicines))))) AND ((TITLE(nurse*))) AND (EXCLUDE (DOCTYPE,"re")) AND (LIMIT-TO (PUBYEAR,2020) OR LIMIT-TO (PUBYEAR,2019) OR LIMIT-TO (PUBYEAR,2018) OR LIMIT-TO (PUBYEAR,2017) OR LIMIT-TO (PUBYEAR,2016))

FIGURE 1 Selection of sources of evidence

opinion about nurse responsibilities or tasks, this should at least have been stated in the abstract. Hence, all necessary data could be extracted from title or abstract. The same approach has been used in a recent scoping review of Rinchuse and Greene (2018). Figure 1 shows the selection process and results in a flow diagram according to the PRISMA reporting guidelines (Tricco et al., 2018).

3.3 | Data extraction and synthesis

Data of included studies were extracted by all team members independently using a structured data extraction matrix and checked by the first author as part of quality assurance. Any disagreements were resolved by consensus or by discussion within the team. General characteristics were recorded: design, country, setting, patient population, level of nurse education, outcomes, whether or not published in a nursing journal and by nurse researchers. For each paper, nurse responsibilities in PC as well as nurses' tasks within these responsibilities were extracted. Responsibilities and tasks were defined based on literature, together with discussions with an expert in health law, liability law and ethics and a legal philosopher which was also an ethicist: "*The role of nurses involves several responsibilities. A responsibility for nurses is an obligation that they have in virtue of their role as a nurse. Their central responsibility is to be the patient's health advocate and to provide high quality of care, using sound professional judgement and taking into account the relevant legal and moral considerations. The other responsibilities of nurses derive from this central responsibility. Nurses can be made to answer for failing in their responsibilities, which could result in disciplinary, civil, and criminal liability. Specific tasks may have to be performed in order to fulfill a responsibility.*" (Krautscheid, 2014; Nursing & Midwifery Board of Ireland, 2015).

Responsibilities and tasks were extracted from title or abstract, whereas for the extraction of general article characteristics also, full texts were considered. Primary study results were not extracted from the papers because of the lack of added value in providing an overview of nurse responsibilities and tasks in PC. For the same reason, a critical appraisal of the study quality was not carried out either.

3.4 | Data analysis

All PC-related nursing roles beyond administration and preparation of medication, described in recent literature, were taken into account, regardless of the frequency of their reporting. Equal or similar nurse activities were described in different ways across studies. To provide a manageable overview, comparable and similar activities were clustered, and the most inclusive terminology was chosen. In Appendix S2, examples of similar tasks have been presented in order to enhance reliability and verifiability of the data analysis.

3.5 | Ethics

Ethical approval nor patient consent was required for this scoping review.

4 | RESULTS

4.1 | Study selection

After duplicates were removed, a total of 3,805 citations were identified from the electronic database searches. Based on title and abstract, 3,352 were excluded. The remaining 453 studies were considered eligible for this review and hence were included. References are listed in Appendix S1.

4.2 | Study characteristics

A summary of relevant study characteristics is presented in Table 2. Besides, individual study characteristics can be found in Appendix S1. Studies from all continents and with a large variety of qualitative and quantitative study designs were reviewed. Patient populations and healthcare settings varied widely, and different nurse categories were described, although most articles did not specify nurses' specialization or level of education. In 19% of the studies, nurse researchers were involved in the research team and 38% of the studies were published in nursing journals.

4.3 | Nurses' responsibilities and tasks in pharmaceutical care

More than 100 aspects of PC by nurses (Appendix S2) were extracted from the included abstracts, compiled into 28 tasks and subsequently clustered into seven main nurse responsibilities. Some tasks were part of one specific responsibility, yet most tasks could be categorized as part of several responsibilities. Below we described responsibility-specific tasks for each of the seven nurse responsibilities. Table 3 provides a complete overview of the responsibilities and tasks extracted from recent literature.

4.3.1 | Management of therapeutic and adverse effects of medication

Structured medication monitoring was carried out by nurses in charge of supervising patients. This consisted of medication anamnesis, observing, monitoring and assessing therapeutic and side effects of medication, for example by monitoring vital signs. Nurses collected information and evaluated patients' clinical status and needs, which was documented and registered in patients' files, as well as communicated to the team (physician and pharmacist), the patient or his informal caregiver and family. Early identification of drug-related problems (DRPs) and intensive monitoring of adverse drug reactions (ADRs) by nurses were reported. In order to prevent DRPs, assessments and follow-up of medication regimens were done. Nurse-led phone calls and nurse consultations were a frequently used way of follow-up.

4.3.2 | Management of medication adherence

Nurses assessed medication adherence and its hindering factors. Through in-depth assessing, followed by planning of medication regimens, patients could be encouraged to take their medicines correctly. Support and promotion to adhere to medication schedules

TABLE 2 Characteristics of included papers (N = 453)

Study characteristics	Number of studies, % (N)
Continent	
Africa	4.2 (19)
Asia	14.6 (66)
Australia	9.5 (43)
Europe	33.3 (151)
North America	36.4 (165)
South America	1.6 (7)
More than one continent	0.4 (2)
Study design	
Quantitative	
Observational	46.8 (212)
Interventional	27.2 (123)
Qualitative	17.4 (79)
Multimethod	8.6 (39)
Patient population, specified by	
Disease	
Physical disease or characteristic	34.0 (154)
Mental disease or characteristic	4.4 (20)
Social characteristic (e.g. income, insurance)	2.2 (10)
Therapy	
Medication related (e.g. opioids, antibiotics)	13.0 (59)
Non-medication related (e.g. surgery, end-of-life care)	3.6 (16)
Other	
Age (e.g. elderly, children)	8.4 (38)
Residence (e.g. hospital, home)	9.9 (45)
No patients involved or not specified	24.5 (111)
Healthcare setting	
Hospital	51.6 (234)
Primary/community health care	24.9 (113)
Residential health care	5.5 (25)
Mental health care	1.8 (8)
Outpatient setting	7.1 (32)
More than one care setting (e.g. transitional care)	0.7 (3)
Educational setting	1.3 (6)
Not specified or unclear	7.1 (32)
Nurse category, if specified[a]	
(Advanced) nurse practitioner	32.2 (64)
Registered Nurse	25.1 (50)
Specialized nurse (e.g. oncology, ER, nurse-midwifes)	24.6 (49)
Independent nurse prescriber	7.5 (15)
(Clinical) nurse specialist	7.0 (14)
Advanced practice nurse	5.5 (11)

TABLE 2 (Continued)

Study characteristics	Number of studies, % (N)
Other (nurse case manager, physician assistant, licenced practical nurse, graduate nurse, diploma nurse, students)	9.0 (18)
Nurse researchers involved	
Yes	26.3 (119)
No	18.8 (85)
Unknown	54.9 (249)
Published in a nursing journal	
Yes	37.5 (170)
No	62.5 (283)

[a]56% of studies did not specify the nurse category. Percentages are calculated for studies with a specified nurse category (N = 199). Some studies included more than one nurse category which results in a total of more than 100%.

were part of nurses' tasks for which motivational interviewing techniques were used. Several studies described nurse interventions to improve and follow-up adherence, among others: providing dispensing services, adherence counselling, telemonitoring, web-based interventions and nurse-led telephone calls. Furthermore, nurses had an important warning function: when observing non-adherence, they contacted other healthcare disciplines to report their findings and to collaborate to prevent non-adherence-related ADRs.

4.3.3 | Management of patient medication self-management

Several tasks for nurses in medication self-management have been described. Nurses assessed patients' self-administration competences, assisted self-administration and empowered patients to self-manage their medicines. Regular visits by nurses as well as web-based/e-health interventions contributed to support self-care and medication self-management. Both patients and informal caregivers were coached and trained by nurses. Collaboration with other professionals was indispensable.

4.3.4 | Management of patient education and information

Nurses were described as healthcare professionals responsible for facilitating and filtering information for patients, family and informal caregivers. After assessing patients' needs, a diverse range of evidence-based information, education, counselling and training strategies led to a better understanding of medication regimens and possible effects and improved medication adherence. Antimicrobial stewardship, in terms of educating patients to stem antibiotic

TABLE 3 Overview of nurses' responsibilities and tasks in pharmaceutical care

Tasks of nurses within pharmaceutical care	7 responsibilities[a] of nurses within pharmaceutical care						
	1	2	3	4	5	6	7
Observation, monitoring medication effects							
Medication anamnesis							
Assessing patients' competences							
Assessing and addressing patients'/family's needs							
Recognizing and preventing risks/complications/DRPs				■			
Identifying, assessing, reporting and addressing contra-indications/DRPs				■			
Documentation, registration in patient files							
Communication with patient/family, including discussion and advice							
Inter/intraprofessional communication, including reporting, advising, informing, alerting and discussing							
Evidence-based practice							
Decision-making							
Inter/intraprofessional referrals							
(Selfcare) support, empowerment							
Therapeutic education (counselling, coaching, training patient/family)					■		
Antimicrobial stewardship	■			■	■	■	■
Motivational interviewing	■			■	■	■	■
Initiation of medication (reactive/proactive)	■			■		■	■
Determination and adaptation of type/dosage of medication	■			■		■	■
Decision on continuation/cessation of medication	■			■		■	■
PRN (pro re nata, "if needed" medication)/standing prescription order	■			■		■	■
Medication reconciliation (anamnesis, medication histories, …)	■			■		■	
Medication review	■			■		■	
Intervention in case of emergency	■			■			■
Follow-up of patients and medication regimens							
Discharge planning, transition of care planning	■	■	■	■	■	■	
Collegial mentoring							

☐ A light grey cell means the task (row) was reported to be performed in order to fulfil the responsibility (column).

■ A dark grey cell means the task (row) was not reported as a part of the responsibility (column).

[a] The 7 responsibilities are: (1) Management of therapeutic and adverse effects of medication; (2) Management of medication adherence; (3) Management of patient medication self-management; (4) Management of patient education and information; (5) Prescription management; (6) Medication safety management; (7) Care/transition of care coordination.

overuse, and nurse educational programmes about proper and safe medication disposal were also mentioned. From observation over recording to follow-up, nurses communicated and collaborated intensively with physicians and pharmacists.

4.3.5 | Prescription management

Independently prescribing of medicines was done by certain nurses in some countries, though this was not a generally reported task

of nurses. Besides the autonomous initiation of medicines during a nurse consultation, a range of tasks with a large variation in autonomy was described. Nurses monitored indications to prescribe, evaluated contra-indications and assessed patient's and family's preferences. They created accurate, up-to-date medication lists in preparation of medication reconciliation, highlighted discrepancies in medicines and initiated multidisciplinary medication reviews to be carried out together with physicians and pharmacists. Medical prescriptions were continued, optimized (e.g. by adjusting routes, dosage or type of drug) or discontinued. Management of standing renewal prescription orders and PRN (*pro re nata*, "if needed") medication were also described as nursing tasks within prescription management. Throughout the total prescription process, nurses communicated with patients, physicians, pharmacists and other nurses. If necessary, patients were referred to medical prescribers. Lastly, antimicrobial stewardship, in terms of educating and persuading prescribers to stem antibiotic overuse, was reported as a possible nursing task.

4.3.6 | Medication safety management

Different studies mentioned a key role for nurses in detecting potentially harmful medications or combinations of medications. Further tasks in optimizing and improving patient safety were assessment of DRPs and drug risks-benefits, (early) identification and report of ADRs and monitoring high risk medicines. Nurses – often referred to as patients' advocates – were also responsible for preventing ADRs, promoting safe medication use and safekeeping.

4.3.7 | (Transition of) care coordination

Within one healthcare setting or between two or more settings, nurses took up the coordination of care. To ensure the continuity of PC, nurses had to exchange medication-related information. Interprofessional communication about observations, discharge planning and follow-up were part of nurses' job content. Nurses assessed patients' needs, educated patients and their informal caregivers before discharge and performed follow-up of patients after discharge. During the transition of care, nurses had a role in identifying medication discrepancies and preparing discharge summaries.

5 | DISCUSSION

In this scoping review, we identified 453 studies published between 2016–2020 addressing nurses' responsibilities and tasks in PC across various healthcare settings. Our findings gave us the opportunity to map existing responsibilities and tasks of nurses in PC. A total of seven responsibilities were synthesized: (a) management of therapeutic and adverse effects of medication, (b) management of medication adherence, (c) management of patient medication self-management, (d) management of patient education and information about medication,

(e) prescription management, (f) medication safety management and (g) (transition of) care coordination. Also, specific tasks to be performed in order to fulfil these responsibilities were reported. Nurses' responsibilities in PC, however, are no strictly defined self-contained entities with unique tasks, yet, more an entangled, interwoven continuum of tasks with many of these tasks being part of more than one responsibility. In this way, the responsibility of care coordination is apparently covered by the other six responsibilities. However, discharge planning, an essential task within care coordination, cannot be attributed to the other responsibilities, which demonstrates the need to specify care coordination as a separate responsibility.

Also, the responsibility of medication safety management is a bit an odd one out, since ensuring safety has to be done within each of the other responsibilities. Therefore, the question can be raised whether safety management has to be seen as a separate responsibility or a part of all the other ones. To emphasize the importance of safe PC, we have chosen for a separate mentioning.

Obviously, not every nurse would be capable of performing every task in every situation. Many contextual factors should be taken into account. A recent study in 340 nurses, physicians and pharmacists listed some of the prerequisites to allow nurses' to take up responsibilities in PC: educational level, laws and legislation, an interprofessional collaborative approach, confidence in nurses, an open blame-free culture with clarity of team composition and roles, equality between professionals, readiness of professionals and patients to allow nurses having responsibilities in PC, and a manageable workload leaving "time to care" (De Baetselier, Dilles, et al., 2020). The aim of our study was not to provide a ready-made description of the responsibilities of any nurse, anywhere in the world, yet to present a broad overview of possible responsibilities and tasks. As a result, this review gives important insights into the extensiveness of nurses' activities. These activities extended far beyond the generally known preparation and administration of medication, suggesting nurses playing an important part in PC with a major impact on care quality.

When comparing basic characteristics as geographical spread and study design between the studies, included in this review, and other nursing research with and without specific focus on nurses' responsibilities in PC, no significant differences are found. To illustrate, numbers from the Scimago institution rankings show similarity for overall publications in nursing areas between 2016–2019 with most publications in North America (32%) and Europe (29%), followed by Asia (18%), South America (10%), Australia (8%) and Africa (2%) (Scimago Institution Ranking, 2020). A recent systematic review on European nursing research publications corroborates that observational studies are most represented (42%) in nursing literature (Richards et al., 2018).

5.1 | Implications for nursing research, clinical practice and education

This knowledge about the extent of nurses' capabilities in different countries and healthcare settings, with distinct contexts and

educational levels will contribute to cross-country comparability and labour mobility of nurses. This was also suggested in previous international research (Maier, 2019; Maier & Aiken, 2016; Maier et al., 2018). Furthermore, successful examples of high-educated nurses with advanced nursing roles can inspire countries with lower educated nurses or less extensive nursing roles. This in turn can lead to an extension of task shifting and changes of professional boundaries between nurses and medical staff all over the world. Moreover, countries with already existing role extensions, yet without legal framework, can be persuaded to adapt current laws and regulations to existing clinical practice.

Our results offer opportunities to create a framework for nurses' role in PC, to be used for discussion in clinical practice, collaboration in research and labour mobility. Increasing the awareness of team members' (potential) roles can allow pharmacists, nurses and physicians to benefit from teamwork. (Makowsky et al., 2009) Additionally, such a framework could be used to develop an assessment to evaluate nurse competences in PC, as a guidance to evaluate nurse education and a tool for nurse educators. In this study, we did not distinguish between levels of nurse education. Differences should be addressed in further research.

5.2 | Strengths and limitations

Our review has some limitations. To enable including a large number of studies, only abstracts were considered. Therefore, some of the excluded studies might also have mentioned certain responsibilities or tasks in their full text, yet without focusing on them. Also, to make our review more feasible, we only used two databases and exclusively included primary research (no reviews) with a clear mentioning of nurses' responsibilities or tasks in title or abstract.

An important strength of our review is the reporting quality. Through our approach, methodological rigour and transparency could be achieved (Arksey & O'Malley, 2005; Colquhoun et al., 2014; Daudt et al., 2013; Tricco et al., 2018). Our systematic approach and reproducible method add to the important value of this study in PC.

6 | CONCLUSION

We examined recent international literature related to PC by nurses and gave an overview of the variety within nurses' responsibilities and tasks in PC. Main areas of responsibility were management of therapeutic and adverse effects of medication, medication adherence, patient medication self-management, patient education and information about medication, prescribing, medication safety and (transition of) care coordination. The extensiveness of nurses' activities showed nurses are key persons in PC for patients, suggesting them having a major impact on care quality. This scoping review will promote the development of a framework for nurses' role in interprofessional PC, to be used for discussion in clinical practice, collaboration in research and labour mobility of nurses. Future research

should investigate differences in nurses' responsibilities and tasks between different levels of nurse education.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

AUTHOR CONTRIBUTIONS

E.D.B., T.D., H.F., F.H., L.M., and B.V.R.: Conceptualization, methodology, and investigation. T.D., H.F., F.H., L.M., and B.V.R.: Validation and writing – review and editing. E.D.B., T.D. and B.V.R.: Data curation and funding acquisition. E.D.B.: Writing – original draft preparation and formal analysis. T.D. and B.V.R.: Supervision. All authors have read and agreed to the published version of the manuscript.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in the supplementary material of this article.

ORCID

Elyne De Baetselier https://orcid.org/0000-0002-1586-7825
Tinne Dilles https://orcid.org/0000-0003-2817-0944
Filip Haegdorens https://orcid.org/0000-0003-1996-8786
Laura Mortelmans https://orcid.org/0000-0003-1720-5478
Bart Van Rompaey https://orcid.org/0000-0001-7670-0300

REFERENCES

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19–32. https://doi.org/10.1080/1364557032000119616

Azhar, S., Hassali, M. A., Mohamed Ibrahim, M. I., Saleem, F., & Siow Yen, L. (2012). A survey evaluating nurses' perception and expectations towards the role of pharmacist in Pakistan's healthcare system. *Journal of Advanced Nursing*, *68*(1), 199–205. https://doi.org/10.1111/j.1365-2648.2011.05728.x

Borrott, N., Kinney, S., Newall, F., Williams, A., Cranswick, N., Wong, I., & Manias, E. (2017). Medication communication between nurses and doctors for paediatric acute care: An ethnographic study. *Journal of Clinical Nursing*, *26*(13–14), 1978–1992. https://doi.org/10.1111/jocn.13606

Choo, J., Hutchinson, A., & Bucknall, T. (2010). Nurses' role in medication safety. *Journal of Nursing Management*, *18*(7), 853–861. https://doi.org/10.1111/j.1365-2834.2010.01164.x

Colquhoun, H. L., Levac, D., O'Brien, K. K., Straus, S., Tricco, A. C., Perrier, L., Kastner, M., & Moher, D. (2014). Scoping reviews: Time for clarity in definition, methods, and reporting. *Journal of Clinical Epidemiology*, *67*(12), 1291–1294. https://doi.org/10.1016/j.jclinepi.2014.03.013

Council of Europe (2020). *Resolution CM/res(2020) 3 on the implementation of pharmaceutical care for the benefit of patients and health*

services. Retrieved from https://search.coe.int/cm/pages/result_details.aspx?objectid=09000016809cdf26

Daudt, H. M. L., van Mossel, C., & Scott, S. J. (2013). Enhancing the scoping study methodology: A large, inter-professional team's experience with Arksey and O'Malley's framework. *BMC Medical Research Methodology*, *13*(1), 48. https://doi.org/10.1186/1471-2288-13-48

De Baetselier, E., Dilles, T., Batalha, L. M., Dijkstra, N. E., Fernandes, M. I., Filov, I., Friedrichs, J., Grondahl, V. A., Heczkova, J., Helgesen, A. K., Jordan, S., & Van Rompaey, B. (2020). *Perspectives of nurses' role in interprofessional pharmaceutical care across 14 European countries: A qualitative study in pharmacists, physicians and nurses.* Manuscript submitted for publication.

De Baetselier, E., Van Rompaey, B., Batalha, L. M., Bergqvist, M., Czarkowska-Paczek, B., De Santis, A., Dijkstra, N. E., Fernandes, M. I., Filov, I., Grøndahl, V. A., Heczkova, J., Helgesen, A. K., Isfort, M., Jordan, S., Karnjus, I., Keeley, S., Kolovos, P., Langer, G., Lillo-Crespo, M., ... Dilles, T. (2020). EUPRON: Nurses' practice in interprofessional pharmaceutical care in Europe. A cross-sectional survey in 17 countries. *British Medical Journal Open*, *10*(6), e036269. https://doi.org/10.1136/bmjopen-2019-036269

Dilles, T., Vander Stichele, R. H., Van Bortel, L. M., & Elseviers, M. M. (2013). The development and test of an intervention to improve ADR screening in nursing homes. *Journal of the American Medical Directors Association*, *14*(5), 379.e1–6. https://doi.org/10.1016/j.jamda.2013.02.011

Dossey, B. M. (2010). Florence nightingale: A 19th-century mystic. *Journal of Holistic Nursing*, *28*(1), 10–35. https://doi.org/10.1177/0898010109356474

Dürr, P., Schlichtig, K., Kelz, C., Deutsch, B., Maas, R., Eckart, M. J., Wilke, J., Wagner, H., Wolff, K., Preuß, C., Brückl, V., Meidenbauer, N., Staerk, C., Mayr, A., Fietkau, R., Goebell, P. J., Kunath, F., Beckmann, M. W., Mackensen, A., ... Fromm, M. F. (2021). The randomized AMBORA trial: Impact of pharmacological/pharmaceutical care on medication safety and patient-reported outcomes during treatment with new oral anticancer agents. *Journal of Clinical Oncology*, *39*(18), 1983–1994. https://doi.org/10.1200/jco.20.03088

Dykes, P. C., Rothschild, J. M., & Hurley, A. C. (2010). Medical errors recovered by critical care nurses. *Journal of Nursing Administration*, *40*(5), 241–246. https://doi.org/10.1097/NNA.0b013e3181da408e

Ensing, H. T., Stuijt, C. C., van den Bemt, B. J., van Dooren, A. A., Karapinar-Çarkit, F., Koster, E. S., & Bouvy, M. L. (2015). Identifying the optimal role for pharmacists in care transitions: A systematic review. *Journal of Managed Care & Specialty Pharmacy*, *21*(8), 614–636. https://doi.org/10.18553/jmcp.2015.21.8.614

Gabe, M. E., Davies, G. A., Murphy, F., Davies, M., Johnstone, L., & Jordan, S. (2011). Adverse drug reactions: Treatment burdens and nurse-led medication monitoring. *Journal of Nursing Management*, *19*(3), 377–392. https://doi.org/10.1111/j.1365-2834.2011.01204.x

Henneman, E. A., Gawlinski, A., Blank, F. S., Henneman, P. L., Jordan, D., & McKenzie, J. B. (2010). Strategies used by critical care nurses to identify, interrupt, and correct medical errors. *American Journal of Critical Care*, *19*(6), 500–509. https://doi.org/10.4037/ajcc2010167

Hepler, C. D., & Strand, L. M. (1990). Opportunities and responsibilities in pharmaceutical care. *American Journal of Health-System Pharmacy*, *47*(3), 533–543. https://doi.org/10.1093/ajhp/47.3.533

Jordan, S., Gabe-Walters, M. E., Watkins, A., Humphreys, I., Newson, L., Snelgrove, S., & Dennis, M. S. (2015). Nurse-led medicines' monitoring for patients with dementia in care homes: A pragmatic cohort stepped wedge cluster randomised trial. *PLoS One*, *10*(10), e0140203. https://doi.org/10.1371/journal.pone.0140203

Krautscheid, L. C. (2014). Defining professional nursing accountability: A literature review. *Journal of Professional Nursing*, *30*(1), 43–47. https://doi.org/10.1016/j.profnurs.2013.06.008

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science*, *5*(1), 69. https://doi.org/10.1186/1748-5908-5-69

Lopez-Gonzalez, E., Herdeiro, M. T., Piñeiro-Lamas, M., Figueiras, A., & GREPHEPI group, (2015). Effect of an educational intervention to improve adverse drug reaction reporting in physicians: A cluster randomized controlled trial. *Drug Safety*, *38*(2), 189–196. https://doi.org/10.1007/s40264-014-0256-6

Maier, C. B. (2019). Nurse prescribing of medicines in 13 European countries. *Human Resources for Health*, *17*(1). https://doi.org/10.1186/s12960-019-0429-6

Maier, C. B., & Aiken, L. H. (2016). Task shifting from physicians to nurses in primary care in 39 countries: A cross-country comparative study. *The European Journal of Public Health*, *26*(6), 927–934. https://doi.org/10.1093/eurpub/ckw098

Maier, C. B., Budde, H., & Buchan, J. (2018). Nurses in expanded roles to strengthen community-based health promotion and chronic care: Policy implications from an international perspective; A commentary. *Israel Journal of Health Policy Research*, *7*(1), 64. https://doi.org/10.1186/s13584-018-0257-5

Makowsky, M., Schindel, T., Rosenthal, M., Campbell, K., Tsuyuki, R., & Madill, H. (2009). Collaboration between pharmacists, physicians and nurse practitioners: A qualitative investigation of working relationships in the inpatient medical setting. *Journal of Interprofessional Care*, *23*(2), 169–184. https://doi.org/10.1080/13561820802602552

Manias, E. (2018). Effects of interdisciplinary collaboration in hospitals on medication errors: An integrative review. *Expert Opinion on Drug Safety*, *17*(3), 259–275. https://doi.org/10.1080/14740338.2018.1424830

Nursing and Midwifery Board of Ireland (2015). *Scope of Nursing and Midwifery Practice Framework*. Retrieved from https://www.nmbi.ie/nmbi/media/NMBI/Publications/Scope-of-Nursing-Midwifery-Practice-Framework.pdf?ext=.pdf

Nursing and Midwifery Council (2018). *Standards of proficiency for registered nurses*. Retrieved from https://www.nmc.org.uk/globalassets/sitedocuments/education-standards/future-nurse-proficiencies.pdf

Parretta, E., Rafaniello, C., Magro, L., Pittoni, A. C., Sportiello, L., Ferrajolo, C., Mascolo, A., Sessa, M., Rossi, F. & Capuano, A. (2014). Improvement of patient adverse drug reaction reporting through a community pharmacist-based intervention in the Campania region of Italy. *Expert Opinion on Drug Safety*, *13*, S21–S29. https://doi.org/10.1517/14740338.2014.939582

Peters, M. D. J., Godfrey, C. M., Khalil, H., McInerney, P., Parker, D., & Soares, C. B. (2015). Guidance for conducting systematic scoping reviews. *International Journal of Evidence-Based Healthcare*, *13*(3), 141–146. https://doi.org/10.1097/xeb.0000000000000050

Richards, D. A., Hanssen, T. A., & Borglin, G. (2018). The second triennial systematic literature review of European nursing research: Impact on patient outcomes and implications for evidence-based practice. *Worldviews on Evidence-Based Nursing*, *15*(5), 333–343. https://doi.org/10.1111/wvn.12320

Rinchuse, D. J., & Greene, C. S. (2018). Scoping review of systematic review abstracts about temporomandibular disorders: Comparison of search years 2004 and 2017. *American Journal of Orthodontics and Dentofacial Orthopedics*, *154*(1), 35–46.e9. https://doi.org/10.1016/j.ajodo.2017.12.011

Rogers, A. E., Dean, G. E., Hwang, W. T., & Scott, L. D. (2008). Role of registered nurses in error prevention, discovery and correction. *Quality and Safety in Health Care*, *17*(2), 117–121. https://doi.org/10.1136/qshc.2007.022699

Scimago Institution Ranking (2020). *Scimago Journal & Country Rank*. Retrieved from https://www.scimagojr.com/countryrank.php

Soerensen, A. L., Lisby, M., Nielsen, L. P., Poulsen, B. K., & Mainz, J. (2018). Improving medication safety in psychiatry - A controlled intervention study of nurse involvement in avoidance of potentially inappropriate

prescriptions. *Basic & Clinical Pharmacology & Toxicology*, 123(2), 174–181. https://doi.org/10.1111/bcpt.12989

Thoma, J. E., & Waite, M. A. (2018). Experiences of nurse case managers within a central discharge planning role of collaboration between physicians, patients and other healthcare professionals: A sociocultural qualitative study. *Journal of Clinical Nursing*, 27(5–6), 1198–1208. https://doi.org/10.1111/jocn.14166

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D. J., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garritty, C., ... Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine*, 169(7), 467–473. https://doi.org/10.7326/M18-0850

Ulfvarson, J., Mejyr, S., & Bergman, U. (2007). Nurses are increasingly involved in pharmacovigilance in Sweden. *Pharmacoepidemiology and Drug Safety*, 16(5), 532–537. https://doi.org/10.1002/pds.1336

Van Bogaert, P., Kowalski, C., Weeks, S. M., Van Heusden, D., & Clarke, S. P. (2013). The relationship between nurse practice environment, nurse work characteristics, burnout and job outcome and quality of nursing care: A cross-sectional survey. *International Journal of Nursing Studies*, 50(12), 1667–1677. https://doi.org/10.1016/j.ijnurstu.2013.05.010

Wilson, A. J., Palmer, L., Levett-Jones, T., Gilligan, C., & Outram, S. (2016). Interprofessional collaborative practice for medication safety: Nursing, pharmacy, and medical graduates' experiences and perspectives. *Journal of Interprofessional Care*, 30(5), 649–654. https://doi.org/10.1080/13561820.2016.1191450

World Health Organisation (2017). *WHO Global Patient Safety Challenge: Medication Without Harm*. World Health Organisation. Retrieved from https://www.who.int/initiatives/medication-without-harm

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

How to cite this article: De Baetselier, E., Dilles, T., Feyen, H., Haegdorens, F., Mortelmans, L., & Van Rompaey, B. (2022). Nurses' responsibilities and tasks in pharmaceutical care: A scoping review. *Nursing Open*, 9, 2562–2571. https://doi.org/10.1002/nop2.984