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**ADMINISTRATIVE INFORMATION****Support** - No Funding.**Review Stage at time of this submission** - Formal screening of search results against eligibility criteria.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202510065**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 January 2025 and was last updated on 18 January 2025.**INTRODUCTION**

**Review question / Objective** "Which cost factors related to advanced practice nursing in ambulatory care settings can be identified and utilized for economic evaluations?" Population – Advanced practice nursing (APN), CNS, NP. Concept – Cost factors for economic evaluations. Context – Ambulatory care Setting.

**Background** Nursing is facing considerable challenges worldwide due to several factors. These include demographic changes, a shortage of nursing staff, and increasing financial pressure in the healthcare system (Organisation for Economic Co-operation and Development [OECD], 2023; International Council of Nursing [ICN], 2023). Innovative solutions are needed to counteract these developments (Deutscher Berufsverband für Pflegeberufe [DBfK], 2019). In 2010, the International Council of Nursing (ICN) already pointed out the insufficient availability of nurses

and the economic pressure. One potential strategy to address this shortage are specialised nurses with in-depth and extended expertise, which is called Advanced Nursing Practice. The ICN (2020) describes Advanced Nursing Practice as a field of activity within nursing. It expands the boundaries of nursing practice and contributes to the further development of the profession. ANP is characterized by the integration and application of a broad spectrum of theoretical and evidence-based knowledge. This is acquired as part of advanced nursing training.

**Rationale** To promote the implementation of Advanced Practice Nurses (APN), a cost-benefit ratio from political and financial perspectives is required. This process necessitates an economic evaluation. For the economic evaluation of specialized nurses specifically, economic factors, including costs and outcomes, must be considered. Identifying relevant cost factors is the

first step toward a well-founded economic analysis.

The aim of this review is to identify cost factors to evaluate Advanced Practices Nurses in an economic way.

## METHODS

### Strategy of data synthesis

#### Search strategy

A three-step search strategy is used. The first two steps were planned for the period from Oktober 2024 to February 2025. The third step will follow after the final evaluation of the results.

In the first step an initial limited search of MEDLINE (PubMed) and Cumulativ Index to Nursing and Allied Health Literature (CINHAL) was started to identify the most important key words and topics. To identify key words, MeSh Terms (PubMed) were used. Then a Pilot Search String for PubMed, Text Words and Mesh Terms were combined to develop a full search string. Before the final search, the authors collaborated with a librarian of a medical university to refine their search strategy. The Search string (PubMed) is attended below.

In the second step, the search string was adapted to other databases. PubMed, CINAHL, Web of Science, and the Cochrane Library were included. Specific filters were applied to refine the search results, and only studies published within the last five years will be included. The choice of languages was limited to German and English, as the authors are fluent in these languages. Work in other languages was excluded to ensure that the analysis is based on a language-validated database.

In the third step, the reference lists of the included studies will be searched for further possible literature. This procedure will again be a two-stage process in which the literature will be identified and will be compared with the inclusion criteria (Page et al., 2021).

#### Types of sources

This scoping review will consider qualitative, quantitative, mixed-methods studies, reviews, and grey literature. A pilot search showed that medical guidelines and clinical studies should be excluded, as they make little or no references to economic aspects.

("advanced practice nurse\*" [Text Word] OR "advanced nurse practitioner\*" [Text Word] OR "ANP" [Text Word] OR "APRN\*" [Text Word] OR "advanced practice registered nurse\*" [Text Word] OR "clinical nurse specialist\*" [Text Word] OR "nurse practitioner\*" [Text Word] OR ("advanced practice nursing" [MeSH Terms] OR "nurse

clinicians" [MeSH Terms] OR "nurse practitioners" [MeSH Terms])) AND ("primary care" [Text Word] OR "primary healthcare" [Text Word] OR "primary\*" [Text Word] OR "ambulator\*" [Text Word] OR "communit\*" [Text Word] OR "home care" [Text Word] OR "community nursing" [Text Word] OR "school nursing" [Text Word] OR ("ambulatory care" [MeSH Terms] OR "ambulatory care facilities" [MeSH Terms] OR "home care services" [MeSH Terms] OR "community medicine" [MeSH Terms] OR "community health services" [MeSH Terms] OR "community health centers" [MeSH Terms] OR "primary health care" [MeSH Terms] OR ("primary nursing" [MeSH Terms] OR "primary care nursing" [MeSH Terms]) OR "nurses, community health" [MeSH Terms] OR "school nursing" [MeSH Terms] OR "school health services" [MeSH Terms])) AND ("cost\*" [Text Word] OR "cost measure\*" [Text Word] OR "measure\*" [Text Word] OR "pricing" [Text Word] OR "medical care cost\*" [Text Word] OR "treatment cost\*" [Text Word] OR "direct cost\*" [Text Word] OR "indirect cost\*" [Text Word] OR "salary" [Text Word] OR "salaries" [Text Word] OR "expenditure\*" [Text Word] OR "expense\*" [Text Word] OR "budget\*" [Text Word] OR ("Health Care Costs" [MeSH Terms] OR "Employer Health Costs" [MeSH Terms] OR "Direct Service Costs" [MeSH Terms] OR "Economics" [MeSH Terms] OR "Health Services Research" [MeSH Terms])).

### Eligibility criteria

#### Participants

Advanced Nurse Practitioners (ANP), Clinical Nurse Specialists (CNS), and Nurse Practitioners (NP) according to the definition provided by the ICN (2020) are included. Other healthcare professionals, such as medical doctors, students, registered nurses without extended competence and members of other professions (e.g. physiotherapy, occupational therapy, speech therapy etc.) are excluded as the study focuses on the specific roles and tasks of ANPs. Studies with adults are included. Newborns, children and adolescents are excluded.

#### Concept

Specific cost factors are used as a concept for the economic evaluation of ANP, CNS, and NP. Possible cost factors include direct and indirect costs. Direct costs refer to expenses such as personnel and training. Indirect costs relate to work absences and productivity losses. An attempt will be made to identify the factors that can be used to calculate the total cost of an advanced practice nurse (APN).

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## Context

The context is limited to ambulatory, school-based, community-based and primary care settings, and health centres, as these are key settings for APNs. Inpatient settings such as hospitals, long-term care facilities, nursing homes, rehabilitation facilities and hospices are excluded, as these settings have different approaches to care and different organisational structures that do not fit in with the focus of the study.

## Source of evidence screening and selection

Following the search, all identified literature will be collated and uploaded into Rayyan and duplicates removed. Following a pilot test, titles and abstracts will then be screened by two independent reviewers for assessment against the inclusion criteria for the review. Any disagreements that arise between the reviewers at each stage of the selection process will be resolved through discussions. The results of the search and the study inclusion process will be reported in full in the final scoping review and presented in a PRISMA flow diagram (Page et al.,2021).

**Data management** Data will be extracted from papers included in the scoping review by two reviewers. For charting relevant factors of economic costs Excel will be used. The data extraction will include specific details about the population, concept, context, study methods and mentioned cost factors.

It is possible that the data extraction will be modified and revised as necessary during the process of extracting data from each included evidence source. Modifications will be detailed in the scoping review. Any disagreements that arise between the reviewers will be resolved through discussion, or with an additional reviewer(s). If appropriate, authors of papers will be contacted to request missing or additional data, where required.

**Presentation of the results** Tables and figures will be created to present the final results. The tables will organize the extracted data into a clear and concise format to understand and compare the findings easily. The results will also be presented in a narrative format to demonstrate more detailed information about the cost factors.

**Language restriction** German, English.

**Country(ies) involved** Austria.

**Keywords** Costs; Economic; Advanced Nursing Practice; ANP; Advanced Practice Nursing; APN; Clinical Nurse Specialist; CNS; Nurse Practitioners; NP; Ambulatory care.

## Contributions of each author

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