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# Evidence characterizing skills, competencies, and policies in advanced nursing practice in intensive care in Europe: a scoping review protocol

**International Nursing Advanced Competency-based Training for Intensive Care (INACTIC).  
Work Package 3**

**Date: January 31, 2019 Gudrun Kaldan, Sara MJ Nordentoft**

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## Aim of the scoping review

What characterizes skills, competencies, and policy in advanced nursing practice in intensive care in Europe?

### Context

INACTIC (International Nursing Advanced Competency-based Training for Intensive Care) is a EU-funded project with the overall aim to develop an international set of competencies, curriculum and education resources for Advanced Level Critical Care Nurses. Furthermore, the aim is to promote harmonization of advanced nursing practice (ANP) roles and facilitate mobility of this advanced level intensive care nursing workforce across Europe. This review will deliver identified competency indicators that characterize advanced nursing practice in intensive care units in Europe. This protocol describes work package 3 (WP3) in the project.

### Background

The management of patients who are critically ill is changing due to increasing population age, increasing prevalence of co-morbid diseases and significant advances (and costs) associated with medical science (1). Increasing patient acuity (2) means access to specialty training and high quality intensive care nursing education is imperative. There is a need to raise the level of practice to more advanced nursing practice (ANP) roles to accommodate future changes. However not all countries have developed programs to do so and there is a lack of consistency of content among the existing health workforce programs (3).

A survey of intensive care units across Europe (n=24 countries) identified considerable variation in eligibility requirements, how students were assessed/examined and duration of education programmes (ranging from 30 days to 24 months), challenges in providing continuing education (n=22 countries), and lack of access to educational resources in 6 countries (4). Moreover, EU Policy for Education and Training emphasizes the need to embed a coherent and comprehensive lifelong learning strategy with transferable and relevant learning outcomes (E&T 2020, Strategic Objective). Variation in baseline creates role confusion between countries, impeding mobility across Europe and career progression for the ICN workforce (3) (ref [http://ec.europa.eu/education/policies/european-policy-cooperation/et2020-framework\\_en](http://ec.europa.eu/education/policies/european-policy-cooperation/et2020-framework_en)).

#### *ANP globally*

The advanced nursing practice role was established in the 1960s e.g. to substitute primary care physicians, since there was a lack of physicians especially in rural populations (1, 5). Advanced practice nurse (APN) is an umbrella term for expanded practice for a variety of roles but is also used as a title for nurses with advanced practice in some countries and therefore several different definitions exist (6). Moreover the nomenclature varies globally adding to the confusion about the roles, misuse of terms, inconsistent titling, and educational preparation (7). The terms advanced nursing practice and advanced practice nursing are often used interchangeably, however advanced nursing practice describes the work, or what nurses do in the role (7). The most commonly identified titles are NP (nurse practitioner), APN (advanced practice nurse), CNS (clinical nurse specialist), and NS (nurse specialist) (8, 9). The NP title is used in Australia, Belgium, Canada, Netherland, New Zealand, Sweden, the United Kingdom (UK), and the USA, whereas the APN title is used in Ireland, Switzerland, Singapore, Spain, and South Korea (1, 6). The NS is used in Austria, France, Greece, and Italy (6). It has been estimated that approximately 70 countries have established

NP/APN roles or are exploring the possibility of introducing these roles (<https://international.aanp.org>). The role of ANP was developed to ensure a high-quality, coordinated care to provide for increasingly complex health care needs and change in staff role and shortages (10). A study of ANP roles identified up to 69 different roles in 35 countries (11).

Consensus is lacking regarding the role or definition of APN and its core competencies worldwide (12). Also, there is broad variation in APN regulation and educational, licensing and credentialing requirements (3). As consequence of the plethora of titles and roles across Europe several definitions exist (9). The International Council of Nurses (ICN) defined APNs as: *“registered nurses who have acquired the expert knowledge base, complex decision-making skills, and clinical competencies for expanded practice”* (ref. International Council of Nurses. Definition and Characteristics of the Role. ICN Nurse Practitioner/Advanced Practice Nursing Network. <http://international.aanp.org/Practice/APNRoles>. Accessed 18 December 2018).

In the UK the NP title is not protected, but recently a new protected role has emerged. Advanced Critical Care Practitioners (ACCPs) are defined as: *“clinical professionals who have developed their skills and theoretical knowledge to a very high standard. They are highly experienced and educated members of the care team who are able to diagnose and treat your health care needs or refer you to an appropriate specialist if needed. They are empowered to make high-level clinical decisions and will often have their own caseload”* (<https://www.ficm.ac.uk/training-examinations/accps>). Another definition from Health Education England (HEE) defines advanced clinical practice: *“Advanced clinical practice is delivered by experienced, registered health and care practitioners. It is a level of practice characterised by a high degree of autonomy and complex decision making. This is underpinned by a master’s level award or equivalent that encompasses the four pillars of clinical practice, leadership and management, education and research, with demonstration of core capabilities and area specific clinical competence. Advanced clinical practice embodies the ability to manage clinical care in partnership with individuals, families and carers. It includes the analysis and synthesis of complex problems across a range of settings, enabling innovative solutions to enhance people’s experience and improve outcomes”* (<https://www.hee.nhs.uk/our-work/advanced-clinical-practice> accessed 19/01/14). Roles and definitions emphasize a variety in case mix, workforce standards, skills, competencies and decision-making skills required for APNs/ANPs. In this review we will use ANP as a general term since it is described in our objective in our EU project document, however when referring to studies, we will use the term mentioned in the respective documents.

#### *ANP outcomes*

The involvement of ANPs in emergency and critical care units have a significant influence on several essential outcomes. ANP have a positive impact on patient’s experiences and the quality of care (13). Moreover, a positive association was demonstrated between the number of registered nurses employed to care for the patients in the acute hospital setting, the quality of their education, and improved patient outcome (14, 15). A systematic review indicates that ANPs provide effective and high-quality patient care and an overall positive impact on patient safety (16). A 2017 cohort study found a reduction in 30-day mortality ( $p= 0.02$ ) and concluded that APNs may play an important role in improving outcome in adult ICUs (17). ANPs improve staff knowledge, skills and competence and enhance quality of work life, distribution of workload and team-work. ANPs contribute to the achievement of organizational priorities and targets and development of policy (13). A recent review (2017) indicates that implementation of

advanced practice nurses in emergency and critical care units improves the length of stay, time to consultation/treatment, mortality, patient satisfaction, and cost (1).

#### *ANP education and policy*

Nursing education is persistently changing in Europe. The Bologna Process (1999) increases the basic educational level of nurses to the baccalaureate level and introduces post graduate degrees (14, 18, 19). Competency categories have been developed to align and enable examination of generic as well as subject-specific competencies, curriculum, core elements of learning, assessment procedures and the development of the European Credit Transfer and Accumulation System, ECTS (20). A systematic review in 2014 analysed nursing education in Europe and found that a full academic pathway through bachelor's, master's and doctor's degrees was offered in 60% of the European countries as members of The European Higher Education Area (EHEA n= 45 member countries) (18). European nursing organisations aim to standardize the curriculum and competency framework to harmonize nursing education across borders although the educational system still lacks coherence (4). An international survey found a lack of standardization in intensive care nursing programs and lack of title protection in approximately half of the surveyed countries (4). There is a need for standardization of nursing education for specialized nurses (3, 21).

The intensive care unit is a physically and emotionally challenging work environment known to increase risk of stress among nurses (22). A standard of lifelong learning for ANPs across countries is important for three key cardinal reasons: i) Standardization improves patient safety (23), with clear links between training and rates of adverse events, such as catheter-related bloodstream infections (24-26). ii) High rates of severe burnout syndrome (with subsequent attrition or long term sickness) have been consistently reported in ICU nurses (22, 27-29) and dissatisfaction with learning opportunities has been linked to high nurse attrition rates (30). Strategies to reduce this include providing on-going training, through a lifelong learning approach. iii) Internationally, educated nurses often experience deskilling and barriers to performing skills to which they are qualified (31). Advanced nurses may be recruited to the lowest positions in the nursing hierarchy, resulting in a global skills waste (32). These forms of workplace social exclusion can have an impact on stress and burnout. Pan-European skills and employability for the future nursing workforce need to be developed to enable mobility and reduce social exclusion.

To accommodate the challenges of ICU, the Competency-Based Training for Intensive Care across Europe (CoBaTrICE) program was developed for physicians. CoBaTrICE is an international partnership of professional organizations and critical care clinicians (33). The ultimate aims of CoBaTrICE are to assure a high-quality level education in intensive care medicine (ICM), to harmonize ICM training without interfering with national regulations and to encourage free movement of ICM professionals across Europe. The CoBaTrICE is used as the main source of the ACCP competencies for nurses (Curriculum for Training for ACCP) and the core competencies are common to all medical training schemes (34). ANP in ICUs is a recognized clinical career pathway (6), but no systematic assessment of APN/NPs exists in the EU (10, 35). The current standard for advanced level nursing is variable across Europe, with inequities in access to education resources and mentorship from colleagues in similar roles (DELSA/ELSA/WD/HEA (2004). However, there is a growing development on APN standards of practice worldwide but no agreement regarding the specific competencies required (12). Several countries have by various means mapped skills or competencies of ANPs and emphasized the importance of the results being applied in education as well

as the need for a joint European curriculum (12).

It is important to have coherent policies to define roles and professional independence in ANP (1). However, not all countries have developed programs to implement ANPs and there is a lack of consistency of content among the existing programs (6, 12). The locus of regulation of ANPs varies by country with difference in level of regulation (10). Maier (2015) describes three governance models: national, decentralized regulation, and no regulation but with local governance mechanisms (10). In addition, there is a difference in prescription authority, endorsement, and scope of practice (10). Heale et al. (2015) conclude in a worldwide survey, that a lack of leadership in government and nursing organizations exist in several countries combined with an absence of strategy (6). In some countries policy makers are aware of advanced practitioners. A qualitative study of policy makers found that specialists and advanced practitioners contributed to a higher quality of care, particularly at the strategic level (36). Task shifting from physicians to nurses requires organizational redesign and reframing of boundaries. Numerous facilitators and barriers to the task shifting process have been documented (4, 37). A Canadian survey identified challenges related to health policy for advanced practice nurses: lack of accreditation of advanced practice programs, poor economy, poor working conditions, and lack of understanding (6). Furlong et al. (2005) recommend a policy to guide development of ANPs (5). Educational curricula need to be flexible and visionary (5). There is a need to develop a policy framework to guide ANP, and an education framework and clarification regarding the accreditation process and practice requirements.

This outlines the importance of the high level of competency and skills required for ANPs working in the intensive care unit. Literature documents considerable variation in framework and education for ANPs across Europe, emphasizing the relevance of reviewing the literature to identify competency indicators. Mapping skills and competencies will allow for harmonization of ANP education and thereby facilitate mobility of the advanced level intensive care nursing workforce across Europe.

## Methods

We will conduct a systematic scoping review to determine the evidence regarding the topic, skills, and competencies in ANP in Europe. The research question is broad in nature as the focus of a scoping review is to summarize breadth of evidence (38). A scoping review “*addresses an exploratory research question aimed at mapping key concepts, types of evidence, and gaps in research related to a defined area or field by systematically searching, selecting, and synthesizing existing knowledge*” (39). We will follow the methodological stages described by Arksey & O’Malley (2005), and further developed by Levac et al. (2010) and Peters et al. (2010) (38, 40, 41). The stages are: 1. identifying the research question, 2. identifying relevant studies, 3. study selection, 4. charting the data, 5. collating, summarizing and reporting the results, and 6. consultation with stakeholders. We will include the first five stages and postpone the sixth stage to collaboration with the overall INACTIC project. Due to the iterative method in scoping reviews, deviations from the protocol may occur and will be noted and justified as amendments in our description of the scoping review procedure.

### Stage 1: Identifying the research question

Due to the broad nature of our research questions, we will use PCC mnemonic (Population, Concept, Context), rather than PICO (Population, Intervention, Comparison, Outcome), which is often used in

systematic reviews, to clarify the focus and construct the research question in our scoping review (42). We will address the following question in this scoping review:

**What characterizes skills, competencies, and policy in advanced nursing practice in intensive care in Europe?**

<b>Definitions in relation to our objective</b>	
<b>Skill</b>	Skill is the knowledge and ability that enables a person to do something well (ref. Collins dictionary, <a href="https://www.collinsdictionary.com/dictionary/english/skill">https://www.collinsdictionary.com/dictionary/english/skill</a> , accessed 190122).
<b>Competence</b>	Competence is the ability to integrate generic professional attributes with specialist knowledge, skills and attitudes and apply them in the workplace (33) (accessed 190121). Competencies are characterized as a task or activity that can be described in terms of knowledge, skills and attitudes, and which can be assessed in the workplace (33) (accessed 190121). Competencies refer to the effective application of a combination of knowledge, skill and judgement demonstrated by an individual in daily practice or job performance. In nursing definitions, there is wide ranging agreement that, in the performance of nursing roles to the standards required in employment, competence reflects the following: i) Knowledge, understanding and judgement; ii) A range of skills cognitive, technical or psychomotor and interpersonal; and iii) A range of personal attributes and attitudes (ref. International Council of Nurses (2005). Regulation Terminology. Geneva, ICN. Available from <a href="http://www.icn.ch/regterms.htm">www.icn.ch/regterms.htm</a> , accessed 190121)
<b>ANP</b>	<i>Advanced nursing practice (ANP)</i> . We will use the definition from ICN. The International Council of Nurses definition of an advanced practice nurse: “ <i>registered nurses who have acquired the expert knowledge base, complex decision-making skills, and clinical competencies for expanded practice</i> ” as mentioned in the background. In our protocol/project we will use ANP as a general term regardless of original term of the individual country. (ref. Available from <a href="http://international.aanp.org/Home/FAQ">http://international.aanp.org/Home/FAQ</a> , accessed 190121)
<b>Intensive care unit</b>	An intensive care unit (ICU) is an organized system for the provision of care to critically ill patients that provides intensive and specialized medical and nursing care, an enhanced capacity for monitoring, and multiple modalities of physiologic organ support to sustain life during a period of acute organ system insufficiency. Although an ICU is based in a defined geographic area of a hospital, its activities often extend beyond the walls of the physical space to include the emergency department, hospital ward, and follow-up clinic (Marshall JC et al; What is an intensive care unit? (ref. A report of the task force of the World Federation of Societies of Intensive and Critical Care Medicine, <i>Journal of Critical Care</i> 37 (2017) 270–276)
<b>Europe</b>	Europe consists of 50 countries: 28 EU-members and 22 non-EU-member countries. (ref. <a href="https://europa.eu/european-union/about-eu/countries_da#andre-europæiske-lande">https://europa.eu/european-union/about-eu/countries_da#andre-europæiske-lande</a> ). We will include the 50 countries.
<b>Policy</b>	A policy is a set of ideas or plans that is used as a basis for making decisions, especially in politics, economy, or business. An official organization's policy on a particular issue or towards a country is the attitude and actions regarding that issue or country (ref. Collins dictionary, <a href="https://www.collinsdictionary.com/dictionary/english/policy">https://www.collinsdictionary.com/dictionary/english/policy</a> , accessed 190122)

## Stage 2: Identifying the relevant studies

We conducted a preliminary search to identify key-words and terms for ANPs in Europe. The search terms were guided by our research question and key terms delivered to the Danish team from the Delphi study in INACTIC WP2. In cooperation with the Information Specialist, we selected relevant databases. The search strategy will be comprehensive. We will identify relevant studies by conducting literature search in collaboration with an Information Specialist at the Copenhagen University Hospital Rigshospitalet. Due to resource restrictions and time limits, we will have to restrict the search for legal or political manifest describing curriculum for ANPs in original languages other than the mentioned ones in the protocol. Guided by The JBI Institute we used the PCC mnemonic (P for Population, C for concept, and C for Context to construct a clear and meaningful inclusion criteria's (42).

The following PCC terms describe and guide our search for relevant studies:

*Population:* Studies referring to advanced nurse practitioners or equivalent/corresponding to the individual country of reference. Titles may be different across Europe and we will include studies concerning: advanced critical care practitioner/ANP, APN, NS, nurses specialized or expert in critical care or intensive care and educated at a graduate or post-graduate level.

*Concept:* The main concept will focus on studies/texts/syllabus/legislations/framework examining, explaining, and describing education, caseload, qualifications, knowledge, curriculum, competencies and skills competencies required for ICU nurses working with advanced care. Furthermore, texts describing national as well as international policies describing advanced nursing practice curriculum.

*Context:* The context encompasses any details in the specific setting of advanced nurse practice in intensive care units or critical care units for adult patients (patients  $\geq 18$  years) in hospitals in European countries no matter the ICU level. Description of the ICU levels:

**Level I ICU (Regional):** Capable of providing immediate resuscitation and short-term cardio-respiratory support for critically ill patients, and also mechanical ventilation and simple invasive cardiovascular monitoring for several hours.

**Level II ICU (Metropolitan):** Capable of providing a high standard of general intensive care, including complex multi-system life-support, and may refer patients to designated tertiary hospital for specialty support (e.g. neurosurgery, cardiothoracic surgery).

**Level III ICU (Tertiary):** Tertiary referral unit for ICU patients offering comprehensive critical care and complex multi-system life-support

*Types of studies:* We will include all types of studies (whatever methodology used, except systematic reviews) describing, investigating or commenting on our research questions. We will include educational papers, curriculum, framework presentations, policy documents from governments, trade unions, nurse related organizations (FINE, ESNO, The International Nurse Practitioner/Advanced Practice Nursing Network). We will include literature in English, Danish, Swedish, and Norwegian. Search history will be documented (PRISMA flow diagram) giving possibility to reproduce the process (43).

*Databases:* A systematic literature search of peer-reviewed articles will be performed. Since the first group of nurse practitioners (NP) from the UK completed their education program in 1991, we will limit the literature search to 1992 – 2019 (ref <https://international.aanp.org/About/History>, accessed 190121).

Our data search is performed (1/16/2019) using the following databases: PubMed, OVID Embase, OVID PsycINFO, EBSCO CINAHL, Cochrane, SweMed, SCOPUS, ERIC, and SSCI. Likewise, relevant grey literature will be collected from networks on governmental websites, the websites of OECD, WHO, ICN, European Federation of ICUs, organizations, reference lists, and education institutions such as universities and colleges and hand search in reference lists. Search terms, search strategy, and in- and exclusion criteria are presented in Appendix C table 1.

*Data management:* Computer software Covidence will be used to assist with data management such as: identification of duplicates, screen imported studies and maintain structure of the process ([www.covidence.org](http://www.covidence.org)). We will use the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow chart to document our search (43).

### Stage 3: Study selection

The search strategy will be guided by the three-step method recommended in JBI systematic reviews (42). The first step is an initial limited search of at least two online databases relevant to the topic. We have chosen PubMed and Cinahl for this step. This initial search will be followed by an analysis of the text words contained in the title and abstract of retrieved papers, and of the index term terms used to describe the articles. A second search using all identified keywords and index terms will be undertaken across all included databases. Then a second search using identified keywords and index terms is carried out. Thirdly reference lists of all retrieved papers will be search for additional studies: If relevant we will contact authors to retrieve further information, if it is relevant. To start the screening process (GK, SN) will independently extract data from the first 20 studies using our data extraction tool and then meet to obtain consensus and determine if data are consistent with our research question and objectives (38). Two reviewers (GK, SN) will independently review all abstracts for inclusion.

#### Studies eligible for inclusion will meet the following criteria (Table 1):

1. including nurses with an advanced nursing practice education equivalent/corresponding to the individual country of reference in Europe
2. ANP working at an ICU with adult patients ( $\geq 18$  years)
3. describing skills and/or competencies required for an ANP
4. describing policies related to ANP

#### Studies will be excluded if they:

1. included a population of both basic nurses and/or intensive care nurses and ANP
2. from paediatric intensive care units
3. studies in anaesthesia or recovery units.

Before we initiate the full screening, we will make a random screening test in records retrieved in PubMed, to ensure reliability. We will have to have >80 % consent across reviewers. If this goal is not achieved, we will refine and adjust inclusion/exclusion criteria. Another random test will follow to ensure agreement and ensure reliability between reviewers. When the formal screening has started and in case of eligibility disagreements, the studies will be re-read and discussed with the opportunity to invite a third researcher



(SFH) to join the discussion and thereby gain consensus.

#### Stage 4: Charting the data

We will, inspired by Peters M DJ, 2015, develop a data extraction tool for reviewed studies. Results will be presented narrative and table format to map existing evidence. Extraction fields (Peters M DJ. 2015) (41).

- (1) Author(s)
- (2) Year of publication
- (3) Source origin/country of origin
- (4) Aims/purpose
- (5) Study population and sample size (if applicable)
- (6) Methodology
- (7) Intervention type and comparator (if applicable)
- (8) Concept
- (9) Duration of the intervention (if applicable)
- (10) How outcomes are measured
- (11) Key findings that relate to the review question

#### Stage 5: Collating, summarizing and reporting the results

An analytic framework and descriptive numerical summary analysis is used to provide overview of the results. Results and key findings will be presented in narrative form with figures and tables and we will attempt to compare and map the identified competencies and skills against EQF and ECVET. We will discuss our findings in relation to our objectives and implications for future research, ANP practice and policy related to ANP.

### Project organization Denmark

The INACTIC project is a 2- years (ERASMUS) EU+ funded project, managed by Professor Ruth Endacott in The Plymouth University, UK. Professor Ingrid Egerod has overall responsibility for the Danish work package (WP3). The review will be undertaken by the Danish team (GK, SN, SFH, TT, IE) with Gudrun Kaldan as projectleader.

### Time frame

October 2018 – January 2019 Protocol writing, development of search strategy, data search.

February 2019- April 2019 Screening, charting and collating data.

May -July 2019 Writing scoping review.

### Finances

The project is EU-funded. Details for the complete study are presented in the original INACTIC protocol.

### Publication

The Review protocol will be distributed to consortium members to advise on additional sources of evidence, particularly from grey literature and conference activity. Following completion of the Work Package, the protocol will be available via an open repository at the lead organization to enable the Review

to be replicated.

A proposed plan for presenting the results:

Results from the scoping review will be presented at national and international meetings and congresses (ESCIM) and published in peer reviewed journals. The order of the authors in the publication has been agreed upon and will be: Gudrun Kaldan, Sara Marie Juel Nordentoft, Suzanne Forsyth Herling, Anders Larsen, Thordis Thomsen, Ingrid Egerod, all according to the ICMJE rules.

## Appendix A

**PubMed, search terms: PubMed – 16-01-2019**

**PPC 1(PICO 1)**

Participants		Phenomenon of Interest	Context
#1	#2	#3	#4
Nurs*[tw]	Advanced[tw] Expert*[tw] Practitioner*[tw] Speciali*[tw]	Case-load*[tw] Caseload*[tw] Competenc*[tw] Curriculum*[tw] Education*[tw] Knowledge[tw] Legislation*[tw] "Policies"[tw] "Policy"[tw] Qualification*[tw] Skill*[tw]	"Critical care"[tw] "Critical nursing care"[tw] ICU[tw] "Intensive care"[tw] "Intensive nursing care"[tw]

#1 AND #2 AND #3 AND #4

Nurs\*[tw] AND (Advanced [tw] OR Expert\*[tw] OR Practitioner\*[tw] OR Speciali\*[tw]) AND (Case-load\*[tw] OR Caseload\*[tw] OR Competenc\*[tw] OR Curriculum\*[tw] OR Education\*[tw] OR Knowledge[tw] OR Legislation\*[tw] OR "Policies"[tw] OR "Policy"[tw] OR Qualification\*[tw] OR Skill\*[tw]) AND ("Critical care"[tw] OR "Critical nursing care"[tw] OR ICU[tw] OR "Intensive care"[tw] OR "Intensive nursing care"[tw])

= 1914

**PPC 2 (PICO 2)**

Participants		Phenomenon of Interest	Context
#1	#2	#3	#3
Advanced critical care practi*[tw] Advanced nursing practi*[tw] Advanced nurse practi*[tw] Advanced practice nurs*[tw] Expert critical care nurs*[tw] Nurse practitioner*[tw] Nurse specialist*[tw] Specialist nurs*[tw] Specialized nurs*[tw]	Case-load*[tw] Caseload*[tw] Competenc*[tw] Curriculum*[tw] Education*[tw] Knowledge[tw] Legislation*[tw] "Policies"[tw] "Policy"[tw] Qualification*[tw] Skill*[tw]	"Critical care"[tw] "Critical nursing care"[tw] ICU[tw] "Intensive care"[tw] "Intensive nursing care"[tw]	

## #1 AND #2 AND #3

(Advanced critical care practi\*[tw] OR Advanced nursing practi\*[tw] OR Advanced practice nurs\*[tw] OR Advanced nurse practi\*[tw] OR Expert critical care nurs\*[tw] OR Nurse practitioner\*[tw] OR Nurse specialist\*[tw] OR Specialist nurs\*[tw] OR Specialized nurs\*[tw]) AND (Case-load\*[tw] OR Caseload\*[tw] OR Competenc\*[tw] OR Curriculum\*[tw] OR Education\*[tw] OR Knowledge[tw] OR Legislation\*[tw] OR "Policies"[tw] OR "Policy"[tw] OR Qualification\*[tw] OR Skill\*[tw]) AND ("Critical care"[tw] OR "Critical nursing care"[tw] OR ICU[tw] OR "Intensive care"[tw] OR "Intensive nursing care"[tw])

= 596

**Summery**

PICo1 = 1914

PICo2 = 596

PICo1 OR PICo2 = 1923

**(PICo1 OR PICo2) AND ("1992/01/01"[pdat] : "2019/12/31"[pdat]) = 1775**

PICo1 NOT PICo2 = 1327

PICo2 NOT PICo1 = 9

## Text Words [TW]

Includes all words and numbers in the title, abstract, other abstract, MeSH terms, MeSH Subheadings, Publication Types, Substance Names, Personal Name as Subject, Corporate Author, Secondary Source, Comment/Correction Notes, and Other Terms (see Other Term [OT] above) typically non-MeSH subject terms (keywords), including NASA Space Flight Mission, assigned by an organization other than NLM.

[https://www.ncbi.nlm.nih.gov/books/NBK3827/#pubmedhelp.Text\\_Words\\_TW](https://www.ncbi.nlm.nih.gov/books/NBK3827/#pubmedhelp.Text_Words_TW)

## Appendix B

The overall aim of the INACTIC project is to develop an international set of competencies and education resources for Advanced Level Critical Care Nurses. The objective of the INACTIC project is to define the core competencies required of a nurse working at an advanced level in intensive care and to develop a curriculum from these competencies. Consensus methods will be used to enable interested stakeholders (ICU nurses, educators, patients and their relatives) from across Europe to identify and prioritise core competencies, which will be internationally applicable but able to accommodate local requirements. Following development of the competencies, they will be tested in a number of countries to determine applicability, feasibility and acceptability. A curriculum will be developed, based on the competencies, and a prototype educational resource will be developed from existing ESICM resources.

The original objectives of WP3 were:

1. To review the evidence related to skills and competency required for advanced level nursing in intensive care
2. To review the international evidence related to the impact of nursing interventions on patient outcomes in intensive care **(This objective will not be addressed)**
3. To review the policy related to advanced nursing practice across Europe

### Objectives for overall INACTIC project

1. Use consensus methods to develop a set of competencies required of an advanced level intensive care nurse.
2. Map these competencies against country-specific and multi-country competencies for advanced practice nursing.
3. Identify the feasibility and support the application of these competencies in a number of countries
4. Develop an outline curriculum based on the competencies, freely available online.
5. Map the competencies and curriculum against existing web-based curriculum resources for advanced practice nursing in intensive care.

In order to optimize social inclusion and mobility, the competencies will be mapped against EQF and ECVET. The project will be delivered through a series of 8 Work Packages, whereas present scoping review is work package 3 of 8 work packages (WP). WP1 will underpin the whole project. As the project brings together numerous partners comprising a multidisciplinary team, with a demanding work schedule and exacting time-frame, the main objective of WP1 is the effective management of the project. This will include: overall project management and reporting to the EC; daily management of project activities; resource allocation and monitoring; conflict resolution and corrective action. WP2 is central to the Project, as reflected in the resources allocated and the input from partners in this WP. In WP2 Competencies will be developed, using a three-round, online consensus process across 24 countries. At the same time a review of evidence and policy will be undertaken (WP3), the initial outcomes from which will feed into the second round of the WP2 consensus Delphi process. Following development of the competencies, these will be tested in WP4 to determine the applicability and feasibility of the competencies for individual countries. Content validity testing (using the Content Validity Index) will also be undertaken during this WP, to ensure individual competency statements have wide acceptability. A curriculum will be developed (WP5), mapped against existing resources (WP6) to enable the competencies to be used on completion of the Project. A prototype online educational resource (WP7) will be developed from existing ESICM resources.

## Appendix C

Table 1. Eligibility criteria for included and excluded studies

Inclusion criteria	Exclusion criteria
Studies reviewing the evidence that characterizes skills and competencies in advanced nursing practice (ANP) in intensive care units across Europe and studies describing the policy of the advanced nursing practice curriculum.	
Time: 1992 - 2019	Time: studies published before 1992
Language: Full text and abstract in English, Danish, Swedish or Norwegian	Language: Full text and abstract not in English, Danish, Swedish or Norwegian
Context: Europe	Context: Outside Europe or studies conducted in collaboration with countries in and outside Europe, where results from the European part is not feasible to extract
Setting: clinical studies conducted from intensive care units	Setting: clinical studies conducted from pediatric intensive care units
Participants/population: <ul style="list-style-type: none"> <li>• Nurses with an advanced level nursing education equivalent/corresponding to the individual country of reference, regardless of sex and age <ul style="list-style-type: none"> <li>○ Advanced nurse practitioner</li> </ul> </li> </ul>	Participants/population: <ul style="list-style-type: none"> <li>• A population of both nurse/anesthesia/intensive care nurse and ANP nurses were excluded if extraction of the ANP population is not feasible</li> <li>• ANP working at an ICU for patients of all age</li> </ul>

<ul style="list-style-type: none"> <li>○ Advanced critical care practitioner</li> <li>○ Advanced practice nurse</li> <li>○ Nurse practitioner</li> <li>○ Critical nurse specialist</li> <li>○ Nurse specialist</li> <li>● ANP nurse working at an ICU with patients ≥ 18 years</li> </ul>	
<p>Study design:</p> <p>All</p> <ul style="list-style-type: none"> <li>- Qualitative design</li> <li>- Interview (focus group interviews, semi structured interviews, in-depth interviews)</li> <li>- Quantitative design <ul style="list-style-type: none"> <li>- Experimental designs (randomized controlled trails)</li> <li>- Observational designs (descriptive studies, surveys, cross-sectional studies, patient-reported outcome studies, case studies)</li> </ul> </li> <li>- Mixed methods studies</li> <li>- Gray literature <ul style="list-style-type: none"> <li>- Policies of ANP from individual countries</li> <li>- Curriculum of ANP from individual countries</li> <li>- Local guidelines for ANP</li> </ul> </li> <li>- Policy documents from governments, trade unions or nurse related organizations</li> <li>- Mails from members of the EfCCNa organization to clarify gaps/questions</li> <li>- Reference lists of relevant literature</li> <li>- Hand search literature</li> <li>- Study protocol</li> <li>- Conference abstracts of unpublished studies</li> <li>- Systematic reviews with or without metaanalysis or meta-synthesis</li> </ul>	<p>Study design:</p>

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