



## Review

## Anaesthesia nursing education in the Nordic countries: Literature review

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## SUMMARY

**Objectives:** The purpose of this review was to analyse post-registration anaesthesia nursing education in the Nordic countries. The analysis was based on key determinants fundamental to analysing nursing education: 1) the system of anaesthesia nursing education, 2) entry requirements, 3) credits, the duration and the title or degree awarded, and 4) the amount of practical training.

**Methods:** A scoping review was approached in a systematic manner. The literature was analysed using deductive content analysis. Data was gathered based on key determinants. The data were quantified into frequencies and percentages to compare the similarities and differences of anaesthesia nursing.

**Results:** The Nordic countries have different types of post-registration anaesthesia nursing education from non-degree supplementary programmes to Master's degree programmes. Even though the entry requirements correspond between countries, many more differences than similarities in anaesthesia nursing education were noted. A title granting the right to work as a nurse anaesthetist can be obtained through a variety of educational systems, credit requirements, the duration, and the amount of practical training in post-registration anaesthesia nursing programmes.

**Conclusion:** This aim of the study was to analyse post-registration anaesthesia nursing education from the Nordic perspective. Harmonising the educational system and minimum education requirements in anaesthesia nursing education is recommended in order to facilitate free movement and assure the quality of care from the Nordic perspective. Since each Nordic country has its own native language, it was difficult to gather information from all the Nordic countries. Therefore, creating common educational database published in English can help to benchmark each country's educational system.

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## Introduction

During the last two decades, European nursing education has been undergoing a process of reform in order to ensure a comparable and coherent system; a process that has been influenced by the Bologna process—the European Higher Education Area (EHEA) (Collins and Hewer, 2014; Davies, 2008; EU Directive, 2005/36/EC; EU Directive, 2013/55/EU; Kajander-Unkuri et al., 2013; Lahtinen et al., 2014; Zabalegui et al., 2006). Along with the educational reforms, the health care services have been searching for creative strategies that will improve quality, minimise costs and increase patient and family satisfaction (Duffield et al., 2009; Sipe et al., 2009).

As member countries of the EHEA, the Nordic countries have been undergoing changes and reforms in nursing education that give advanced roles to nurses, and one of the most important nursing fields is anaesthesia nursing care (Halbeis et al., 2007). Anaesthesia nursing care is connected not only with surgical procedures but also to a variety

of settings such as diagnostic and therapeutic procedures, as well as pain management at all acuity levels over the lifespan (AANA, 2013; Haas, 2013; Plaus et al., 2011). In order to fulfil the complex needs of patients undergoing surgery and anaesthesia, nurses require a well-developed knowledge and special skills in both the technical and the caring dimensions of anaesthesia nursing (Hamric and Hanson, 2003; ICN, 2005; WHO, 2003). Since the impact of specially educated nurses for anaesthesia care is significantly effective from the perspective of quality of care and cost effectiveness (Hogan et al., 2010), most of the Nordic countries offer post-registration anaesthesia nursing education (Meeusen et al., 2010).

In the Nordic countries, the similarities with the cultural, social, and political environment including coherent health care systems enable nurses to move from one Nordic country to another. However, heterogeneity and the variety of nursing education systems in anaesthesia nursing care hinder nurses moving between the Nordic countries (Råholm et al., 2010). The Nordic Council of Ministers has been eradicating all barriers for Nordic mobility through higher education (Fägerlind and Strömqvist, 2004) as well as encouraging major collaboration in matters of quality assurance among the Nordic countries (Nordic Council of Ministers, 2011). Therefore, it is necessary to ensure an

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education giving a professional qualification in anaesthesia care in order to facilitate free movement, harmonisation of the minimum education requirements, and assuring quality of care from the Nordic perspective.

The purpose of this review was to analyse post-registration anaesthesia nursing education in the Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden). Anaesthesia nursing education was analysed based on key determinants fundamental when analysing the implementation of nursing education: 1) a system of anaesthesia nursing education, 2) entry requirements, 3) the credits, duration, and the title or degree awarded, as well as 4) the amount of practical training. These determinants were analysed in order to describe the similarities and differences in anaesthesia nursing education among the Nordic countries.

Currently there is no common database containing this information and no comparison studies on anaesthesia nursing education. This review, therefore, provides essential information on the implementation of the Nordic anaesthesia nursing education as well as European nursing education.

## Background

Nurses providing anaesthesia care can be classified into two types on the basis of their educational level: *anaesthesia nurses* and *nurse anaesthetists*. An *anaesthesia nurse* refers to a registered nurse who has undergone additional training in an anaesthesia department at a hospital. The anaesthesia nurse assists the anaesthesiologists and has competence to prepare, maintain, and monitor anaesthetized patients (Ministry of Education and Culture, 2006; ANIVA and SSF, 2008). A *nurse anaesthetist* means a registered nurse who has acquired post-registration education and trained for anaesthesia care (ANIVA and SSF, 2008; Ministry of Education and Research, 2005; Meeusen et al., 2010). All Nordic countries except Finland have endorsed the fact that nurses in anaesthesia care require the completion of specialist anaesthesia nursing education to provide anaesthesia nursing care (McGarvey et al., 2000). Nurse anaesthetists are allowed to independently induce general anaesthesia for ASA (the American Society of Anaesthesiologists) I and II patient groups, according to specified anaesthesia care team's protocols and terms (Averlid and Axelsson, 2012).

In the Nordic countries, anaesthesia care is provided by a team model consisting of anaesthesia nurses/nurse anaesthetists and anaesthesiologists (Søreide et al., 2010). A sufficient number of anaesthesia care teams are important in order to perform safe care for surgical patients (Halbeis et al., 2007; Hogan et al., 2010). Sweden has the highest number of nurse anaesthetists, while Iceland has the lowest. Finland has the highest population that is taken care of by anaesthesia team members (Table 1). This denotes that Finland has a relatively higher shortage of anaesthesia care teams than other Nordic countries (Vakkuri et al., 2006).

The Nordic countries have had strong co-operation in many sectors including the education field (Råholm et al., 2010). The student and faculty exchange programme called NORDPLUS has contributed to increased mobility within the Nordic region throughout the various research training and cooperation schemes (Fägerlind and Strömqvist, 2004). The Nordic Network for Nurse Anaesthetist Education (NORDANNET) financed by funds from NORDPLUS was established

to promote nurse anaesthetist students, teachers, and instructors' exchange to facilitate learning about new methods and approaches for anaesthesia care (Snorrason, 2011). In the NORDANNET cooperation, seven universities and hospitals in the Nordic countries are connected as bridges from the academic perspective. However, despite these networks, different anaesthesia nursing education among the Nordic countries has limited the goal of the cooperation and free mobility being realised (Fägerlind and Strömqvist, 2004).

## Search Method

Given the lack of existing data analysing post-registration anaesthesia nursing education from the Nordic perspective, a scoping review was undertaken in a systematic manner. A scoping review aims to map rapidly the key concepts in a research area and involves systematic selection, collection, and summaries of existing knowledge to provide an overview of the type and quantity of research available on a given topic (Aveyard, 2010; Wilson et al., 2012).

This scoping review has three data sources: research articles, internet databases, and websites related to anaesthesia nursing in the Nordic countries. A search for research articles through CINAHL and MEDLINE databases was conducted in June 2014 by using the keywords: anaesthesia nurse, nurse anaesthetists, specialist anaesthesia nurse, nursing education, regulation, programme, degree, curriculum, syllabus, Scandinavia, Nordic, Denmark, Finland, Iceland, Norway, and Sweden.

The inclusion criteria were as follows: i) studies from any Nordic countries describing systems of post-registration anaesthesia nursing education, ii) European and global perspective studies containing the Nordic countries, and iii) methodology of literature reviews, commentary/editorial, or empirical studies. There were no time and language limitations for the search. The search terms were in English and a full-text was available. Exclusion criteria were: i) studies addressing countries outside of the Nordic countries (such as Australia, USA, or European studies without the Nordic countries), ii) studies focusing on specialist education in fields other than anaesthesia nursing (such as intensive care or emergency), and iii) studies focusing only on general nursing education or general nursing students.

The total number of hits from CINAHL (431) and MEDLINE (838) databases was 1271 including 2 manual references. Based on the inclusion criteria, 157 references were chosen from the title screening. From the reviewing abstracts, 113 references were excluded. During the abstract reviewing process, references were marked as one of three, 'include', 'unclear', and 'exclude' and the full-text for any classification as the former two groups were retrieved to determine study eligibility. In all, 44 articles were assessed as relevant based on the inclusion criteria. After reviewing the full-text, 28 references were excluded because: they only focused on general nursing education (7), they were in other fields of advanced nursing (10), and they were outside of the Nordic countries (11). The full-text review was conducted with a coding framework including the country focus, the type of literature, and key findings. In this review process, two researchers independently assessed relevancy based on the inclusion criteria and disagreements were resolved by discussion. A total of 16 articles met the selection criteria and were included in the analysis (Fig. 1).

**Table 1**  
Population and anaesthesia care team members in the Nordic countries.

	Denmark	Finland	Iceland	Norway	Sweden
a. Population in January 2014 <sup>e</sup>	5,225,283	5,452,821	325,671	5,109,056	9,651,531
b. Anaesthesiologist in January 2014 <sup>f</sup> (a/b)	970 (5386)	806 (6765)	53 (6144)	847 (6031)	1588 (6077)
c. Nurse anaesthetist or anaesthesia nurse <sup>g</sup> (a/c)	1750 (2985)	1600 (3408)	93 (3501)	1535 (3328)	4000 (2412)
d. Anaesthesia team members (a/d)	2720 (1921)	2406 (2266)	146 (2230)	2382 (2145)	5588 (1727)

<sup>e</sup> Population data obtained from Statistics in Denmark, Finland, Iceland, Norway and Sweden Statistics Norway (2014).

<sup>f</sup> SNAPS (2014).

<sup>g</sup> Data from Association of Nurse Anaesthetist in Denmark, Finland, Iceland, Norway and Sweden.

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